

1

00:00:00,000 --> 00:00:08,000

They are born in chaos and they bring death and destruction to our earth.

2

00:00:08,000 --> 00:00:15,000

We'd looked across the street from us and there was total devastation. It looked like a bomb had been dropped.

3

00:00:15,000 --> 00:00:22,000

They rip a path through the heavens and tear apart the fabric of our lives.

4

00:00:22,000 --> 00:00:28,000

The neighbors all gathered at my house because ours was the only house left.

5

00:00:29,000 --> 00:00:34,000

Their nature at its most terrifying. They are tornadoes.

6

00:00:46,000 --> 00:00:51,000

Beyond what is known by the unexplored world is shadows and phantoms.

7

00:00:51,000 --> 00:00:58,000

A land that knows no limits of time or space.

8

00:01:03,000 --> 00:01:11,000

From the dawn of discovery to the nightfall of catastrophe, journey through a universe of the unexplained.

9

00:01:11,000 --> 00:01:15,000

The unforeseen, the unbelievable.

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00:01:16,000 --> 00:01:21,000

A place beyond reality where no question will go unanswered.

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00:01:21,000 --> 00:01:27,000

A place where myths and legends are all superstition of science.

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00:01:46,000 --> 00:01:52,000

It's time for our journey to begin.

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00:01:57,000 --> 00:02:01,000

To a hole in fury and to no regard for the works of man.

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00:02:04,000 --> 00:02:06,000

Tornadoes.

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00:02:07,000 --> 00:02:09,000

Tornadoes.

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00:02:12,000 --> 00:02:18,000

Knowledge surrounds these library walls and with these instruments that knowledge can be ours.

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00:02:29,000 --> 00:02:34,000

Man has dedicated much time to exploiting and confining nature.

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00:02:35,000 --> 00:02:42,000

But nature can fight back fiercely and there are few forces in nature as savage as a tornado.

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00:02:42,000 --> 00:02:46,000

Is man helpless in the face of such wind driven rage?

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00:02:46,000 --> 00:02:51,000

We need to take a closer look at one of those terrible winds.

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00:02:57,000 --> 00:03:01,000

It was a foregone conclusion that we were going to die.

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00:03:01,000 --> 00:03:04,000

It was just a matter of waiting for the exact moment.

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00:03:04,000 --> 00:03:10,000

I can remember holding my family together in the bathroom and praying to be saved.

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00:03:10,000 --> 00:03:15,000

As I was moving through the house I could already hear windows breaking.

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00:03:15,000 --> 00:03:20,000

I started talking to God about whether or not I was going to make it through this experience.

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00:03:22,000 --> 00:03:28,000

There's nothing on earth to compare to the sight and sound of this storm creature as it punches upon its helpless victims.

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00:03:29,000 --> 00:03:35,000

People will tell you that when they sound like a train and they do, it sounds like it's going right through your home.

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00:03:35,000 --> 00:03:41,000

The sounds were so intense, the glass breaking, the 2x4 is just snapping.

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00:03:41,000 --> 00:03:45,000

And you realize that your house is coming apart and you're just absolutely helpless.

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00:03:45,000 --> 00:03:50,000

You could hear things breaking, cracking, windows breaking, things hitting the house.

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00:03:50,000 --> 00:03:54,000

And we weren't sure when we opened the door to the bathroom what we would find.

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00:03:54,000 --> 00:03:58,000

These people have lived through a terror that descended from the heavens.

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00:03:58,000 --> 00:04:03,000

They have experienced a tornado, an ordeal that has blown lives apart for centuries.

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00:04:06,000 --> 00:04:11,000

In the years of the great American plains, feared and respected tornadoes,

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00:04:11,000 --> 00:04:16,000

they believed that they could drive them from their villages with this.

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00:04:17,000 --> 00:04:23,000

With the first sign of a tornado, they would take an axe, swing it over their heads,

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00:04:23,000 --> 00:04:28,000

and that buried by the handle with the blade facing the menace.

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00:04:28,000 --> 00:04:34,000

According to legend, the storm would split in two, leaving the Indians in peace.

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00:04:36,000 --> 00:04:40,000

In the intervening centuries, our scientific knowledge has grown,

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00:04:40,000 --> 00:04:43,000

but our ability to fight back has remained the same.

