Advanced| Practical | 3 | Deep Dive| Tornadoes

Collide: To come together with solid or direct impact.
Comes to a close: Winds down, comes to an end, to near the end.

Deep Dive: An in-depth examination or analysis of a topic.

Exaggerating: Act of making an overstatement. Enlarging the truth.

Faint of heart: Lacking the courage to do something.
For a living: Primary career or way to make money.

Geographical Landmarks: An external point of reference on the Earth's surface.
Gust: Sudden, strong rushes of wind varying in intensity.

Hems in: Surrounds and contains.

Idiom: A saying where the meaning is not easily understood from the words used.

Miles/Hour: 1 Kilometer/Hour = .62 Miles/Hour.

Outbreak: The sudden start of something unwelcome and unwanted.

Scale: A mthod of measuring.
Severe: Extreme, very great, intense.
Shocking: Extremely startling and surprising.
Strike (To Strike): To come into contact forcefully.
Siren: A device that creates a penetrating warning sound.

Torn apart: Completely destroyed.
Transcript: A written version of material from another format.

Vaster: Greater in Size or amount.
Vertical: Positioned up and down, going straight up or down.

Deep Dive | Tornadoes | YouTube Video:

Advanced| Practical | 3 | Deep Dive| Tornadoes | Transcript

Hi, Welcome to Learn English Well 'Deep Dive'. Merry Christmas, if you celebrate that holiday, and as 2021 comes to a close – Happy New Year! My name is Robert, and I am here to help you to improve your English fluency through deep dives such as this one. We have created these videos in order to cover interesting topics that are entertaining and educational. Above all, we want to help you to become more fluent in English through reading about, and listening to, interesting subjects. What better way to learn English than to learn about the world through English?

For more information, please visit our website at "LearnThatEnglish.com", where we organize our videos, and where you can find more helpful information. You can also download a transcript of this deep dive, as well as the vocabulary and idioms used, by clicking on the link in the comments below, and downloading a PDF to study on your own. Also, remember, you can start, stop, rewind, and replay this video as many times as you need to. Today let's discuss the tornado.

This month in the United States, December, 2021, we had a violent outbreak of tornadoes that caused many deaths and injuries.

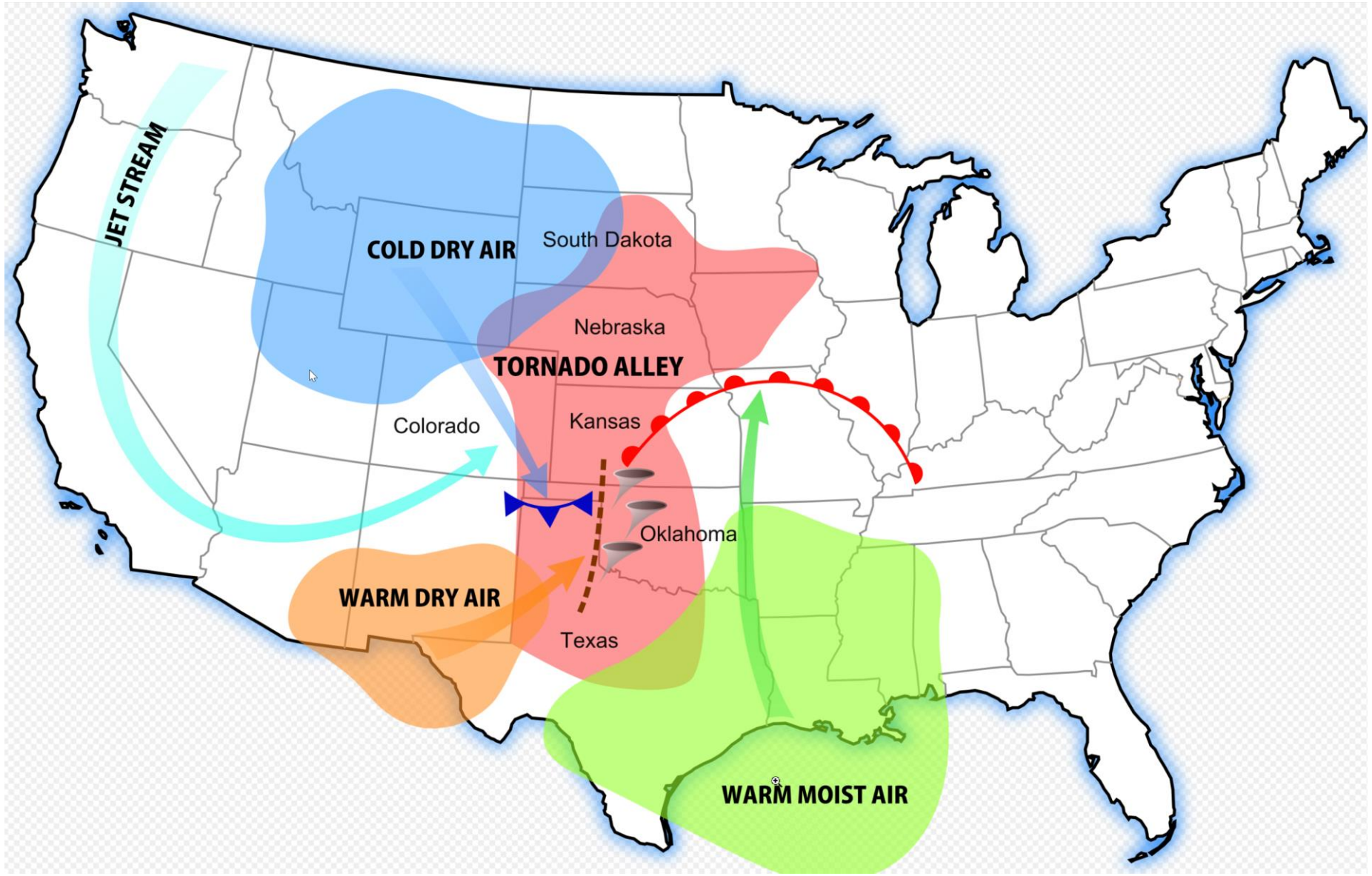
What is a tornado? How do they form and why? Why does the United States seem to have so many of these tornadoes? How can we prepare for tornadoes in order to save lives?

