

Skew-T Questions

These are questions concerning values displayed on the [UNISYS SKEW-T graphic](#) and in the text that accompanies the graphic that expand understanding of the stability of the air mass over this area, together with its potential for severe weather. No one value is determinative; most need to be assessed in conjunction with other values (as, for example, Bulk Richardson Number).

Sounding Variables And Indices

- _____ 1000-500 mb Thickness
- _____ Y / N - Precipitable Water: Greater than 0.75"? Greater than 1.5"?
- _____ Sfc-Lift Cond Lev (LCL; Lifting Condensation Level from surface)
- _____ Y / N - L57 Lapse Rate: Greater than 5.5° C/km? greater than 6.7° C/km? Greater than 10° C/km?
- _____ Y / N - Is the Theta-E Index greater than 5? Greater than 8?
- _____ Y / N - Lifted Index (LI): Less than -4? Less than -8? Risk: _____
- _____ Y / N - Showalter Index (SI): Less than -4? Less than -8? Risk: _____
- _____ Y / N - Total Totals Index (TT): Greater than 53? Greater than 56? Risk: _____
- _____ Y / N - K Index (KI): Greater than 26? Greater than 40? Risk: _____
- _____ Y / N - SWEAT Index (Severe Weather Threat): Greater than 300? Greater than 400? Risk: _____
- _____ Y / N - Energy Index (EI): Less than 0? Less than -2? Risk: _____

Parcel Indices

- _____ Y / N - CAPE (Convective available potential energy): Greater than 1,500? Greater than 2,500?
- _____ Y / N - Max Up Vert Vel (Maximum Upward Vertical Velocity; UVV): Greater than 3? Greater than 5?
- _____ Y / N - CINH (Convective inhibition): Greater than 51? Greater than 200?
- _____ Y / N - CAP (Cap strength): Greater than 2.0? Greater than 4.1? Greater than 5?
- _____ Lift Cond Lev (LCL; Lifted condensation level (mb))
- _____ Lev Free Conv (LFC; Level free convection (mb))
- _____ Y / N - Super-adiabatic lapse rate – where the temperature decreases with height – at a rate of greater than 10 degrees Celsius per kilometer? (data is displayed on the [NWS Skew-T Chart](#) in the lower left corner)

Wind Parameters

- _____ Storm Direction: Direction _____ Knots _____.
- _____ Y / N - Shear (x 10⁻³/s) (SHR+) Greater than 3? Greater than 5? Greater than 8?
- _____ Y / N - Storm Relative Directional Shear (SRDS): Greater than 29? Greater than 59? Greater than 89? Directional shear of 60 degrees or more from the surface to 700 mb?
- _____ Y / N - HEL (Storm relative helicity): Greater than 300? Greater than 400?
- _____ Storm relative vorticity (x 10⁻³/s)
- _____ Y / N - EHI (Energy-Helicity Index): Greater than 1? Greater than 5?
- _____ Y / N - BRN (Bulk Richardson Number): Less than 10? Greater than 45? Between 10 and 45? In the teens?
- _____ Y / N - Upper level winds (between 500 and 300 mb level) of greater than 100 knots?
- _____ Y / N - Low level winds (850 to 700 mb) at 25 knots or greater?
- _____ Y / N - Atmospheric winds increasing at higher levels (upper level speed shear greater than 70 knots)?

Current Surface Conditions

- _____ Y / N - Dew Point greater than 55°? Greater than 65°? Greater than 75°?
- _____ Y / N - Temperature greater than 80 degrees?*
- _____ Y / N - Relative Humidity (RH): Greater than 50%? Greater than 80%?
- _____ Y / N - Is there a 30 to 50 degree surface temperature/dew point spreads? (High microburst potential.)

* High temperature and high dew point – Theta-E – indicates high instability, increasing the threat of severe weather.

Thunderstorm Factors:

1. Conditional instability in the atmosphere. (positive CAPE, negative LI)
2. Trigger Mechanism (Usually *Lift* from convection, convergence, frontal advance, warm or cold air advection, geography)
3. Moisture at deep levels (Surface to 850 mb; stable or dry air aloft may prevent development of cumulonimbus)

Severe thunderstorms may be triggered with the addition of strong speed- and storm-relative directional wind shear (SRDS). Look for veering of 60° or more from the surface to 700 mb; upper level winds greater than 70 knots; low level jet (850-750 mb) greater than 25 knots.