

# Weather Analysis and Forecasting: Homework 1, Part 2 KEY

**35 points: 15 CAPE calculation, 10 Indices, 10 Discussion/Forecast Inference**

## Station #1 Estimates and Forecast Inference

Convective (maximum) temperature: 37°C

Convective condensation level (CCL), boundary layer depth: 800-mb

Level of free convection (LFC): 700-mb

Convective inhibition (CIN): -66 J kg<sup>-1</sup>

Convective available potential energy (CAPE): 3354 J kg<sup>-1</sup> → ***Strong convection***

Maximum vertical velocity estimate of storm updraft: 82 m s<sup>-1</sup>

Equilibrium level: About 150-mb

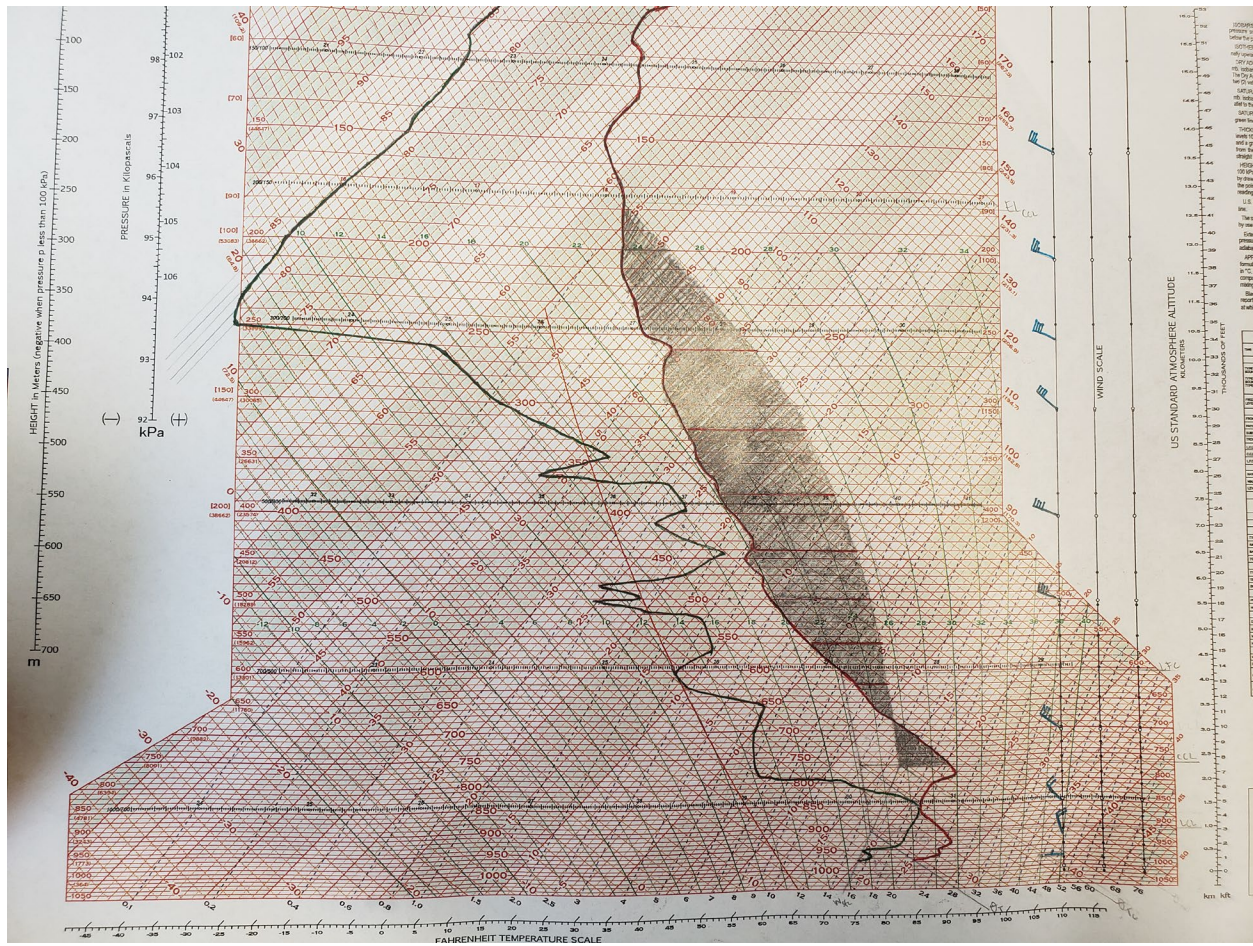
Showalter Index: -11.4 → ***Good strong thunderstorm potential***

Lifted index: -9.6 → ***Heavy to strong thunderstorm potential***

K index: 38 → ***Numerous thunderstorms***

Totals-Totals: 61 → ***Numerous thunderstorms, scattered severe, tornadic***

## Station #1: Sample student sounding



## **Station #2 Estimates and Forecast Inference**

Convective (maximum) temperature: 37°C

Convective condensation level (CCL), boundary layer depth: 700-mb

Level of free convection (LFC): 660-mb

Convective inhibition (CIN): -30 J kg<sup>-1</sup>

Convective available potential energy (CAPE): 650 J kg<sup>-1</sup> → ***Moderate convection***

