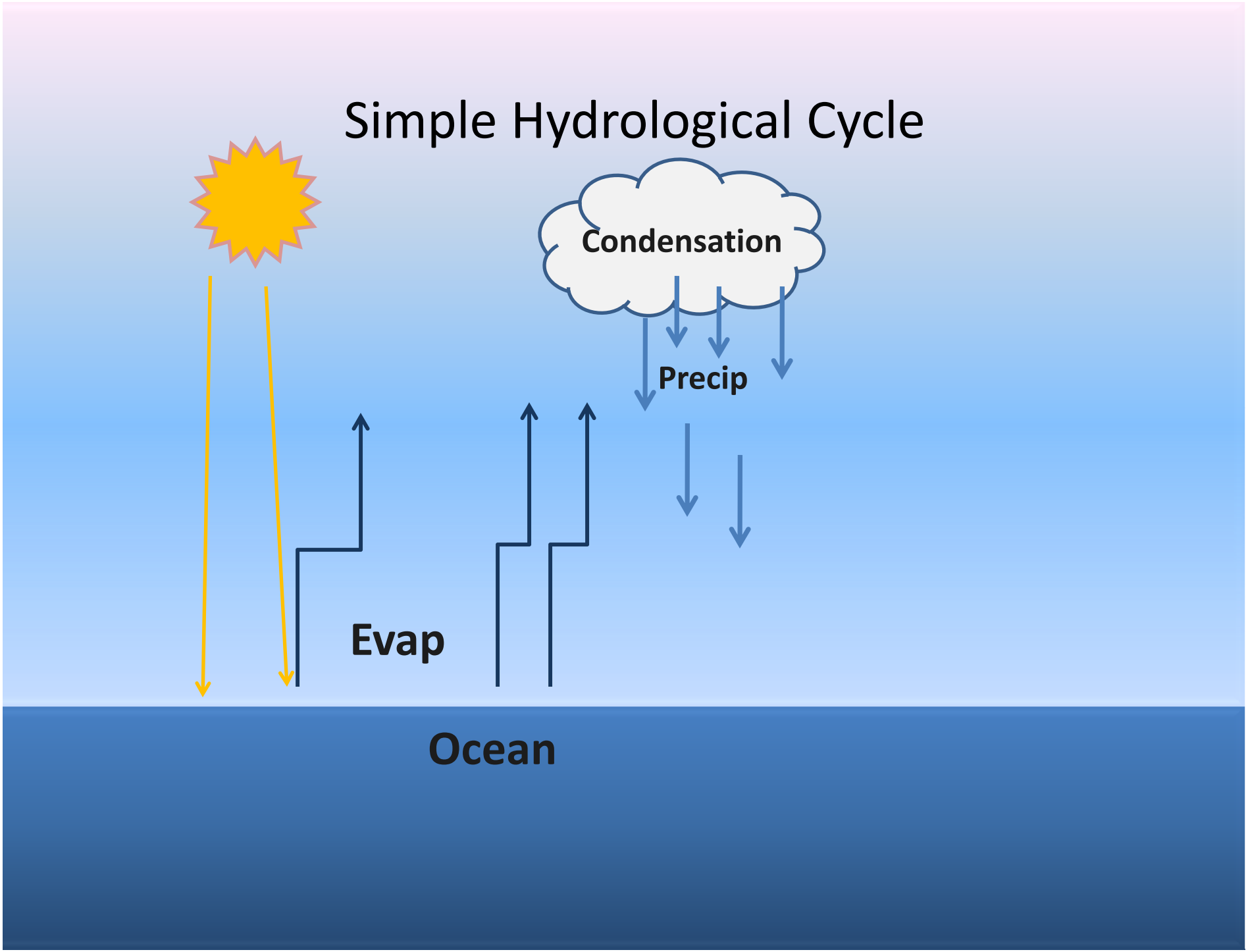
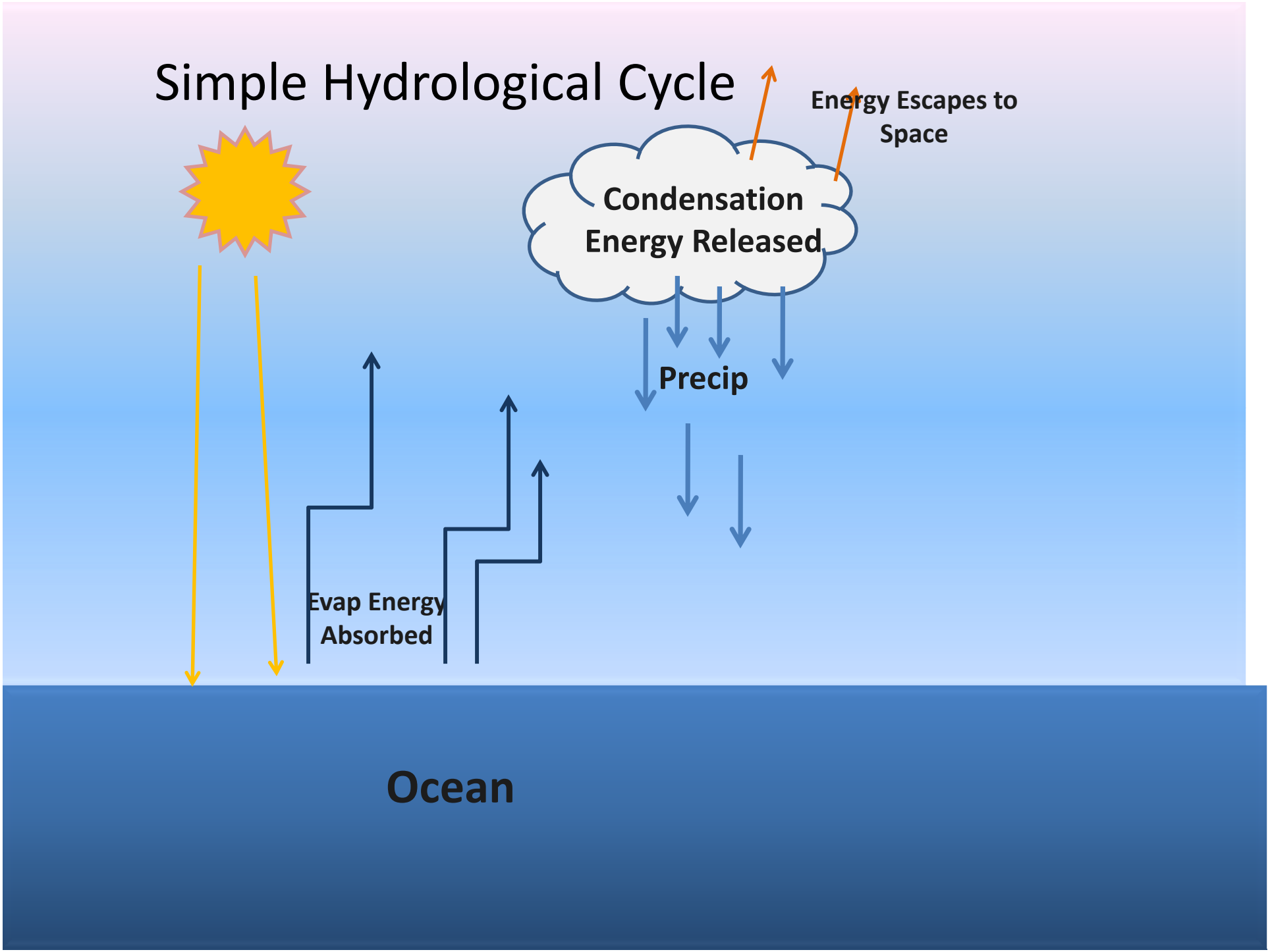