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00:04:44,000 --> 00:04:49,000

Tornadoes sometimes touch down for just a matter of seconds.

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00:04:49,000 --> 00:04:54,000

The tornado may destroy one or two houses and then lift right up,

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00:04:54,000 --> 00:04:58,000

leaving the house right next to it, completely undamaged.

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00:05:05,000 --> 00:05:09,000

The word tornado comes from the Latin word torne, meaning turn.

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00:05:10,000 --> 00:05:15,000

And the erratic paths they take are only one of the more terrifying things about them.

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00:05:18,000 --> 00:05:22,000

This tornado appeared in Minnesota, in the north-central United States,

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00:05:22,000 --> 00:05:28,000

and amazingly enough, a helicopter was in the vicinity with a very brave pilot and cameraman on board.

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00:05:28,000 --> 00:05:34,000

And they captured one of these turning winds in this spectacular footage.

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00:05:35,000 --> 00:05:42,000

These winds can exceed 200 miles an hour, and they lay waste to everything in their path.

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00:05:42,000 --> 00:05:45,000

Fortunately, in this case, the tornado appeared over a forest,

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00:05:45,000 --> 00:05:50,000

and the only damage was to some power lines that were flattened like matchsticks.

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00:05:53,000 --> 00:05:57,000

The mindless malevolence of tornadoes makes them difficult to predict.

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00:05:57,000 --> 00:06:01,000

We do know that the United States suffers more damage than any other nation,

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00:06:01,000 --> 00:06:05,000

with an average 850 tornadoes a year.

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00:06:05,000 --> 00:06:08,000

And that is in a good year.

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00:06:11,000 --> 00:06:17,000

Tornado appearances are known as outbreaks, and most take place between February and May.

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00:06:17,000 --> 00:06:25,000

The frightening thing is that the death toll was as great in the last great outbreak of 1974 as it was in 1884.

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00:06:26,000 --> 00:06:31,000

Modern science seems helpless in the face of something so precious,

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00:06:31,000 --> 00:06:35,000

something that seems to appear and disappear almost at will.

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00:06:46,000 --> 00:06:50,000

On the average, something around 100 people a year are killed by tornadoes.

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00:06:50,000 --> 00:06:53,000

Tornadoes come in many shapes and sizes,

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00:06:53,000 --> 00:06:56,000

and we can reproduce all those in our laboratory model.

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00:06:56,000 --> 00:07:04,000

That's one of the advantages of the laboratory model, in that one can reproduce time and again the same airflow.

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00:07:04,000 --> 00:07:12,000

At Purdue University in the United States, Dr. John Snow recreates tornadoes in this special chamber,

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00:07:12,000 --> 00:07:15,000

paying close attention to their destructiveness.

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00:07:15,000 --> 00:07:21,000

Most people who are hurt by tornadoes are hurt indirectly through flying debris.

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00:07:21,000 --> 00:07:25,000

In a similar study conducted in the Tornado-prone state of Texas,

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00:07:25,000 --> 00:07:33,000

researchers have attempted to duplicate the effects of these winds on a simple piece of wood blown into the slab of thick concrete.

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00:07:33,000 --> 00:07:40,000

A chilling example of what a tornado can do took place in April of 1974.

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00:07:40,000 --> 00:07:47,000

In a two-day period, 148 of these terrible winds descended on the east-central United States.

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00:07:47,000 --> 00:07:53,000

In the early 1970s, the tornadoes were destroyed by the Tornado-prone.

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00:07:53,000 --> 00:07:57,000

The tornadoes were destroyed by the Tornado-prone.

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00:07:57,000 --> 00:08:04,000

In a two-day period, 148 of these terrible winds descended on the east-central United States.

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00:08:04,000 --> 00:08:12,000

In the space of 16 hours, they killed 315 people and injured another 6,000.

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00:08:20,000 --> 00:08:24,000

In a 36-hour period, there were some 140 tornadoes produced.

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00:08:24,000 --> 00:08:31,000

This was a tornado outbreak, and that particular one was the strongest outbreak we know of in recorded history.

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00:08:31,000 --> 00:08:35,000

This is an example of one of those violent types of tornadoes.

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00:08:35,000 --> 00:08:41,000

It's very large, very powerful, probably having wind speeds approaching 300 miles an hour.

