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May 4, 2006



Heat Burst

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Dr. Greg Forbes, Severe Weather Expert

Winds gusted to 69 mph at Fort Worth's Meacham Airport (FTW) shortly after 3 a.m. on Wednesday, flipping airplanes and damaging roofs near the airport. There was even an estimated 90 mph wind gust at the heliport nearby.

Now at this time of year, severe winds aren't that unusual. But in this case, note that temperatures shot upward from 72 to 82F. Usually they plummet during a thunderstorm. So this event wasn't from a severe thunderstorm but from a relatively rare phenomenon called a heat burst.

You can see the localized red warm spot over Fort Worth on the figure at the time of the event. Data on the figure shows how quickly the temperatures and winds evolved.

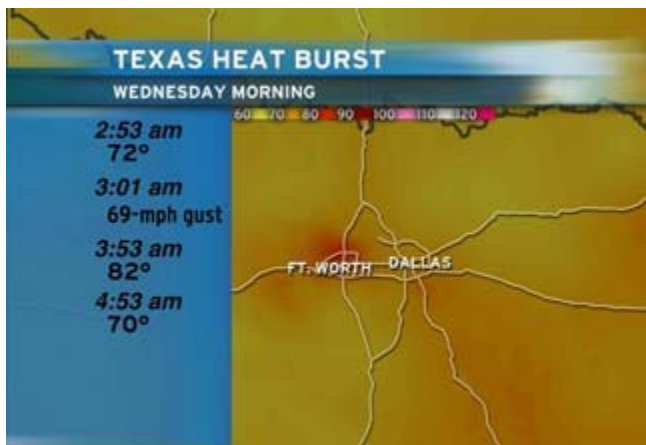


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It's called a heat burst because it brings a warmup and its winds strike in a bursting pattern. It is caused by downward moving winds -- downdrafts -- that hit the ground and burst outward as strong gusts.

This is very different from the typical severe thunderstorm winds. Those are usually on the front side of an intense thunderstorm, and a cloudburst of rain that shows up with a red core on radar. They bring a dramatic cooling. Radar from the time of the heat burst shows light green radar shading over the airport, characteristic of just sprinkles of rain. There was only a trace of rain at the airport during a 9-minute sprinkle.

Heat bursts happen a few time per year across the country, mostly in the Central and Southern Plains. Like this one, they typically develop in sprinkles of rain on the edge of a dissipating thunderstorm. They happen at night after the air near the surface has cooled down in a shallow layer near the surface, while the air above the surface is still quite warm. Fort Worth had cooled from a high of 85 down to 72.

The sprinkles are enough to initially cool the air aloft, causing it to start to descend in a slightly cooled downdraft within that warm surrounding air well above the ground. But since there are just a few drops and not a cloudburst, it doesn't get very cold. In fact, it's warmer than the air at the ground. But its downward momentum carries it to the ground, and the temperature there rises!

We know how to explain what happened. But can we make a specific forecast of a heat burst? Nope. There are lots of sprinkling edges of dissipating thunderstorms every day. Why just a few per year produce heat bursts is beyond current predictability.

Posted at 2:22 pm ET

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Reply to Kyle

That swirl you saw over Ohio was a little circulation center associated with the big upper low that has stalled over the Great Lakes and Ohio Valley. It helped give the flooding in New England on its east flank.

As far as forecasting severe weather for Ohio for the next few months, expect quite a bit. Once we get out of the current cool pattern, June and July are busy months for severe thunderstorms.

Posted by Greg Forbes | May 16, 2006

Well, I know you are a sever weather expert...and I was just curious if you could see any patterns or anything that would be sever weather in Ohio in the next month or so?

I am an Ohio resident and I was watching The Weather Channel and I noticed what seemed to be a mini hurricane over Ohio. Could you please explain more of it because I have never seen something like this.

-Kyle

Posted by Kyle Fani | May 15, 2006

Reply to David -
Yes, the temperature shot up to 82.

Posted by Greg Forbes | May 9, 2006

Dr. Greg,
Wow I have never heard of a heat burst, strange way to happen to rise in temperature during that time of night with a thunderstorm
Thanks

Posted by Brian Boehlert | May 9, 2006

i her that the temps went to 82 when they had the highs winds is that right?

Posted by david | May 5, 2006

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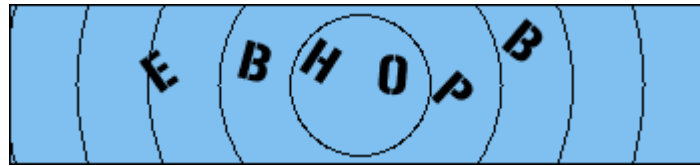
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