

Video	Audio
	<p>>>Male Narrator: Weather affects all our lives, especially if you like to spend time in the great outdoors. Join Georgia Outdoors as we explore both the good and bad weather conditions that shape our environment. We'll learn where forecasts come from, how to stay safe in extreme weather and how people survive the worst weather Georgia has seen. Coming up next!</p>
	<p>>>Narrator: It has been said that nine out of ten of us couldn't start a conversation without the weather. It is not often that a day goes by when the weather doesn't affect our daily lives in a more profound way, good or bad...and in Georgia we have plenty of both! A nice day can draw us outside to bask in the sun and enjoy our state's beaches, parks and green spaces. An unpleasant day can send us inside to bask in the glow of the TV, keeping warm and dry and of course watching Georgia Outdoors. And a day of severe weather can change our lives forever.</p> <p>As surely as birds fly south for the winter, so too are we affected by weather. Weather is the single most pervasive force on our environment.</p>
	<p>Weather is a reminder that the earth is a dynamic, living organism that is always in the midst of change.</p>
	<p>Defined as the state of the atmosphere at a given time and place, described by variables such as temperature, moisture, wind and barometric pressure, the term "weather" encompasses every configuration...whether that adds up to a nice day outside or not.</p>

	<p>Most often when we think of weather, we think of severe weather, and because Georgia's located in the southeastern region of the United States, our state is susceptible to all sorts of severe weather phenomenon.</p>
	<p>>>Rothfusz: The state of Georgia has numerous types of weather situations that we have to be aware of. We are the largest state east of the Mississippi River therefore we have lots of different weather that can occur within that large area.</p>
	<p>>>Narrator: For the modern public, accessing the daily weather forecast is as easy as turning on the TV or radio, or logging onto the internet, but it wasn't always so easy.</p> <p>Weather forecasting or meteorology has roots that reach back to the beginnings of recorded history when in 400 BC Aristotle wrote the first major study of meteorology. The 1894 US Congress created the Weather Bureau. Over the next century it would become what we know now as The National Weather Service. It is also in the last century that meteorology has taken great strides as a science.</p>
	<p>>>Rothfusz: The National Weather Service is a federal agency, and as a federal agency we have a mission to provide public service. We do this through our forecasts and our warnings, and we do that with the taxpayers' dollars to ensure that everybody gets fair benefit from that.</p>
	<p>>>Narrator: Of course, even the National Weather Service gets that information wrong sometimes.</p>
	<p>>>Rothfusz: Being a meteorologist you have to have a thick hide on your skin because the nature of forecasting and the nature of meteorology is that it is an infant science. We're still learning a lot. There is still a lot we do not know about the field of meteorology, the science of meteorology. So as a result, we have to employ a little bit of art to our to our practice. Now the models are getting better, our computer simulations are getting better, and as a result, our forecasts</p>

	<p>are getting better and better and our skill is improving. The difficult thing in our profession is that nobody remembers the good forecasts, the ones that you hit all the time, and we are quite good at our forecasts, a high percentage of success rates. The problem is they remember the ones that you missed.</p>
	<p>>>Narrator: There are 121 National Weather Service Forecast offices in the United States. Six forecast offices are responsible for servicing Georgia, the largest portion of which is serviced by the office in Peachtree City.</p> <p>The meteorologists here use many different tools in compiling the data, which determines today's weather forecast. Some have been used for over a century like releasing weather balloons and collecting reports from real live people.</p>
	<p>>>Rothfusz: A severe weather spotter is somebody who has been trained by the National Weather Service. They are usually working in coordination with local emergency managers. And they are coordinated by those emergency managers and activated by the emergency managers to go out into their county or into their jurisdiction and watch these storms as they come in.</p>
	<p>>>Narrator: But the bulk of the meteorologist's job is done at a computer, or rather, many, many computers. These computers are also a major tool in getting a severe weather warning out to the public.</p>
	<p>>>Rothfusz: Well the day is continuous at the National Weather Service. We have 24-hour coverage. We have at least a meteorologist on at any given time. As new information comes in for the forecaster, they are continually evaluating that information and deciding if the existing forecast needs to be updated. Now on days when there's a lot of severe weather or anticipating severe weather in terms of tornadoes or severe thunderstorms or winter storms and that sort of thing, we will be ramping up our staffing and making sure that we have all the positions covered. So basically two different modes of operation in the National Weather Service office.</p>
	<p>>>Narrator: Today the temperatures are staring to drop rapidly, so much so that the forecasters here have decided to upgrade a winter weather advisory to an ice storm</p>

