

Name: \_\_\_\_\_

## Homework #1: Exploring Different Biomes

**Step 1:** go to <https://www.hhmi.org/biointeractive/biomeviewer> and click on the map to download the biome viewer app. You can use also download an iPad version from the App Store.

**Step 2:** Explore the app. Click and hold the globe to spin it and explore different parts of the world. You can click and release a spot on the globe to drop a pin there to see a summary of the characteristics of the biome for that location. You can also search for locations by name, latitude/longitude, or zip code. In the biome summary panel, click on “More” to see a longer description, photos, a larger climate graph, and wildlife data. You can also compare the two different areas or biomes by clicking on the “Compare” tab to view details on two biomes side by side. In the biomes legend, use the arrows at the top to see different layers including anthromes (landscapes created by humans), temperature, precipitation, and terrain. You can add gridlines and political boundaries by clicking on the gear icon. You can also click on the globe icon to switch between a spherical view and a flat projection of Earth.

**Step 3:** Use the BiomeViewer app to answer the questions below

### INTRODUCTION

Biomes are areas that are defined by the climate (temperature and precipitation) within a given area. The climate of an area determines the types of plants and animals that can survive and thrive within that area. Both plants and animals have adaptations that allow them to survive better under certain conditions, however some plants and animals require certain conditions in order to survive. For example, amphibians have soft jelly-like eggs that must be laid in water or they will dry up. Mammals have hair or fur and are endothermic, which means they generate their body heat internally. Reptiles are covered with scales and are ectothermic, which means they do not generate heat internally and rely on the temperature of the external environment to control their own body temperature. These physiological differences between amphibians, reptiles, and mammals are reflected in the distribution of these different groups of animals in the different biomes on earth.

### BIODIVERSITY AND LATITUDE

1. Drop the pin on any point in one of the biomes listed in Table 1 below and record the following:

**Table 1. Characteristics of some representative biomes.**

<b>Biome</b>	<b>Latitude</b> (Degrees N or S)	<b>Amphibians</b>	<b>Reptiles</b>	<b>Mammals</b>	<b>Total Species Richness</b>
Tundra					
Boreal Forest					
Temperate Deciduous Forest					
Desert					
Tropical Rain Forest					
Alpine					

1. What trends in total species richness do you notice as you move toward the equator? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. Which biome had the greatest number of amphibian species? Which had the least? Why do you think amphibians are more common in some biomes than others? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. Which biome had the fewest reptile species? Why do you think reptiles are uncommon in this biome? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### **EXPLORING CALIFORNIA BIOMES**

1. Type “Los Angeles” into the search area in the top right corner.

a. What type of biome is Los Angeles found in? \_\_\_\_\_

2. Click on the “More” information tab in the lower left corner, then select the “Climate” tab to view an enlarged version of the climatograph.

a. What month has the lowest average temperature and what is the lowest average monthly temperature?  
\_\_\_\_\_

b. What month has the highest average temperature and what is the highest average temperature?  
\_\_\_\_\_

c. What month has the highest average precipitation, and how much precipitation falls in that month?  
\_\_\_\_\_

3. Click on the “Wildlife” tab in the top right corner

a. How many species of mammals \_\_\_\_\_, amphibians \_\_\_\_\_, and reptiles \_\_\_\_\_, are found in the chaparral biome in Los Angeles

4. Type “Mammoth Lakes” into the search area in the top right corner.

a. What type of biome are the Mammoth Lakes found in? \_\_\_\_\_

5. Click on the “More” information tab in the lower left corner, then select the “Climate” tab to view an enlarged version of the climatograph.

a. What month has the lowest average temperature and what is the lowest average monthly temperature?  
\_\_\_\_\_

b. What month has the highest average temperature and what is the highest average temperature?  
\_\_\_\_\_

c. What month has the highest average precipitation, and how much precipitation falls in that month?  
\_\_\_\_\_

6. Click on the “Wildlife” tab in the top right corner

a. How many species of mammals \_\_\_\_\_, amphibians \_\_\_\_\_, and reptiles \_\_\_\_\_, are found in the chaparral biome in Mammoth Lakes

7. Type “Palm Desert” into the search area in the top right corner.

a. What type of biome is Palm Desert found in? \_\_\_\_\_

8. Click on the “More” information tab in the lower left corner, then select the “Climate” tab to view an enlarged version of the climatograph.

a. What month has the lowest average temperature and what is the lowest average monthly temperature?

\_\_\_\_\_

b. What month has the highest average temperature and what is the highest average temperature?

\_\_\_\_\_

c. What month has the highest average precipitation, and how much precipitation falls in that month?

\_\_\_\_\_

9. Click on the “Wildlife” tab in the top right corner

a. How many species of mammals \_\_\_\_\_, amphibians \_\_\_\_\_, and reptiles \_\_\_\_\_, are found in the chaparral biome in Palm Desert

## COMPARING BIOMES

Change the view to a flat map and turn on the gridlines. Click on the boreal forest in Canada then click the “compare” button on the bottom of the new window. Once you click the compare button select the tropical rain forest in Brazil. Then, answer the following questions:

a. How do rainfall and temperature patterns differ between the two biomes? \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

b. Which of these two biomes have a more stable environment for the organisms living within each biome? \_\_\_\_\_

\_\_\_\_\_

Type Los Angeles into the search bar and then hit the compare button again. After selecting the compare button, click on the chaparral biome in southern Italy, then answer the following questions.

a. How do the rainfall and temperature patterns compare between the chaparral biomes in California and Italy?

\_\_\_\_\_  
\_\_\_\_\_

b. Select the wildlife tab, then select the mammals at each location. Besides the bat species, list four species found in Italy that are similar to mammals found in the chaparral biome in California. (Ex. California vole and the European water vole)

California Chaparral Species	Italian Chaparral Species

### HUMAN IMPACTS ON BIOMES

While centered over North America, change to the layer from the Biome layer to the Anthromes layer on the top left. After selecting the Anthromes layer select the year 1700. Anthromes are anthropogenic or human created biomes.

a. Type Temecula in to the search bar, then list the Anthromes at this location for each of these years:

1700: \_\_\_\_\_

1800: \_\_\_\_\_

1900: \_\_\_\_\_

2000: \_\_\_\_\_

b. Describe the changes that occurred in California from 1700 to 2000. \_\_\_\_\_

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