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NATS 101 Introduction to Weather and Climate, Section 54, Fall 2005
Quiz #2 Take Home: Due Tuesday, 1 November 2005.

1. Using graph paper plot the dry, moist and environment temperatures given in Figure 5.3 in your book on one graph. Repeat this exercise for these values in Figure 5.5 and Figure 5.7 on separate pieces of graph paper. Clearly indicate which line is the change in temperature with height of the dry parcel, change in temperature with height of the environment, and the change in temperature with height of the moist parcel on each graph. Using your graphs, describe why the environments are stable, unstable, and conditionally unstable, respectively. [12]

[Staple graph paper to exam before handing it in. Make sure your name is on the graph paper in case it is separated from the exam page.]

2. For parts (a) and (b) below, state what happens to EACH of the five listed variables, assuming the air does not reach saturation and all other variables are held constant. For instance, for part (a) when you are considering what would happen to vapor pressure if the temperature were increased, you can assume that the total amount of moisture and air pressure remain the same.

vapor pressure

mixing ratio

dew point

relative humidity

saturation vapor pressure

(a) An increase in temperature. [4]

vapor pressure - no change

mixing ratio - no change

dew point - no change

relative humidity - decrease

saturation vapor pressure - increase

(b) An increase in the total amount of water in the air parcel. [4]

vapor pressure - increase

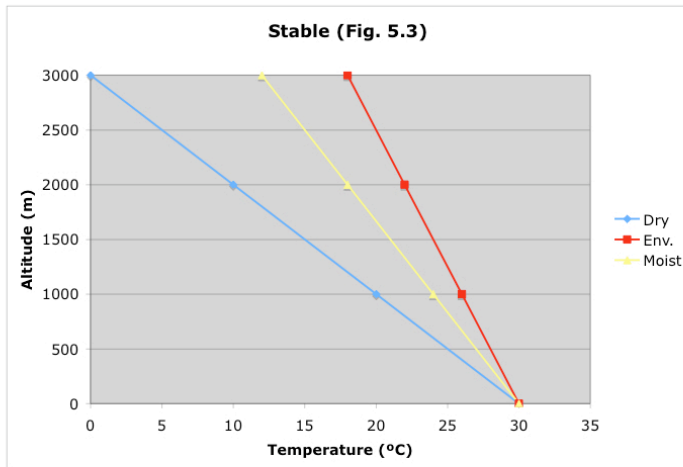
mixing ratio - increase

dew point - increase

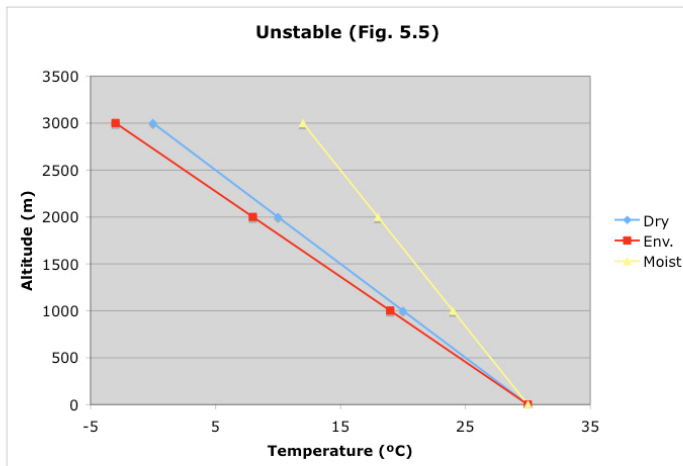
relative humidity - increase

saturation vapor pressure - no change

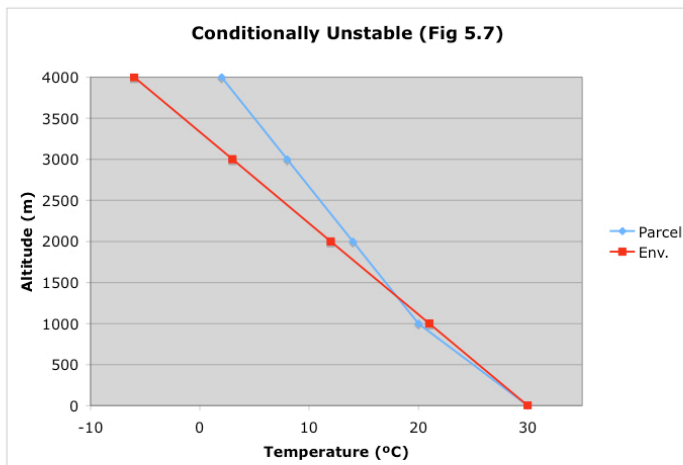
Name _____



-Profile stable because both moist and dry parcels are always colder than environment. Therefore, the parcels will return to their original level if displaced up or down



-Profile unstable because both moist and dry parcels are always warmer than environment. Therefore, the parcels will rise uninhibited if displaced upward



-Parcel colder than the environment and unsaturated. When raised, parcel saturates and becomes warmer than the environment. Therefore the lower levels are stable and the upper levels are unstable.