Tornadoes usually form in thunderstorms, which often develop in strong storm fronts. What is a thunderstorm? Thunderstorms are the large and dangerous storms that are created, when masses of air are lifted up rapidly by differences in temperature and moisture. What is a storm front? A storm front is a long line of weather, where cold air is pushing warm air forward or vice versa.

Inside these large storm fronts and thunderstorms, fast and violent airflows often occur. These winds have sudden severe gusts that go up, down and sideways. Under the right conditions, these winds begin to rotate quickly around each other, and can form huge and quickly spinning masses of air. These whirling streams of air can result in tornadoes.

Why are there so many tornadoes here in the US? It turns out that the reason is mainly due to geography. The Central United States has all the perfect geographical landmarks that work together to create these destructive wind storms. Take a look at the diagram. This area is called 'Tornado Alley' due to how many tornadoes occur here each year.

Advanced| Practical | 3 | Deep Dive| Tornadoes | Transcript



Advanced| Practical | 3 | Deep Dive| Tornadoes | Transcript

There are four primary geographical landmarks that create this unique area:

First, there is an incredibly large body of warm water to the south called the Gulf of Mexico. The water in this ocean warms all the air above it, and creates a hot and humid giant volume of air that tends to hang over the southern states around it such as Texas, Oklahoma, Louisiana, Alabama, and Arkansas.

Second, to the North, there are large land areas in Canada where cold and dry air masses are pushed south by the normal flow of currents across the planet.

Third, there is a long and tall mountain range to the west called the Rocky Mountains, that acts as a barrier that hems in these air flows as they go south.

Fourth, the Central United States location is an extremely flat plain that extends east of the Rocky Mountains, so there are no other hills or mountains to break the flow of air.

During Spring and Fall, when most of these tornadoes form, huge masses of cold air from the north move south and collide with warm air from the Gulf Of Mexico, to create these long storm fronts and storms. The result is these powerful winds that combine and end up rotating violently, and then start turning more vertical to reach the ground. Tornadoes occur when these winds touch the ground and cause damage.

