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WHAT IS A HEAT BURST?

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A heat burst is a downdraft of hot and dry air that typically occurs in the evening or overnight hours. A heatburst is much more rare than a severe thunderstorm. Thus, the atmospheric conditions have to be just right for a heat burst to occur. Heat bursts usually happen in the evening or at night after thunderstorms are ending. Thus, a thunderstorm has a vital role. Two other characteristics are that the air must start its descent from fairly high up and the environmental air aloft needs to be very dry. Precipitation falling into very dry air aloft will cause the air to cool through latent heat absorption. If the air is very high aloft and the air is much more dense than the surrounding air then it will accelerate toward the surface. In the case of a heat burst, all the precipitation that cooled the air aloft has been vaporized. Therefore, the precipitation can no longer absorb latent heat. As this dense air accelerates toward the surface it rapidly warms at a dry adiabatic lapse rate compression. What must make a heat burst so rare is that this downdraft must reach extremely high velocities. Velocities must be high enough so that the momentum of the sinking air offsets the fact that it is becoming warmer in temperature and thus less dense than the environmental air it is falling into.

Not only is the air in a heat burst anomalously hot but it is also extremely dry. The extremely high temperatures combined with extremely dry air plus the wind can remove all the moisture out of vegetation. Just like any atmospheric phenomena, heat bursts have differing intensities. The worst heat bursts persist for a significant amount of time and have temperatures that go over 120 F, even in the middle of the night. This extremely hot and dry air can remain in place for several hours before temperatures return to normal.

A microburst occurs through the same process except that the origin of the microburst is not as high aloft as a heatburst. Thus, the microburst is not able to get as much adiabatic compression as a heatburst. Often a microburst will not lose all of it's precipitation before hitting the ground. If precipitation is within sinking air, evaporative cooling will partially offset the adiabatic compressional warming.