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00:08:41,000 --> 00:08:44,000

As a result, it just demolishes everything in its path.

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00:08:45,000 --> 00:08:51,000

It's almost as if man is being punished for presuming that he can control nature.

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00:08:51,000 --> 00:09:00,000

Now that we've seen what these brutal storms can do, is there a way to fight them to push these terrible winds from the sky?

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00:09:02,000 --> 00:09:04,000

What is the tornado?

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00:09:04,000 --> 00:09:07,000

Very simply, it's a storm gone bad.

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00:09:07,000 --> 00:09:09,000

Very bad.

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00:09:09,000 --> 00:09:16,000

These killer winds' behaviors, if possessed by a malignant intelligence and like many killers, they are unpredictable.

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00:09:29,000 --> 00:09:32,000

Tornadoes are always born in the turmoil of a thunderstorm.

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00:09:32,000 --> 00:09:41,000

Warm, moist air pressing against dry air creates an atmospheric which is brewed that soon forms clouds, and then, as it cools, rain.

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00:09:42,000 --> 00:09:49,000

Thunderstorms are quite common, but in rare cases, the elements collide and a tornado begins to emerge.

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00:09:57,000 --> 00:10:01,000

Occasionally, if the storm was to come, it would be a very dangerous situation.

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00:10:02,000 --> 00:10:16,000

If the storm keeps growing, the winds at the top of the storm begin to rotate, and if that rotation continues and tightens, that spinning vortex may become something deadly, something called a tornado.

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00:10:19,000 --> 00:10:26,000

Can we predict the arrival of one of these rogue storms? Some meteorologists believe it may be impossible.

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00:10:26,000 --> 00:10:37,000

It's extremely difficult. In fact, I would say it's nearly impossible to predict exactly where and when a severe thunderstorm, which might produce a tornado, would tend to form.

93

00:10:38,000 --> 00:10:52,000

So my feeling is we may be able to give 20 or 30 minutes notice for the very large tornadoes, but to be able to say that three hours from now a tornado was going to form over a certain city is absolutely impossible.

94

00:10:52,000 --> 00:10:59,000

And I would say that we probably might not be able to do that for perhaps 50 or even 100 years.

95

00:11:01,000 --> 00:11:11,000

On May 8, 1986, the small community of Edmond, Oklahoma, huddled indoors. The air was electric. Something evil was on the loose, and as the day met the evening, the time of the winds began.

96

00:11:12,000 --> 00:11:21,000

On that day we were getting signs of some impending heavy thunderstorms across Oklahoma. We were watching for indications from the National Weather Service.

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00:11:21,000 --> 00:11:32,000

We were also listening to folks down at Severe Storms Lab in Norman, and we did have an indication of some very strong thunderstorms in the building later in the day.

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00:11:33,000 --> 00:11:40,000

As night began to fall, so too did the winds, forming into a huge black funnel.

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00:11:42,000 --> 00:11:50,000

Those funnels, very shortly thereafter, one of them at least touched down, became the Edmond tornado.

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00:11:50,000 --> 00:11:57,000

That night, few slept as the winds ravaged the terrified community.

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00:12:02,000 --> 00:12:07,000

It looked like a war zone, absolutely. There was debris four and five feet thick.

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00:12:08,000 --> 00:12:16,000

We had both cars destroyed. Our blazer, which was just a couple days old, was thrown upside down into our front bedroom.

103

00:12:17,000 --> 00:12:21,000

We'd looked across the street from us, and there was total devastation. It looked like a bomb had been dropped.

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00:12:22,000 --> 00:12:29,000

Edmond was completely devastated, but miraculously, no one was killed or even injured.

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00:12:33,000 --> 00:12:40,000

I feel very fortunate we survived. In looking at the neighborhood afterwards, it's a miracle that people didn't die.

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00:12:40,000 --> 00:12:49,000

The people that were affected completely devastated, that were right in the path of the tornado, all were astounded that no one was injured.

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00:12:49,000 --> 00:12:54,000

That we actually came out of this alive and just happier people for it.

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00:12:55,000 --> 00:13:00,000

The people of Edmond survived, but nobody can say for certain when another tornado will return.

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00:13:01,000 --> 00:13:04,000

Can we predict the unpredictable? Stop the unstoppable?

