

Homework–Module 3

Name:

- 1) “Drier with a chance of pouring rain” is the long-range outlook for Arizona. Research conducted at the UA¹ suggests that a warmer Arizona climate by the second half of the 21st century will feature fewer precipitating storms, but when they do occur, they would come with an increased risk of flooding. Use the concepts of the module to explain why precipitating systems in a climate that is 2°C warmer than today would be more intense and hence more likely to produce floods. (Hint: consider the saturation vapor pressure curve of Fig. 4.5 of Ahrens to support your answer.) There is a 600 character limit.



Lake Mead at record low-levels, spring 2016.
Credit: Time.com

- 2) What changes in the weather conditions near the surface and aloft are needed to transform a stable atmosphere into one prone to produce cumulus clouds and thunderstorms? Consider the impact of changes in both the temperature and the moisture content of the air. For sake of brevity, ignore the impact of moisture changes aloft. There is 600 character limit.
- 3) On a calm winter night, the air temperature cooled to the dew point, at which time fog formed and thickened throughout the night. Before the formation of fog, the dew point remained constant. After the fog formed, the dew point began to decrease slowly. Use the concepts of the module to explain why the dew point would decrease once fog forms and thickens. There is a 600 character limit.

¹ Dominguez F. and C.L. Castro, “Climate Projection: Drier with chance of pouring rain.” Arizona Daily Star. November 29, 2012.