

APES- Water Diversions

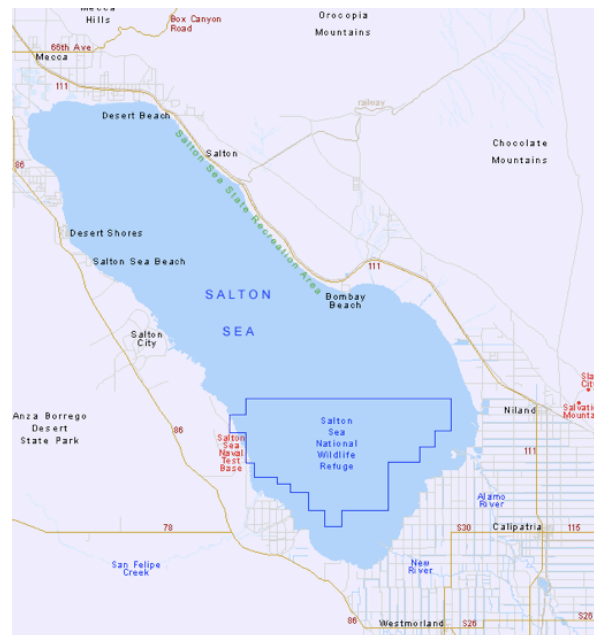
Name: _____

Purpose: Conduct research to analyze the effects of water diversions on surrounding ecosystems and human communities. **Compare and contrast** the problems and successes of various water diversions and describe possible remediations.

Introductions: Humans have been diverting water for irrigation, flood control, and a constant drinking supply for thousands of years. When populations were small, the diversions were small. Over the last 150 years, human populations have grown rapidly and our technical abilities have vastly improved. These two changes, worldwide, have led to many large-scale projects that have altered the environment of sizable regions. This investigation focuses on three major water diversions: **The Salton Sea, Lake Chad, Aral Sea, Mono Lake, Yangtze River, and The Colorado River.**

Salton Sea

1: Describe the location of the **Salton Sea**. What is the climate and geography of the area?



2: How did the *Salton Sea* form?
Explain what role humans played.

3: What is the present condition of this body of water? **How has it changed over the last 25 years? Why?**

4: Describe several ways the Salton Sea has altered the ecosystem of the region. *Explain the stability of that ecosystem. How is it changing over time?*

5: Outline **3 environmental and 3 economic reasons** the Salton Sea is important.

6: What steps are being taken to **remediate** the Salton Sea? *What are the chances of success? Explain.*

7: Compare the **similarities and differences** between the Salton Sea and Lake Chad in Sub-Saharan Africa. **(Make a VENN Diagram)**

The Aral Sea

1: **Where** is the Aral Sea located?

2: **Which rivers** mainly supply the Aral Sea?

3: **What government agency** is responsible for the Aral Sea and its plight?

4: Why was the water supply to the Sea *diverted*?



5: **What resources** did the Aral Sea supply to the local inhabitants?

6: Describe **3 negative environmental** effects of the fading of this sea.

7: Describe **3 economic impacts** in the region because of the water diversion.

8: How is the situation of the Salton Sea *similar* to the Aral Sea? *How is it different*?

9: How would you describe this region today, *other than as a "sea"*?

10: Explain **five health effects** on people related to the vanishing Aral Sea.

11: **How** can the Aral Sea be *realistically rehabilitated*?

12: **Compare** the situation in *Mono Lake, California* with that of the *Aral Sea*

- How did the Mono Lake problem arise?
- Describe 3 ways the problems of Mono Lake are similar to those of the Aral Sea
- Outline three ways the problems of Mono Lake differ

13: Summarize the **proposal and actions** to remediate Mono Lake

Colorado River Basin

1: Compare water diversion influences on the Colorado River with those on the Salton Sea and the Aral Sea. *Describe three ways they are different.*

2: **Look at the map-** *Where is the source of the Colorado River?*

What are some of the main tributaries and their source?

What is the most important origin of the water in the Colorado River?

3: **Politics:** Who decides where the water in the river system goes? *How is the resource divided between the various states in the watershed and beyond?*

4: How do the individual states use the water? *Who are the top five consumers of the water?*

5: Describe some of the conflicts that arise over water use. *How are they usually resolved?*

6: How are conflicts between *public and private use* managed?

7: Serious differences with Mexico exist concerning the amount of water the Mexicans receive from the river. *Explain why this problem exists and what can be done to work out this dispute between the countries.*



8: The Tigris and Euphrates Rivers cross international boundaries in their path to the Persian Gulf. *Why is this problem potentially greater than the one that exists on the Colorado River?*

9: Compare the problem of water diversions on the *Yangtze River in China* with those of the Colorado River.

10: The **Three Gorges Dam** on the Yangtze River is very controversial. *Why is this dam being built?*

11: **Describe how this dam differs** from dams on the Colorado River, such as the Glen Canyon Dam or Hoover Dam, with respect to:

- *the disruption of human life*
- *impact on the environment*
- *archaeology*
- *local culture and natural beauty*

Water Diversion- FRQ

Q: *The Colorado River runs 1,450 from the headwaters of the Rocky Mountains to the Gulf of California. The primary source of Colorado River water is melting Rocky Mountain snowpack. Once the river descends from the Rockies, it flows through a landscape that is dominated by desert. Colorado River water carries a high load of*

sediment. The river has many dams, aqueducts and canals that divert the water in order to supply for electricity, irrigation, recreation, and domestic use.

*a: Describe and discuss **two environmental issues** associated with water diversion projects. **Identify two benefits** other than agriculture and recreation that people derive from that system of dams.*

*b: If there is a shortage of water, decisions will have to be made as to whether the water should be diverted to urban areas, agricultural areas, or natural ecosystems. **Make an argument for diverting water for urban consumption, and an argument for permitting the water to flow to natural areas.***

*c: Identify another example (other than the Colorado River) of a large-scale water diversion project. **Discuss two environmental problems that have resulted or might result from this project.***

*d; Identify **two possible environmental consequences of climate change** on the hydrology of the Colorado River system.*

*e: In addition to impacts on the Colorado River system, climate change is impacting the hydrology of coastal ecosystems. **Identify and describe TWO possible consequences of climate change on coastal ecosystems.***