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00:13:05,000 --> 00:13:11,000

These questions are of paramount importance to millions of people who live in the area known as Tornado Alley,

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00:13:12,000 --> 00:13:16,000

a wide strip of land that spans the central plains of the United States.

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00:13:17,000 --> 00:13:24,000

Right at the heart of this area stands a laboratory that has joined the battle against these hellish winds.

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00:13:25,000 --> 00:13:33,000

While most people do everything possible to stay out of the way of a tornado, scientists of this laboratory are doing just the opposite.

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00:13:34,000 --> 00:13:39,000

We have a lot of sensors here at the National Severe Storms Laboratory that we use to make measurements in storms.

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00:13:39,000 --> 00:13:46,000

Very important to our research are the radars, and right now the kind of radar that we use are Doppler radars.

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00:13:46,000 --> 00:13:55,000

They are newer, somewhat different than radar we had in the past, and the way that they are different is that they add a new piece of information.

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00:13:55,000 --> 00:14:02,000

That information, properly processed, gives you the motion of those rain drops up inside the storm.

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00:14:02,000 --> 00:14:09,000

Knowing the air motion inside the storm, then we can learn how that storm evolves, what makes it tick,

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00:14:09,000 --> 00:14:12,000

how does the air get flowing in the direction that it flows.

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00:14:12,000 --> 00:14:17,000

And very important, perhaps the most important piece of information is when does it start spinning.

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00:14:17,000 --> 00:14:24,000

Many warning given before a tornado strikes can save hundreds of lives, and that warning time may increase.

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00:14:25,000 --> 00:14:30,000

Through the use of sophisticated atmospheric analysis and radar mapping, we may gain precious minutes.

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00:14:30,000 --> 00:14:36,000

Time also gains through the efforts of dedicated researchers who defy the winds to do their worst.

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00:14:37,000 --> 00:14:43,000

Today there are men and women who don't cower before the deadly wind. They seek it out.

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00:14:43,000 --> 00:14:50,000

Why? To learn its secrets. Secrets they can share with us.

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00:14:52,000 --> 00:14:58,000

When tornadoes strike, most rational people head for their basement. But not these men and women.

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00:14:58,000 --> 00:15:03,000

No, they head right into the winds, risking their lives in the pursuit of knowledge.

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00:15:04,000 --> 00:15:10,000

Storm chasers are a particular breed of person. It's actually almost inbred in you.

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00:15:10,000 --> 00:15:16,000

There's something that tells you you want to go out and chase severe thunderstorms and tornadoes.

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00:15:16,000 --> 00:15:21,000

It sounds kind of off the wall, but there's a particular breed of us who'd love to do it.

131

00:15:21,000 --> 00:15:29,000

And we kind of derive a particular thrill of going out and seeing what is such a fleeting

occurrence on the Earth.

132

00:15:30,000 --> 00:15:35,000

Okay, deploy, deploy, deploy. Let's go. I got the thing. Deploy. Yeah!

133

00:15:35,000 --> 00:15:41,000

Many of these storm chasers travel with highly sophisticated equipment, designed to measure the force of the storm.

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00:15:41,000 --> 00:15:45,000

Equipment that forms a virtual laboratory on wheels.

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00:15:47,000 --> 00:15:55,000

The mobile laboratory is used to move out, intercept severe and potentially dangerous storms,

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00:15:55,000 --> 00:16:02,000

track with those storms, make measurements on those storms for future scientific analysis.

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00:16:02,000 --> 00:16:09,000

But in the process, we would radio back-end information that might affect the public safety.

138

00:16:09,000 --> 00:16:19,000

I find that to be out in the open fields and in the presence of a very large storm is a rather awe-inspiring incident.

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00:16:19,000 --> 00:16:29,000

You really do understand that you are an insignificant factor in front of a very large machine in the atmosphere.

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00:16:30,000 --> 00:16:34,000

Tornado trackers are not the only people who face these winds.

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00:16:34,000 --> 00:16:39,000

The rest of the residents of Tornado Alley must also watch and wait.

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00:16:39,000 --> 00:16:44,000

But there are warning signs that anyone can look for.

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00:16:44,000 --> 00:16:50,000

Obviously, violent storms can herald something unpleasant, the arrival of a tornado.