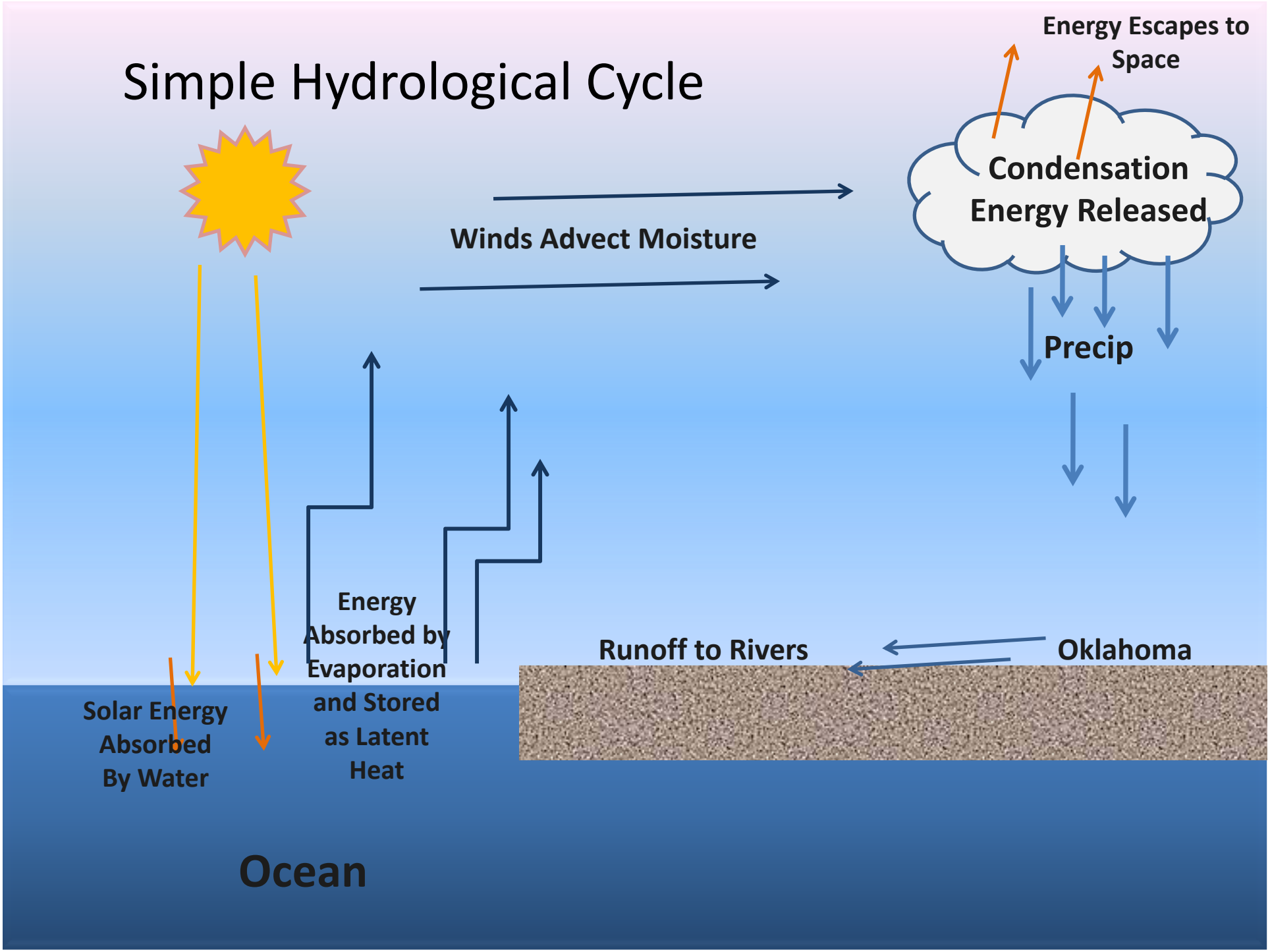
Spring, 1983, was the last time Lake Mead was full and water was going over the spillway. In September, 2007, it was down 118 feet.

