Tornadic Events During UNSTABLE

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July 7th Synoptic Soundings
An F0 tornado occurred July 7th, 2008 2200 UTC near Calgary, AB. The closest synoptic soundings were Great Falls, MT, TFX (443 km) and Stony Plain, AB, WSE (276 km)

The 0000 UTC TFX sounding exhibited a mid-level (subidence) capping inversion and a very dry boundary layer resulting in low SBCAPE values of 34 J kg⁻¹. Low-level winds were backed to weak easterly which is an upslope direction favorable for moist parcel lift. Tornadic potential was low with 0-1 km SRH values of 29 m² s⁻² and 0-6 km shear of 19 kt and high LCL of 2500 m AGL.

At 0000 UTC WSE indicated unidirectional northwest winds. Combined with dry low levels producing nil CAPE values, this sounding would be indicative of no convective initiation.

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July 15th Synoptic Soundings
An F1 tornado occurred July 15th, 2008 2300 UTC near Vulcan, AB. The closest synoptic soundings were Great Falls, MT, TFX (355 km) and Stony Plain, AB, WSE (351 km)

The 0000 UTC TFX sounding exhibited a very dry boundary layer only producing 2 J kg⁻¹ SBCAPE with strong 0-6 km speed shear of 42 kt, although unidirectional from the west with weak low-level winds. 0-1 km SRH 2 m² s⁻² and high LCLs of 3000 m AGL were also not indicative of convective or tornadic potential.

At 0000 UTC WSE indicated backed southeasterly low-level winds, and favorable SBCAPE values of 655 J kg⁻¹ with the LCL and LFC at 1250 m AGL although dry low-levels. Low 0-6 km shear of 4 kt. 0-1 km SRH 19 m² s⁻² were not indicative of tornadic potential.

Supplemental Soundings

Supplemental soundings better represented the pre and near storm environment by giving a more accurate measurement of large CAPE and backed low-level winds, more indicative of supercell potential.

Conclusion

References