THE COLORADO RIVER STORY

For Teachers (Don't print this page)
Suggested complimentary lessons:
- Part I: Who needs water? - Jigsaw reading
- Part III: What happens when demand exceeds supply? - Data analysis workbook

Students Learning Objectives
- Students will visualize and map the most important southwestern watershed
- Students will create their own methods for plotting map data
- Students will make connections between altitude, geography, precipitation & streamflow

Age & topic
- Upper middle and high school - earth science

Time
- 1-1.5 class periods

National Standards
- D: Earth Science
- F: Science in Personal and Social Perspectives

PART II. How does geography play a role in water distribution?

In order to understand the dynamics of water and issues relating to the Colorado River watershed, students will make map models of stream flow and precipitation including population of cities and towns in and around the Colorado River Basin.

Materials:
- Colored pencils and/or markers
- Table 1: Average Annual Flow Rates (following page)
- Table 2: City population and average precipitation (following page)
- Map of the southwest U.S. (following page)

Directions:
Intro: Begin with a classroom guided brainstorming discussion using these prompts: (You may want to provide pictures of rivers and basins)
- Where does your water come from?
- How does changing altitude/elevation affect a river
- What are different kinds of precipitation?
- Where does precipitation happen most and least?
- Is population evenly distributed across the U.S.?

Activity: Where does freshwater come from and where do people live?
1. Print the following three pages for each student.
2. Directions for mapping and questions for connecting the data plotted on the map are included.

Where does freshwater come from and where do people live?

- Rivers and towns in and around the Colorado River basin are already labeled on the map provided.
- Plot the information from Tables 1&2 on the map by choosing symbols to represent streamflow, population and precipitation.
- For example, you may choose to use a blue dot to indicate 1 million acre feet (MAF) and a red dot to indicate 500,000 million acre feet (MAF). Therefore, next to Colorado River at the Mexico border you would put 1 blue dot and 1 red dot. Then you would choose a different symbol to represent population and precipitation.
- Make a legend for your symbols.
- Answer questions about your map.

