

# Texas Water

**Prepared by:** Barbara Woolsey

**Description:** This is a series of activities designed to introduce students to Texas water facts and water issues.

**Grade Level:** Secondary

**Learning Outcome:** When my students finish this lesson, they will be able to identify the major rivers and aquifers in Texas, to describe the distribution and uses of water in Texas, and to become aware of the need to use water wisely.

**Essential Elements for World Geography:**

Content - 1b, 2b, 2c, 3a, 3b, 3d, 4f

Attitudes, Values, and Skills - 2c, 2e, 2f, 2h, 2k, 3e, 4a, 4b, 4c, 4f, 4g, 4i, 4m

**Fundamental Themes:**

Location

Place

Human and Environmental Relationships

Movement

Regions

**Related Learning Outcomes:**

Music - find songs with the names of Texas rivers in them

Math - create a graph showing the uses of water in Texas

Science - create a model of an aquifer

Computer literacy - project water usage in Texas for the next 50 years

Art - create a poster showing the hydrologic cycle

**Classroom Procedure:**

Day 1: Pass out *Texas Water Facts* and assign reading

Day 2: Define significant vocabulary

Day 3: Identify major rivers and basins in Texas

Day 4: Play Wally the Water Wizard

**Materials:**

*Texas Water Facts*

map of Texas

colored pencils

**Evaluation:**

Teachers may grade each of the three lessons separately, collectively as a series of lessons, or in some other appropriate process.

**Extension:**

Students may visit the water treatment facility in their area and evaluate the facility.

Students may become involved in a water watcher activity.

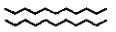
Students may become active in promoting water conservation in their school and community.

# Texas Water Vocabulary

Use *Texas Water Facts* to define the following terms.

1. precipitation
2. hydrologic cycle
3. surface water
4. run-off
5. acre-foot of water
6. conservation storage
7. dependable yield
8. aquifer
9. ground water
10. conjunctive use
11. mining
12. recharge
13. subsidence
14. bio-remediation
15. bioassay
16. water quality
17. contaminant
18. pollutant
19. point source pollution
20. non-point source pollution
21. tinajas
22. playa lakes
23. desalinization
24. estuary
25. colonias

# Texas Rivers and Basins

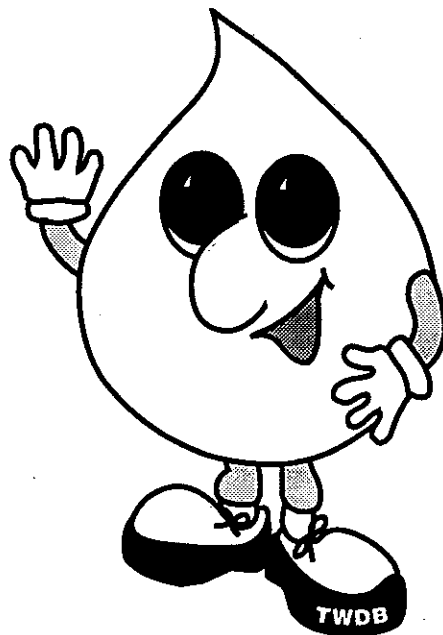
On the map of Texas, label each of the major rivers of Texas. Then using information in *Texas Water Facts*, draw the boundaries for the various river basins. Color code each of the basins creating your own legend. Use this symbol  to denote river basin boundaries.