	warning.
	>>Noel: It's actually very easy for us to go ahead and upgrade to a ice storm warning. >> Narrator: Issuing severe weather warnings and disseminating that warning to the public is one of the primary missions of the National Weather Service.
	>>Rothfusz: There are a number of different ways the National Weather Service provides its forecasts and its warnings to the public...One way is through the weather radio...We have the means within this office to put our information directly onto a weather radio broadcast, so it's an immediate connection to the listeners of weather radio from us in the National Weather Service office directly to them. >>Noel: And then once that product is sent out it'll turn red on our screen so our forecasters here in our office will always see this warning in effect. >>Rothfusz: Another direction that we take is through the media. We are vitally dependent upon the media to take our information and carry that out to the public. >>Ossman: So a situation like this, you get that warning that you heard beep, and now they're bringing it to an ice storm warning in effect for Wednesday, Wednesday night for parts of North Georgia.
	>> Narrator: Paul Ossmann is the Weather Anchor for Atlanta's NBC affiliate. Television is one the most immediate and popular ways to learn about a weather advisory, and when a watch becomes a warning, this is big news...
	>>Ossman: Ice storm warning. I've got 16 seconds to explain it. I think people really pay attention to the weather. It's the number one reason why people tune to local news. And just look at what's happened in these past two days. Today it's 55, 60 degrees. Tomorrow we're talking about a winter storm. It just changes so quickly this time of year, especially in Atlanta. Atlanta is the second highest elevated major city in the United States. You get all this information together and you think you know it, and all of the sudden it either happens or it doesn't happen. And you can't control it. That's what makes it so interesting. You try to harness it, but you never can control it. >>: Ice storm warning in effect for all of north Georgia including the city of Atlanta as the moisture begins to move in and the colder air is rushing in as well. We'll tell you about all the possibilities, the latest on the watches and warnings and when the ice will get here, coming your way at 5.
	>> Female Narrator: Clouds play a large role in our environment. The ability to identify clouds can be quite helpful when planning your day. Clouds are classified by their shape and their level in the atmosphere. There are four cloud shapes: Cirrus clouds, which are curly and wispy; stratus clouds, which are flat and layered; cumulus clouds, which are

	<p>puffy and piled up; and nimbus clouds, which generate rain. Clouds occur in three levels of the atmosphere, so with 4 cloud shapes and 3 atmospheric levels, we come up with 12 major cloud types. Visit this website to learn more about identifying clouds.</p>
	<p>>>Male Narrator: When winter weather in Georgia gets serious, even the experts get help from the experts at the Weather Channel. Based in Atlanta, the Weather Channel has many severe weather experts. They have to; their coverage area is not just Georgia or the United States, but the entire globe. If Paul Ossman can call on the big guns, then so can we.</p> <p>Winter officially begins on December 22 each year. This is called the Winter Solstice, or the day when the sun rises to its highest point above the Tropic of Capricorn. But down here on Earth, meteorologists define the first day of winter as the day on which air temperatures drop to a consistent 32 degrees Fahrenheit. And with freezing temperatures comes snow, sleet and ice storms.</p>
	<p>>>Kocin: Georgia is not a really winter weather kind of place. Winter weather events occur, but they're rare, which means that when they do occur, they have a tremendous amount of impact. For instance, 2 inches of snow in Minneapolis, not a problem; 2 inches of snow in Atlanta is a big problem</p>
	<p>>>Narrator: Snow is defined as frozen water vapor originating in the upper atmosphere.</p> <p>>>Kocin: Snow is not really the main problem in Georgia. It's probably more freezing rain and ice storms. Freezing rain is snow that melts completely into rain. It does not refreeze before it hits the ground, but when it hits the ground,</p>