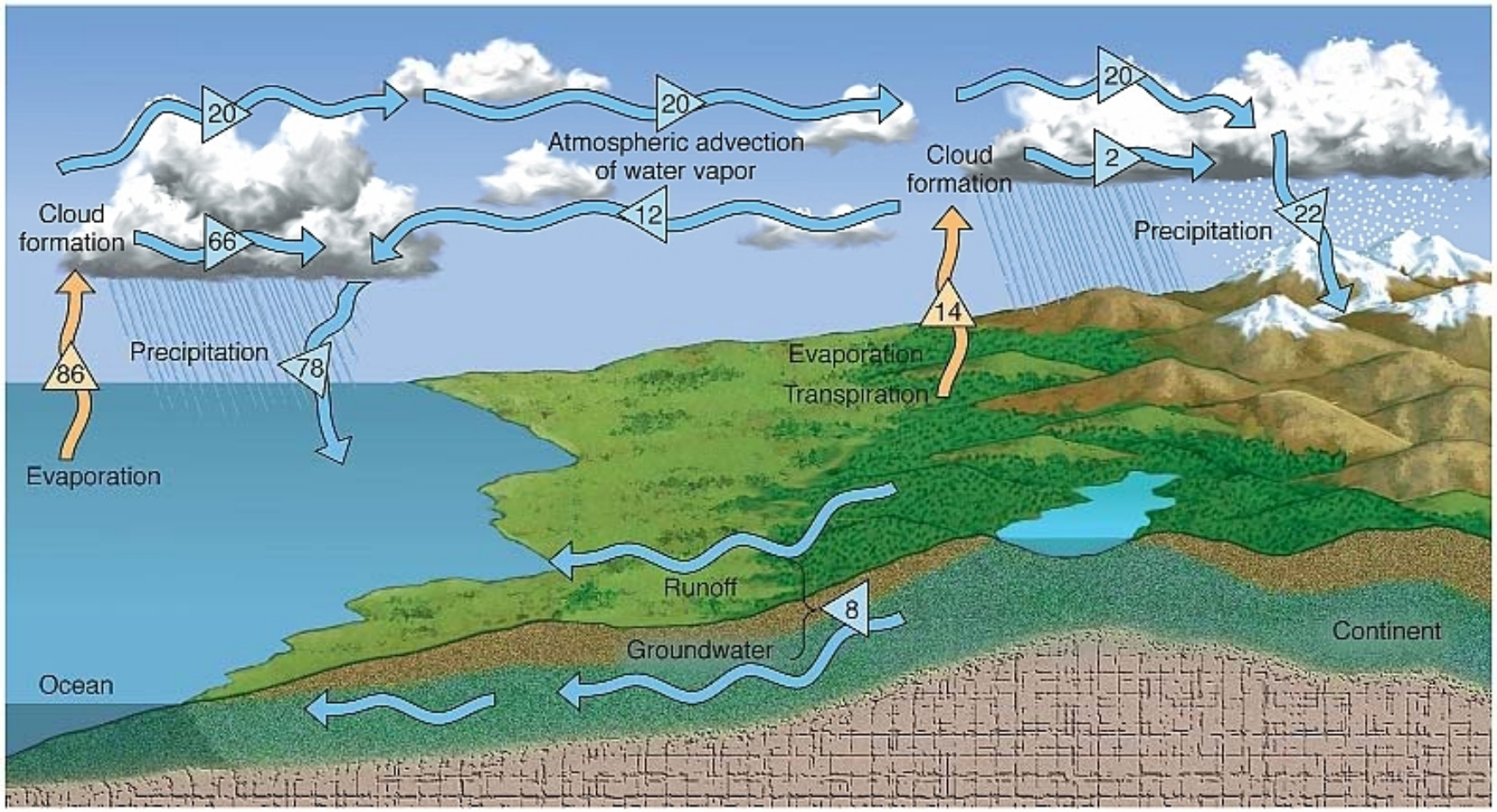
# Simple Hydrological Cycle




Simple Hydrological Cycle
Energy Escapes to Space
Condensation Energy Released
Precip
Evap Energy Absorbed
Ocean