Maximum vertical velocity estimate of storm updraft: 36 m s<sup>-1</sup>

Equilibrium level: A little above 230-mb

Showalter Index: -3.1 → ***Thunderstorms probable***

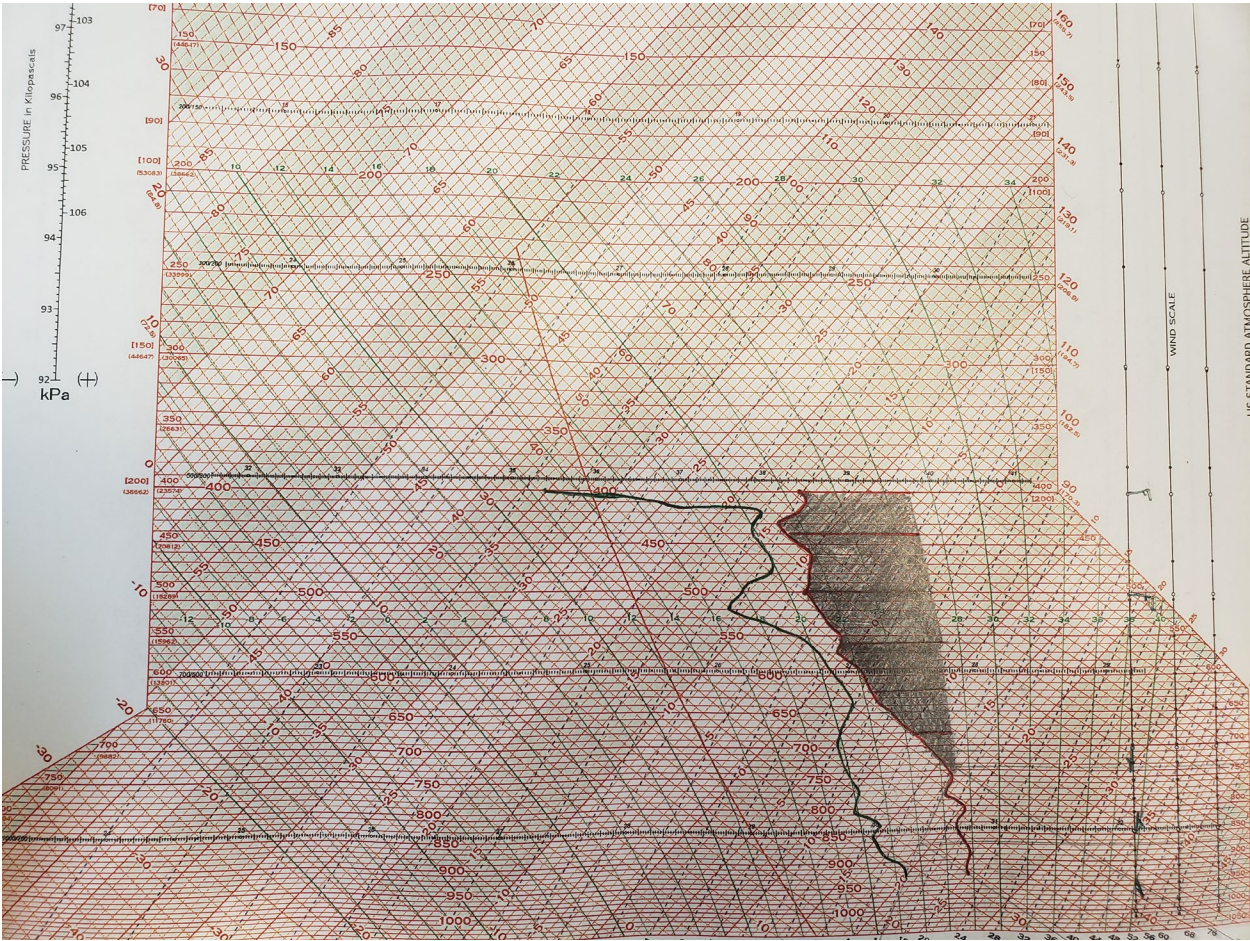
Lifted index: -4.1 → ***Thunderstorms possible***

K index: 36 → ***Numerous thunderstorms***

Totals-Totals: 51 → ***Isolated to scattered thunderstorms***



Station #2: Sample student sounding



### **Station #3 Estimates and Forecast Inference**

Convective (maximum) temperature: 28°C

Convective condensation level (CCL), boundary layer depth: 800-mb

Level of free convection (LFC): 700-mb

Convective inhibition (CIN):  $-180 \text{ J kg}^{-1}$  → Strong cap, favors more isolated convection

Convective available potential energy (CAPE):  $1690 \text{ J kg}^{-1}$  → ***Strong convection***

Maximum vertical velocity estimate of storm updraft:  $58 \text{ m s}^{-1}$

Equilibrium level: A little above 200-mb

Showalter Index: -2.5 → ***Thunderstorms probable***

Lifted index: -9.1 → ***Heavy to strong thunderstorm potential***

K index: 24 → ***Widely scattered thunderstorms***

Totals-Totals: 55 → ***Scattered to numerous thunderstorm, few severe, tornadic***



## Station #3: Sample student sounding