Table 1: Average annual streamflow in million acre-feet* (MAF) for 1979-2009

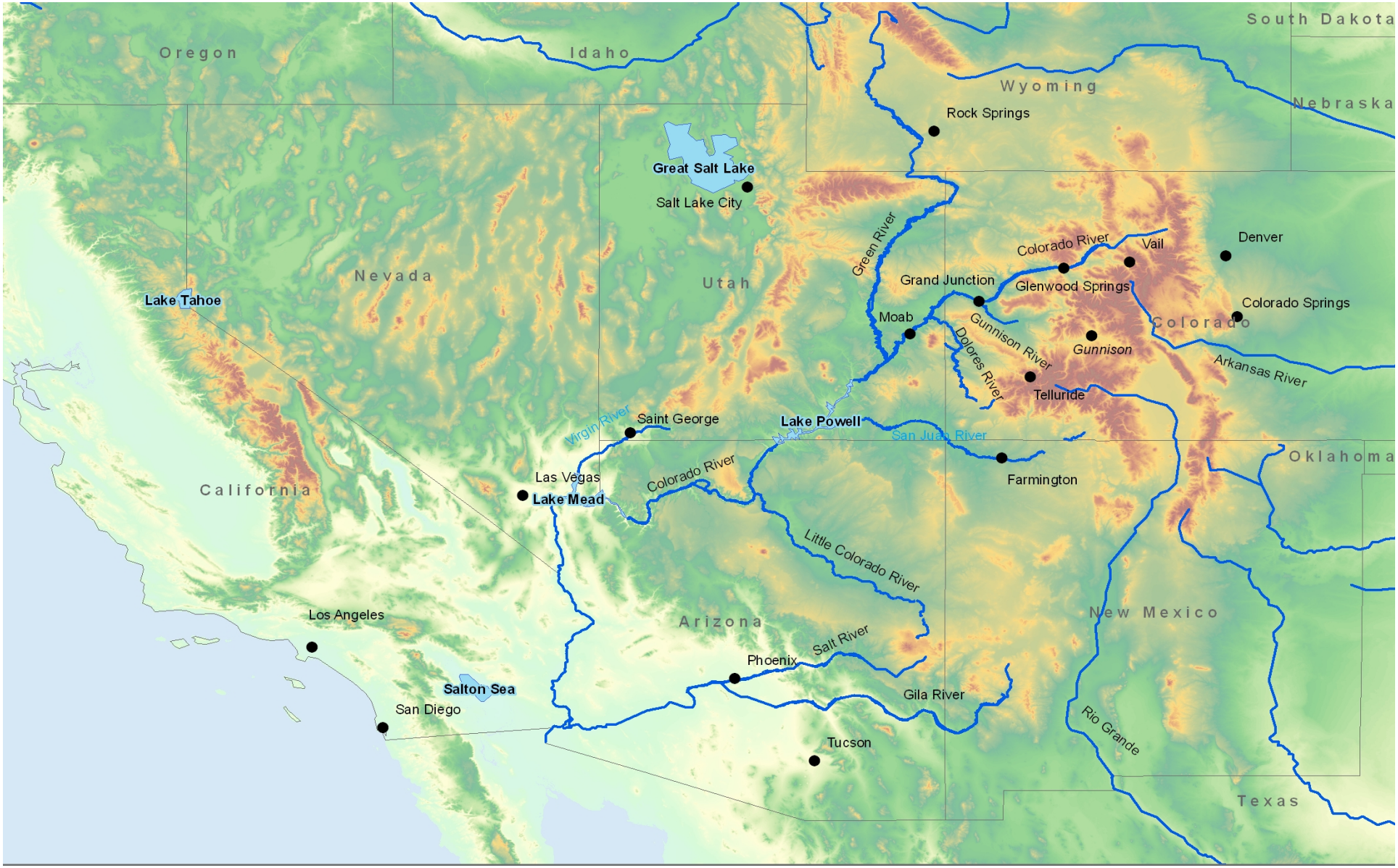
CO River at CO/UT border	5
Green River	4
San Juan	2
Inflow at Lake Powell	11
CO River at Mexico border	1.4

*1 million acre-foot is how much water it would take to flood an acre of land with a foot of standing water

Table 2: Population (2010) & average precipitation for the Colorado River Basin

City	State	Population	Precip. (in)
Phoenix	AZ	1,445,632	8.3
Tucson	AZ	520,116	11.9
Los Angeles	CA	3,792,621	15.1
San Diego	CA	1,307,402	12
Denver	CO	600,158	15.8
Glenwood Springs	CO	9,614	9
Gunnison	CO	5,854	9.9
Telluride	CO	2,303	23.5
Vail	CO	4,531	22
Las Vegas	NV	1,375,765	4.5
Farmington	NM	45,877	8.4
Moab	UT	4,779	9.02
Salt Lake City	UT	186,440	17.7
St. George	UT	72,897	8.3
Rock Springs	WY	20,905	8.7

Table 1 Streamflow data, courtesy of Dr. David Yates, NCAR/UCAR
Table 1 Populaton data courtesy of wikipedia.com
Table 2 Precipitation data courtesy of usclimatedata.com



Legend

- Cities
- Major Rivers
- Major Lakes

Elevation (m)

High : 6,098 meters

Low : 0 meters

South West United States of America

N

0 100 200 400 Miles

Refer to your map to answer the following questions with complete sentences. Name: Period

1. What does the color-shading on the map indicate? How does it change through the river basin?

2. What do the headwaters for all the rivers on the map have in common?

3. Does the Colorado River flow past Denver? Which direction does the Colorado River flow?

4. Which direction does the Arkansas River flow? How can you tell?

5. Where is the precipitation the highest? Where is precipitation the lowest?

6. Where is population the highest on your map? Is this the same area where the streamflow is highest?

7. In a sentence or two, explain the role of geography in natural water distribution according to your map.