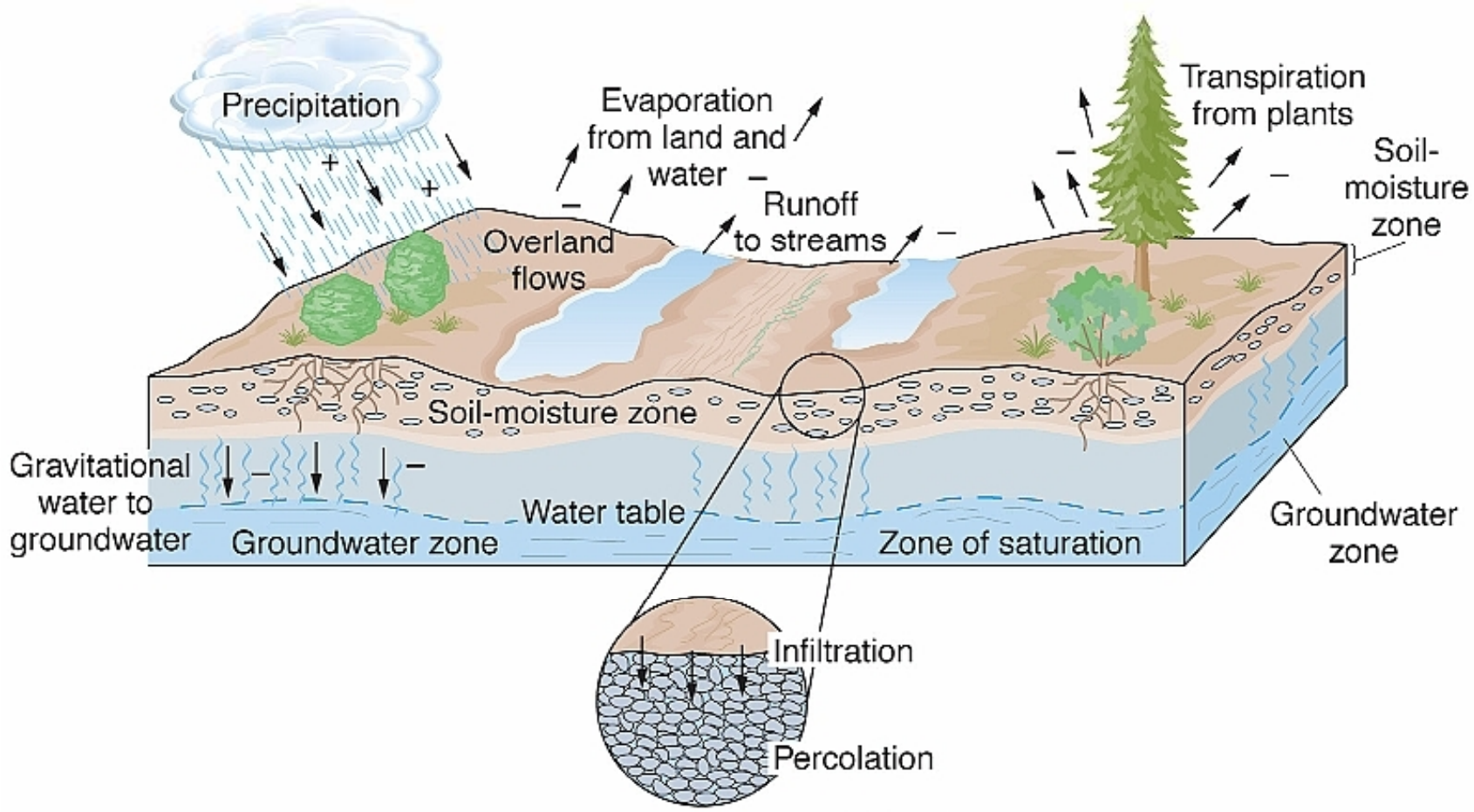

Simple Hydrological Cycle
Energy Escapes to Space
Condensation Energy Released
Winds Advect Moisture
Precip
Energy Absorbed by Evaporation and Stored as Latent Heat
Runoff to Rivers
Oklahoma
Solar Energy Absorbed By Water
Ocean

# Hydrological Cycle
# Values in Percent




(a)

