

# CLIMATE

Name \_\_\_\_\_

**INTRODUCTION:** Climate is defined as *the average weather of a region over an extended period of time*. Factors affecting climate include *precipitation, evapotranspiration, latitude, elevation, prevailing winds, ocean currents, and the presence or absence of nearby mountain ranges or large bodies of water*.

**Humidity:** the general humidity of an area can be determined by comparing (ratio) precipitation to evapotranspiration. Areas where precipitation is greater than evapotranspiration are relatively humid. Areas where evapotranspiration is greater than precipitation are generally arid. The chart at right classifies climates according to P/Ep ratios.

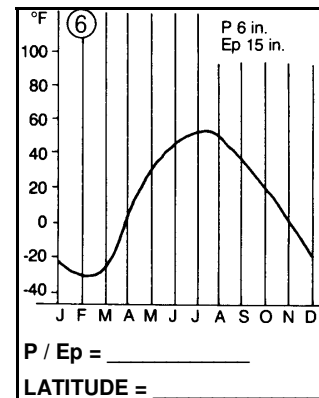
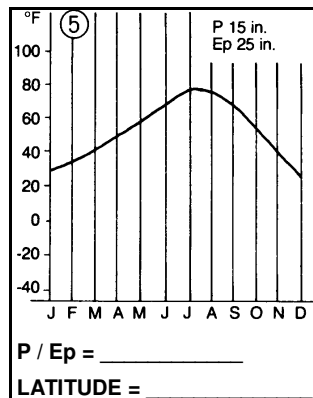
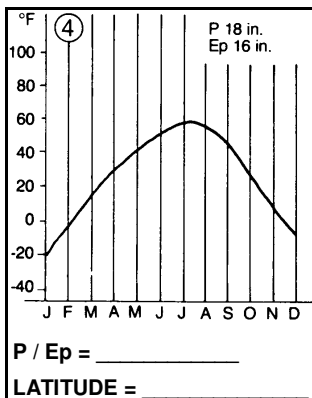
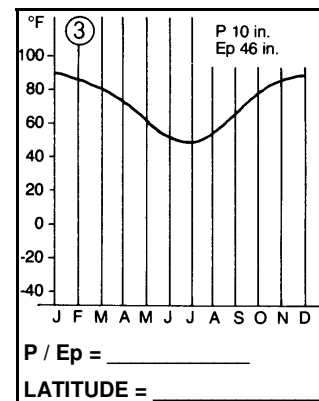
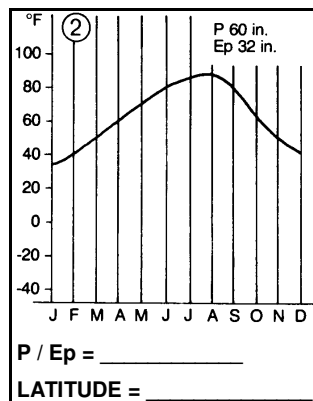
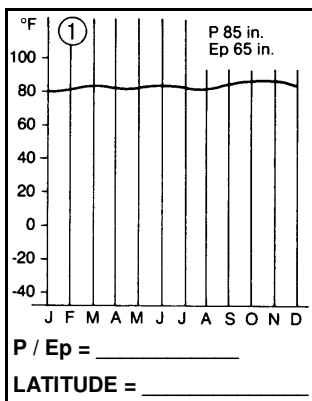
P / Ep Ratio	Climate
< 0.4	Arid
0.4 - 0.8	Semi-Arid
0.8 - 1.2	Sub-Humid
>1.2	Humid

1. Determine the P / Ep ratios and climates for the following regions.

REGION	Precipitation	Evapotranspiration	P / Ep Ratio	Climate
A	95cm	85cm		
B	30cm	90cm		
C	145cm	105cm		
D	45cm	70cm		

**Latitude:** As latitude increases, the average temp. decreases and the temp. range increases.

2. For each of the "climographs" 1 - 6 below, give the approximate latitude (note P / Ep).



**Elevation:** As elevation increases, the average yearly temperature decreases and precipitation increases.

3. Two cities are at the same latitude. City A is at 350 feet elevation, and city B is at 2,500 feet.

Which city has a warmer average temperature? \_\_\_\_\_

Which city has a wetter climate? \_\_\_\_\_

**Winds, Currents, Mountains & Water:** Because water has a higher specific heat than land, coastal locations have a narrower temperature range than continental locations. Planetary winds and ocean currents also affect climate by bringing tropical or polar air to a location. Winds and currents also affect the humidity of a location by bringing continental or maritime air to a region. And lastly, the presence of a mountain range can cause an orographic effect (a cool rain forest on the windward side and a hot, arid zone on the leeward side).

4. Using the Surface Ocean Currents map on page 4 of the ESRT, answer the following questions.

Salem, Oregon, (coastal city) and St. Paul, Minnesota (continental city) are both at around  $45^{\circ}\text{N}$ . Which city has colder winters and hotter summers?

The California Current brings ( WARMER / COOLER ) air to Southern California.

The Gulf Stream brings ( WARMER / COOLER ) air to the Connecticut coast.

The North Pacific Current brings ( MOISTER / DRYER ) air to Northern California.

Eureka, CA is on the Pacific Coast at about  $40^{\circ}\text{N}$ . Redding, CA is on the other side of the Coast Range of mountains at about the same latitude. Which city is moister?

Joao Pessoa, Brazil is at the eastern tip of South America at about  $8^{\circ}\text{S}$  latitude. From which direction do its winds come?

Oswego, NY, located on the southeast end of Lake Ontario, receives lots of "lake effect" snow. Explain how lake effect snows form.

**Earth's Tilt:** Earth's axis is tilted with respect to the plane of its orbit by about  $23.5^{\circ}$ . This causes seasonal changes in weather that are opposite in the Northern and Southern hemispheres.

Explain what the effect would be if the Earth's axis were tilted  $35^{\circ}$ .

Explain what the effect would be if the Earth's axis were not tilted at all.