	<p>that's when it freezes. Ice has got the biggest reputation for being potentially the most crippling of the winter weather phenomenon.</p> <p>>>Narrator: Winter storms are considered deceptive killers because most deaths are indirectly related to the storm. The leading cause of death due to winter weather is auto accidents. Because winter weather is relatively rare in the southeast, when it does occur, it's a well-remembered event.</p> <p>>>Kocin: One was in January of 2000 where we had about an inch and a half of rain over night here in Atlanta, much of which fell as freezing rain. So most people woke up in the morning, the power had failed, the roads were treacherous not only because there was a little bit of ice even on the bridges and overpasses, but a lot of trees and limbs had fallen onto the roads. That took a long time to really clean up and was a very serious incident.</p>
	<p>>>Narrator: A storm is any kind of weather disturbance that brings with it unpleasant or even violent atmospheric conditions. And the thunderstorm is the most frequent event in this category. At any given time, there are nearly 1800 thunderstorms taking place on Earth.</p>
	<p>>>Forbes: What we're looking for are conditions that are unstable, that means lots of warm, moist air at low levels topped by cooler, dryer air. That combination of vertical temperature change and vertical moisture change makes for the instability that allows for thunderstorms to develop and become severe.</p> <p>>>Narrator: Thunderstorms occur most frequently during the warmer months of the year. South Georgia is more likely to host a thunderstorm than other parts of the state because here the Atlantic and Gulf airstreams converge. While this type of storm may be the namesake of thunder...</p> <p>>>Forbes: Lightning is the essence of thunderstorms. The lightning passes as a current through the air in a width only about as wide as your finger. That column of air heats up explosively and causes shock and sound waves that we hear as the thunder in thunderstorms.</p> <p>>>Narrator: Scientists believe that lightning has played an explosive part in the evolution of living things. For instance we also know that lightning is an integral part of many ecosystems such as the longleaf pine forest that once covered much of Georgia. Lightning strikes would cause ground fires, and before Smokey the Bear, these fires would move through the longleaf pine forest quickly, burning understory growth. This allowed the sun to reach the forest floor. Some plants like wiregrass have even evolved in such a way that they can only propagate with the aide of fire. Thunderstorms have been called weather factories because they produce such great variety of weather phenomenon, another of which is hail.</p> <p>>>Kocin: Hail occurs primarily during the summer when it's basically very warm and the reason we get hail in the summer is that during the summer thunderstorms, air rises very, very rapidly, which allows ice that develops up in clouds. They just grow and grow and grow and finally when they get to be large enough, they'll fall to the ground.</p> <p>>>Narrator: Another powerful and destructive byproduct of a thunderstorm is tomadoes.</p>

	<p>Georgia may be just as likely to suffer tomado as the rest of the eastern US, but Georgia is one of just a dozen states along the Atlantic and Gulf of Mexico coastlines. This makes our state very vulnerable to tropical storms and hurricanes.</p> <p>>>Lyons: A lot of people think the Georgia coast is immune to tropical cyclones because it's sort of built in there. Florida sticks a little more and of course the Carolinas move way out toward the east but it's just takes the right landfall and hurricane direction to get Georgia, and in the late 1800s we saw quite a few of those.</p> <p>>>Narrator: The last hurricane to make landfall over Georgia was in 1898 before they gave hurricanes names, but in 1999, almost exactly one hundred years later, Hurricane Floyd came close. A hurricane is just one of four types of tropical events. The least powerful is a...</p> <p>>>Lyons:... a tropical disturbance. Then we go to tropical depression, which is a little more potent. Usually the winds are less than 35 miles per hour. Then we go to tropical storm where the winds are 35 miles per hour, all the way up to 73 miles per hour. Then comes the hurricane, that's 74 miles per hour or higher. And within the hurricane range we have Category 1, 2, 3, 4 and 5. Five is the strongest. That has winds greater then 155 miles per hour. We've only had three of those hit the United States in our historical record.</p>
	<p>>>Narrator: The National Weather service started naming tropical events in 1953 using all female names. In 1979 they added men's names. There are 6 lists of names for each letter of the alphabet used and these lists rotate every 6 years unless a name is given to a particularly deadly or costly storm. In that case the name is retired.</p> <p>>>Lyons: In an average year we get about ten name storms. Ten tropical storms of which six become hurricanes and two become major hurricanes.</p>
	<p>>>Narrator: Though measurement of wind speed is the method meteorologists use to categorize tropical events, wind is surprisingly the least likely element of a hurricane to kill you.</p> <p>>>Lyons: Very few people die of wind. Even people that basically are hunkered down in a house that's been destroyed survive basically unscathed or with just a scratch or two on them.</p> <p>>>Narrator: What is more deadly is flooding, and that is caused by two elements in a tropical event, large amounts of rain and storm surge. Storm surge is the inundation of water pushed toward the shore by the force of the wind swirling around the storm. The damage a storm surge produces is determined by the slope of the continental shelf.</p> <p>>>Lyons: The Georgia coastline is one of the most vulnerable to surge. It's extremely shallow sloping coastline and so the surge is much higher for the same hurricane in Georgia than it would be in many other locations.</p> <p>>>Narrator: People who live inland from the coast may think that they're safe from the effects of tropical storms. But in 1994 Georgia learned just how at-risk they may be.</p> <p>>>Lyons: Tropical storm Alberto made landfall on the Florida panhandle coast</p>