# The Soil Moisture Environment

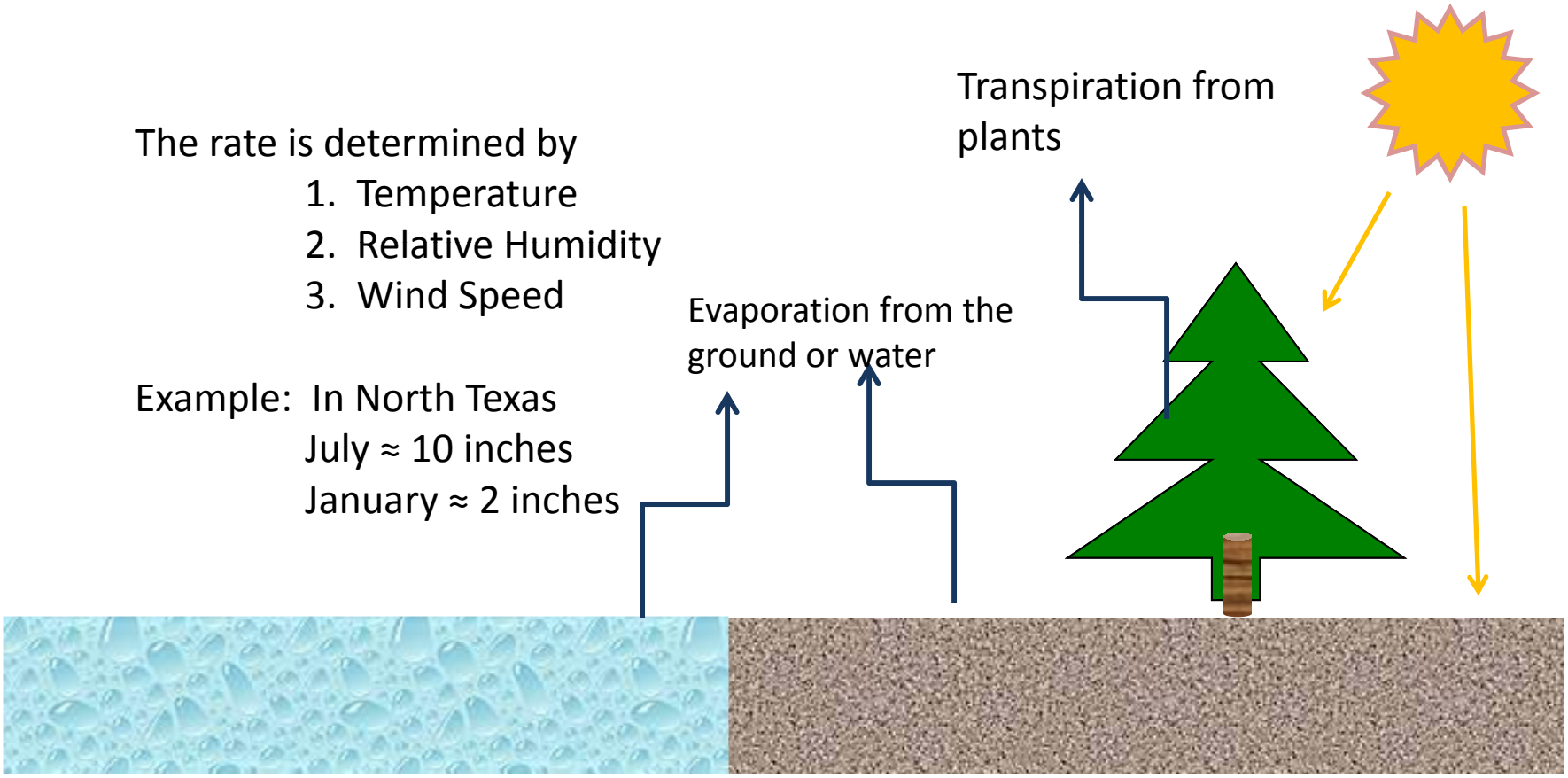


# Potential Evapotranspiration Is a Measure of the Amount of Water that Could Be Evaporated and Transpired If the Water Were Freely Available

The rate is determined by

1. Temperature
2. Relative Humidity
3. Wind Speed

Example: In North Texas
July ≈ 10 inches
January ≈ 2 inches



# Actual Evapotranspiration Is the Amount of Water Actually Evaporated into the Air

A plant, anchored in the ground, is trying to get enough water supply to equal the demand for water that the atmosphere places on it.

In North Texas, July demand can be 10 inches but July precipitation might just be 2 inches; so, the plant either gets by on less or dies.

Examples of annual averages:

Yuma, AZ $\frac{AE = 8 \text{ in.}}{PE = 80 \text{ in.}} = \frac{1}{10} = .1 = 10\%$ desert

Amarillo, TX $\frac{AE = 20 \text{ in.}}{PE = 60 \text{ in.}} = \frac{1}{3} = .333 = 33\%$ short grass

Knoxville, TN $\frac{AE = 60 \text{ in.}}{PE = 50 \text{ in.}} = \frac{6}{5} = 1.2 = 120\%$ forest

# Desert of Southern Arizona
# Moisture Demand Exceeds Supply by 10:1.

(a)

# Short Grass Prairie of Great Plains
# Sometimes Called Sub-humid
# Moisture Demand Exceeds Supply by 3:1.


(d)

# Forest of Appalachian Mountains in Eastern Tennessee

(a)

Large Trees are the Dominant Vegetation in the Appalachians Where Rainfall is Plentiful. Here Moisture Supply Actually Exceeds Supply Slightly.