

Dust Devils

My husband (somewhat of a dust devil himself) & I were driving down the county road the other day and saw several dust devils which reminded me of what the old cowboys used to say--if it turned a certain way it meant rain and if it was spinning the other way it meant drought, but I couldn't remember which way was which. The Navajo refer to these whirlwinds as *chiindii*, ghosts or spirits of dead Navajos. If a chindi spins clockwise, it is said to be a good spirit; if it spins counterclockwise, it is said to be a bad spirit. So I guess we folks in Texas are mostly looking for clockwise spinners.

A dust devil is a strong, well-formed, and relatively long-lived whirlwind ranging from small to large. The primary vertical motion is upward. Dust devils are usually harmless, but can on rare occasions grow large enough to pose a threat to both people and property.

They are comparable to tornadoes in that both are a weather phenomenon of a vertically oriented rotating column of air, but most tornadoes are associated with a thunderstorm. Dust devils form as a swirling updraft under sunny conditions during fair weather, rarely coming close to the intensity of a tornado.

Dust devils form when hot air near the surface rises quickly through a small pocket of cooler, low-pressure air above it. If conditions are just right, the air may begin to rotate. As the air rapidly rises, the column of hot air is stretched vertically, causing intensification of the spinning effect. The secondary flow in the dust devil causes other hot air to speed horizontally inward to the bottom of the newly forming vortex. As more hot air rushes in toward the developing vortex to replace the air that is rising, the spinning effect becomes further intensified and self-sustaining. A dust devil, fully formed, is a funnel-like chimney through which hot air moves, both upwards and in a circle. As the hot air rises, it cools, loses its buoyancy and eventually ceases to rise. As it rises, it displaces air which descends outside the core of the vortex. This cool air returning acts as a balance against the spinning hot-air outer wall and keeps the system stable.

The spinning effect, along with surface friction, usually will produce a forward momentum. The dust devil is able to sustain itself longer by moving over nearby sources of hot surface air. Since dust devils are seen mostly in hot, dry weather and ranchers are always looking for any sign of rain, this could explain the how the myth got started.

As available extreme hot air near the surface is channeled up the dust devil, eventually surrounding cooler air will be sucked in. Once this occurs, the effect is dramatic, and the dust devil dissipates in seconds.

Certain conditions increase the likelihood of dust devil formation including flat barren terrain, desert or tarmac, clear skies or lightly cloudy conditions, and light or no wind and cool atmospheric temperature.

Most dust devils are very small and weak, often less than 3 feet in diameter with maximum winds averaging about 45 miles per hour, and they often dissipate less than a minute after forming. On rare occasions, a dust devil can grow very large and intense, sometimes reaching a

diameter of up to 300 feet with winds in excess of 60 mph and can last for upwards of 20 minutes before dissipating.

A fire whirl or swirl, sometimes called fire devils or fire tornadoes, can be seen during intense fires in combustible building structures or, more commonly, in forest or bush fires. A fire whirl is a vortex-shaped formation of burning gases being released from the combustible material. The genesis of the vortex is probably similar to that of a dust devil.

Hot cinders underneath freshly deposited ash in recently burned areas may sometimes generate numerous dust devils. The lighter weight and the darker color of the ash may create dust devils that are visible hundreds of feet into the air. This is perhaps a more likely explanation than a coyote with his tail on fire for how even well managed range fires sometimes get out of control!

Go outside & play!