	<p>and started to move inland and sat over southwestern Georgia and Alabama and dumped tremendous amounts of rain. 27.61 inches as a matter of fact, 21 of those inches fell within 24 hours. What continues to be so bad about flooding is that the event occurs for maybe a day or so, but the rivers continue to swell as the water drains into them. The flooding over the rivers continued for almost three weeks afterward.</p> <p>>>Narrator: When a weather event requires disaster relief, there's one Georgia agency that coordinates the effort.</p> <p>>>McConnell: Georgia Emergency Management is part of the governor's office. We are responsible for a wide variety of events. Anything that takes more than two state agencies to respond, we're involved in response of that. The majority of the big events are due to weather. Most of us in Georgia remember the 1994 floods. There was 55 counties from Atlanta to the Florida line and southwest GA, killed 34 people, cost approximately \$500 million to recover from. The Albany, Georgia area was certainly devastated during that time. Since 1990 all but 5 of Georgia counties have been stricken by weather related disasters that were beyond their capability. All those were declared federally.</p> <p>>>Narrator: Following the flood of 1994 a more quiet but still severe weather situation would seize Georgia, drought. Since 1998, Georgia has been plagued with a long-term drought. Drought is measured using 5 indicators: rainfall, soil moisture, stream flows, lake levels and ground water level.</p>
	<p>>>Nicholson: There are many different cycles in nature that ebeflow, short term cycles like droughts and wet periods within a growing season, and then the extended dry periods like we appear to be under now in Georgia and the Southeast. As we go year after year with decreased rainfall then those impacts become more accumulated.</p>
	<p>>>Narrator: As we've seen, severe weather can come in many forms and can cause widespread devastation. Whether it's the jolt of several million volts of electricity or 200 mile per hour winds, we share the responsibility to help minimize the damage and loss of life that severe weather events can produce, and we can do this by being prepared. The number one precaution measure on every expert's list is the weather radio.</p>
	<p>>>Rothfus: Every house by law has to have a smoke detector in the home. The weather radio is much like a weather detector in the home. When there is threatening weather, there is a little sensor inside that weather box that when we push a button that sends a signal across the radio waves to that radio to turn on and to sound an alarm inside your home much like a smoke detector sounds in your home.</p> <p>>>Forbes: We can have perfect warnings, but if nobody is listening to them, then people didn't get the warning. But no a weather radio with tone alert will beep when there is a tornado or a severe thunderstorm warning for their region, especially even their county. These days it can be really fine-tuned.</p> <p>>>Narrator: There are many other factors to consider when faced with severe weather. Visit our website to learn more about what you should do to keep you and your family safe. Weather is more mysterious than many other aspects of nature. Much of what constitutes weather is invisible, capable of being identified only by</p>

	<p>sophisticated equipment. And there's so many factors that make up our environment and effect the weather that we could not include all of them in this program. Weather watching is increasing in popularity so there's no need to travel to the seashore or to the forest or to the countryside. You only need to step outdoors to feel it, see it, experience it.</p>
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