RAIN OVERVIEW

Rain is one of many aspects of weather, and climate is weather averaged over decades, therefore rain plays an important role in understanding climate. Water is unique in that it can be a solid, liquid, and a gas within a relatively narrow margin of temperature. In order to have rain, there needs to be a source of water, dust particles in the air, and a temperature warm enough to allow precipitation to fall as rain instead of snow.

It is important to know that, when water is in the form of a gas, warmer air can hold more water molecules than cooler air. If temperature changes suddenly (like it sometimes does during an thunderstorm), the air cools and can hold less water molecules in the form of gas. Water molecules combine with dust particles in the air and eventually become heavy enough, depending on a number of variables including temperature, to fall as raindrops.

Many other aspects of weather and climate play a role in the rainfall in a region. For instance, winds bring warm and cool air in the form of pressure systems to a region, which changes the temperature and affects the likelihood of rain and stormy weather. The water cycle (hydrologic cycle) itself plays a huge role in the amount of rain a region receives. If there is no water reserves, like lakes or rivers, in a region, it is unlikely that the region will experience rain. There must be a source for water to evaporate from into the air before that water vapor can rain back down. This is why deserts experience very little rainfall. The winds must carry water-rich air into the desert for there to be rainfall.

The rain shadow effect is an example of how regional topography (hills and valleys) can also effect the amount of rain an area receives. If there is a hill or mountainous region near a water source, the wind carries rainclouds toward the mountains but cannot carry them over the mountains. As a result, one side of the mountainous area is well vegetated and moist from the rain, and the other is rain deprived and very dry. The dry side is the “rain shadow.”