The winds can be up to four hundred and fifty kilometers per hour (280 miles/hour) in these storms, and with these wind speeds they destroy everything in their path. The fastest wind speed ever recorded by weather radar was four hundred eighty six kilometers per hour (302 miles/hour) in Bridge Creek, Oklahoma in 1999. It is not exaggerating to say that these wind speeds are devastating.

Tornadoes do occur elsewhere in the world. They mainly develop where these same types of geographical landmarks exist, such as in South America near the Andes mountains, Asia near the Himalayas mountains, Southern Europe, and several other places. However, the number is far higher and stronger in this location in the United States.

Advanced| Practical | 3 | Deep Dive| Tornadoes | Transcript

So, this is why Tornado Alley has so many tornadoes. The mountains to the west are higher, the Gulf of Mexico to the south bigger and warmer, the northern cold plains of Canada vaster, and the central plains wider than any other place on the planet. This is why up to 75% of all tornadoes, and just about all of the most powerful tornadoes measured, occur in this area.

Most tornadoes that develop are not that powerful. There is a system called the Fujita EF Scale, and this system ranks them based on wind speed. EF-0 is the weakest, and EF-5 tornadoes are the strongest, and are extremely dangerous. See the diagram to see the wind speeds each has. EF-4 and EF-5 tornadoes are the storms that kill many people a few times a year. Tornadoes can be much more destructive than a hurricane, but thank goodness they cover a much smaller area when they strike. How can lives be saved?

First, computer modeling is used by weather services to predict when these types of storms are going to develop. Although these predictions have improved greatly with more powerful computers and technology, they are often still wrong in predicting these storms. This is the way to give people the most advanced warning, but, unfortunately, the predictions are often not that accurate.

Second, the United States and these local states in Tornado Alley have invested large sums of money in advanced ‘Doppler Radar’, a type of radar technology that can see inside these storms and storm fronts as they develop.

Third, these states have developed several emergency systems to alert people ahead of time. Cell phone notifications and alerts are used, as well as local television channels and radio, to let people know. Also, loud sirens are activated that can be heard far away. When people receive these warnings, they can hide in underground cellars that are dug under the ground for this purpose. These strong cellars can survive the strongest tornadoes and save lives.

However, because these storms are extremely hard to predict, people often do not get much time to reach safety. Sometimes, people do not have the opportunity to find shelter, and the results can be deadly. The storms this past week killed over 100 people.

Advanced| Practical | 3 | Deep Dive| Tornadoes | Transcript

EF-scale	Class	Wind speed mph	Wind speed km/h	Description
EF-0	weak	65-85	105-137	Gale
EF-1	weak	86-110	138-177	Moderate
EF-2	strong	111-135	178-217	Significant
EF-3	strong	136-165	218-266	Severe
EF-4	violent	166-200	267-322	Devastating
EF-5	violent	> 200	> 322	Incredible

Advanced| Practical | 3 | Deep Dive| Tornadoes | Transcript

In one instance, workers were in a large and strong building that seemed like it could survive any storm. The results were shocking – the building was torn apart, and many of the people inside lost their lives. Few if any buildings can withstand 300+ kilometers per hour wind. There were several other areas where people were killed, since it was not just one tornado.

These tornadoes, as you have seen, are absolutely incredible, beautiful, and dangerous. It is definitely best just to see them in pictures, and not in real life. They are unpredictable in how they move, and the damage they inflict. They can destroy a house, and then hop over the next house leaving it untouched. A tornado destroyed the building described earlier, but then there was a pair of babies in a bathtub, who were picked up by the winds, when their house was destroyed, but somehow survived.

Believe it or not, there are also many people that chase these storms trying to get great photos or videos of these tornadoes when they appear. They try to get as close as possible, and follow these storms for long distances, as they watch for tornadoes. Some have even been killed trying to do so. This does not seem like a career for the faint of heart. These brave people are called 'Storm Chasers' because they chase these storms for a living. As for myself I say - No thank you!

Nature is truly amazing!

Thank you for listening, and we hope this video has been informative, entertaining, and educational.

Please leave your comments with opinions about the topic, ways we can improve our videos in the future, any new conversational ideas, and any other thoughts you would like to share. We would love to hear from you. Please like our video by clicking the Like button – and especially be sure to Subscribe, and to turn on Notifications, so that you will know when we publish our next video. Please take care. I look forward to another deep dive in the near future.

Until then.