Today: More Clouds
Skew T, stable vs unstable, relative humidity

Team First plans due date moved to Oct 7, 5 pm
We will finish talking facilities Oct 5

http://www.youtube.com/watch?v=njSssHvWj30#t=1m59s
Ebru

Skew-T continued

NO VERTICAL GRID?

So many lines! How many kinds?
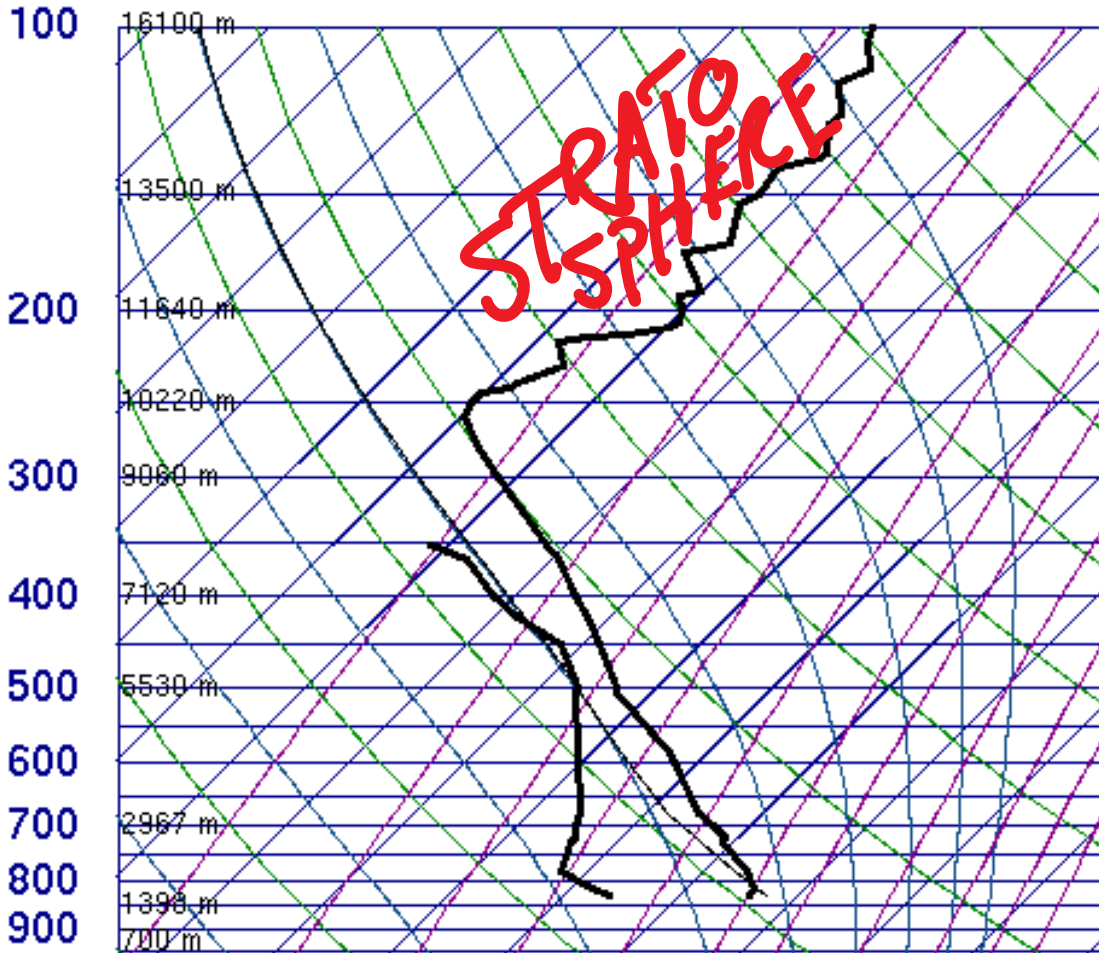
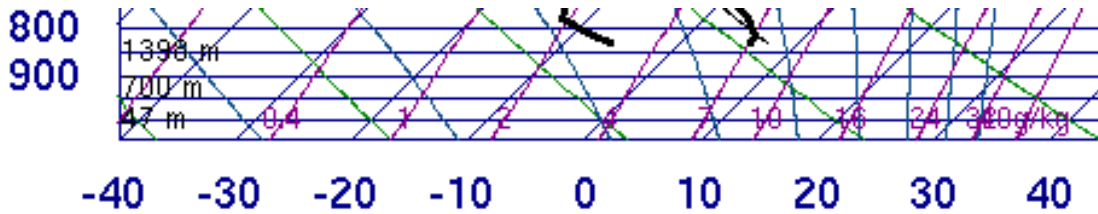|	
Horizontal blue	Constant pressure *isobar*
Angled blue	Constant temperature; isotherm. Angle / SKEW T
Angle/curve green	Dry adiabat. A dry parcel will follow this temperature line if cooled adiabatically
Angle/curve blue	Moist, saturated adiabatic lapse rate
Purple	Lines of constant mixing ratio; absolute humidity for saturation.
Heavy black	Right line is temperature profile. Left line is dew point
Light black	Adiabat starting at the top of the boundary layer

Basics: http://www.theweatherprediction.com/thermo/skewt/
Skew T Mastery: https://www.meted.ucar.edu/loginForm.php?urlPath=mesoprim/skewt#

800
900
1398 m
700 m
47 m   0.4

MLTH 296.0
MLMR 2.36
THCK 5483.
PWAT 5.93

-40   -30   -20   -10   0   10   20   30   40

12Z 05 Feb 2011   University of Wyoming

① Starting parcel

② Raise it, cool it adiabatically (move up along the adiabat), perturb the system

Check it, is my parcel warmer or cooler than the actual neighboring parcels?
- i. Cooler; more dense, wants to sink again, go back to origin STABLE
- ii. Warmer; less dense, wants to keep going up! UNSTABLE

Can start at any point on the actual temperature line. Go parallel to the adiabats. Choose dry adiabat (green) if below likely cloud level or wet (blue, saturated) if in a cloud.