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00:16:50,000 --> 00:16:59,000

The clouds were building and the neighbors were outside looking. We were all looking at the storm and we knew there was something to be concerned about then.

145

00:16:59,000 --> 00:17:04,000

I started weather-watching and went out on the front porch and was watching the clouds roll in.

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00:17:04,000 --> 00:17:07,000

The more they rolled in, the darker and deeper they got.

147

00:17:07,000 --> 00:17:19,000

What I would refer to as a wall cloud is it's real black on the bottom and it's almost as if someone took a ruler and drew a line in the sky.

148

00:17:19,000 --> 00:17:24,000

It was pouring down rain like crazy. I mean, you wouldn't believe the way it was raining.

149

00:17:24,000 --> 00:17:30,000

Then we got a pea-sized hail that came shortly after that, like it was pouring out of a bucket.

150

00:17:30,000 --> 00:17:39,000

I watched the tornado form. It little wisp clouds happened to start rotating and then all of a sudden it just fell out of the sky.

151

00:17:39,000 --> 00:17:48,000

We saw it coming and we were just at God's mercy as to whether or not it was going to hit, whether or not it was going to destroy, whether or not it was going to kill.

152

00:17:48,000 --> 00:17:58,000

It is usually futile to run from a tornado, but over the years, crucial information has been gathered that has saved thousands of lives.

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00:18:00,000 --> 00:18:11,000

The first thing that people should consider in preparing for a tornado is that there's actually very little you can do to prevent property damage in an existing building.

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00:18:11,000 --> 00:18:15,000

So what your really goal is is to prevent injury and prevent death.

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00:18:15,000 --> 00:18:24,000

If a tornado warning is issued, people should immediately seek shelter in a basement.

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00:18:24,000 --> 00:18:29,000

We've got to tell them to put as many walls between themselves and the tornado as they can.

157

00:18:29,000 --> 00:18:37,000

If a tornado does get close enough that it's going to start doing some damage, it's going to start tearing down the outside walls first.

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00:18:37,000 --> 00:18:44,000

Don't stay in the car because a tornado will just tumble it over and over on the ground. Many people are killed in just that way.

159

00:18:45,000 --> 00:19:00,000

Tornadoes can destroy human lives and they can shatter the living as well, taking away their homes, their possessions, blowing their very lives to the brink of ruin.

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00:19:00,000 --> 00:19:07,000

But out of this destruction can come hope, hope that is said to spring eternal.

161

00:19:07,000 --> 00:19:17,000

A celebration of the human spirit that in its own way is as mysterious and unpredictable as the tornado itself.

162

00:19:20,000 --> 00:19:26,000

Though tornadoes take on many shapes and sizes, the human heart remains large.

163

00:19:27,000 --> 00:19:35,000

People who didn't know each other became very close after the tornado because we shared something that was terrifying.

164

00:19:35,000 --> 00:19:44,000

This was Edmund Oklahoma the day after. Already the town was being rebuilt and already people were finding the strength to carry on.

165

00:19:44,000 --> 00:19:55,000

It became kind of a joke. I mean everybody started just laughing about it and with no injuries it was easy to just be thankful that you were still alive and that no one was injured.

166

00:19:55,000 --> 00:19:58,000

And that we were able just to start over.

167

00:19:58,000 --> 00:20:08,000

Today Edmund is whole again. Its inhabitants as secure as they can be because on the horizon a dark cloud remains.

168

00:20:11,000 --> 00:20:20,000

Tornadoes are a reminder of how fragile the works of man are. The more we know about them the less in control of them we see.

169

00:20:20,000 --> 00:20:28,000

It's as if nature wanted to teach us humility and leave us trembling in the face of power beyond our comprehension.

170

00:20:32,000 --> 00:20:34,000

Tornadoes.

171

00:20:37,000 --> 00:20:40,000

Winds that can tear the world apart.

172

00:20:51,000 --> 00:21:02,000

Secrets and mysteries presents information based in part on theories and opinions, some of which are controversial.

173

00:21:02,000 --> 00:21:13,000

The producer's purpose is not to validate any side of an issue but through the use of actualities and dramatic recreation relate a possible answer but not the only answer to this material.

174

00:21:20,000 --> 00:21:22,000

Tornadoes.