Stable clouds = flat STRATUS type
Unstable clouds = puffy CUMULUS family

Atmosphere is all **stable if CAPE = 0** Convective Available Potential Energy
Has unstable layers if CAPE > 0. Thunderstorms if CAPE > 500 or so.

What was the surface weather on a given day?
http://weatherspark.com/#!
graphs;a=USA/CO/Boulder
Awesome weather archive.

RH

Dew point: Temperature a parcel would have to be cooled to in order to get condensation (dew)
Relative humidity: for a given absolute water vapor concentration, RH is high for low temperatures (close to dew point) and low for high temperatures. So T and RH time plots move opposite (Weatherspark)

Other info on Skew-T: wind indicators, lifting condensation level.

Skew-T download tips: Skew-T Times: Zulu world clock, =Greenwich

mean time GMT
12Z, Feb 14 = ~6 am Feb 14 here
00Z, Feb 1**5** = ~6 **p**m Feb 14 here

Where are clouds? Where temperature is close to dew point, i.e. where the two heavy black lines come together.
Also, kink towards more steep in T line suggests clouds at that level.
Condensation = warming (opposite of evaporation = cooling on your skin)

1. Choose correct date. 12z Feb X is the 6 am sounding, 00z X+
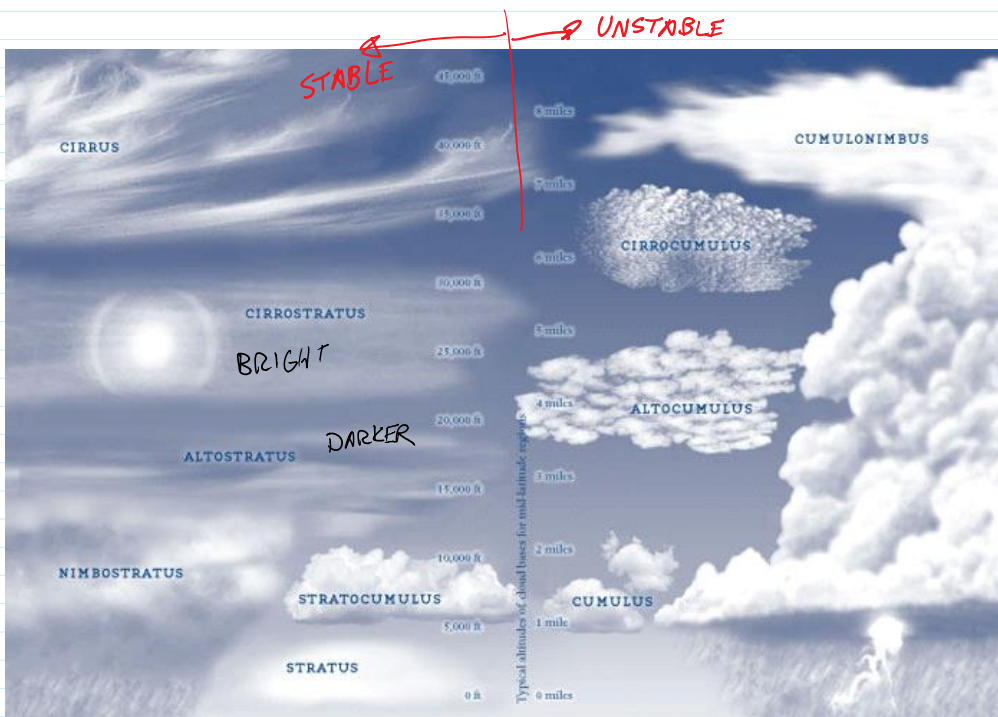   1 is the 6 pm sounding for date X

2. Choose plot, not text
3. Will open in next browser tab

Clouds = droplets or ice MOVING UPWARDS

Lift mechanisms:
1. Instability
2. Orographics: terrain, mountains
3. Synoptic scale weather systems. Both at warm and cold fronts; cold air pushes under in a cold front, warm air overruns in a warm front.
4. Convergence: shoreline temperature differences

Clouds classified by
A. Structure: stratus = flat layers, cumulus = clumps
B. Base height: (2 km)
    a. low: up to 6500 ft (above ground, not from sea level) and vertically developed (includes cumulonimbus)
    b. middle: 6500 to 23,000 ft (2 - 7 km)
    c. high: 16,000 to 45,000 OVERLAP (4.9 - 14 km)
        Cirrostratus: bright, no observable thickness, thin, uniform veil
        Altostratus: darker, may have noticeable thicker regions

Classification guide, one of many