## Major rivers:

Brazos  
Canadian  
Colorado  
Cypress  
Guadalupe  
Lavaca  
Neches  
Nueces  
Red  
Rio Grande  
Sabine  
San Antonio  
San Jacinto  
Sulphur  
Trinity

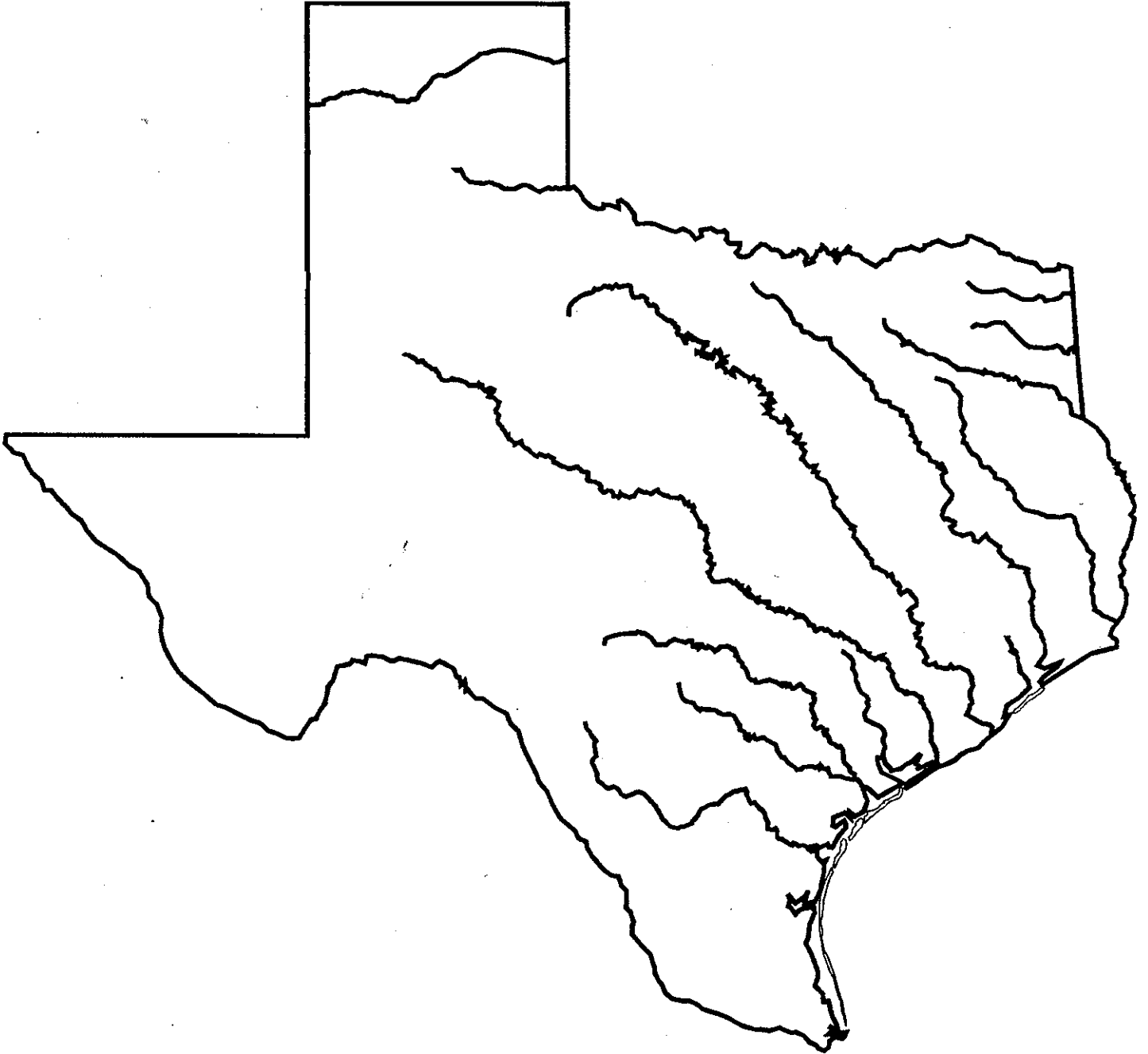
## River basins:

Brazos  
Canadian  
Colorado  
Cypress  
Guadalupe  
Lavaca  
Neches  
Nueces  
Red  
Rio Grande  
Sabine  
San Antonio  
San Jacinto  
Sulphur  
Trinity

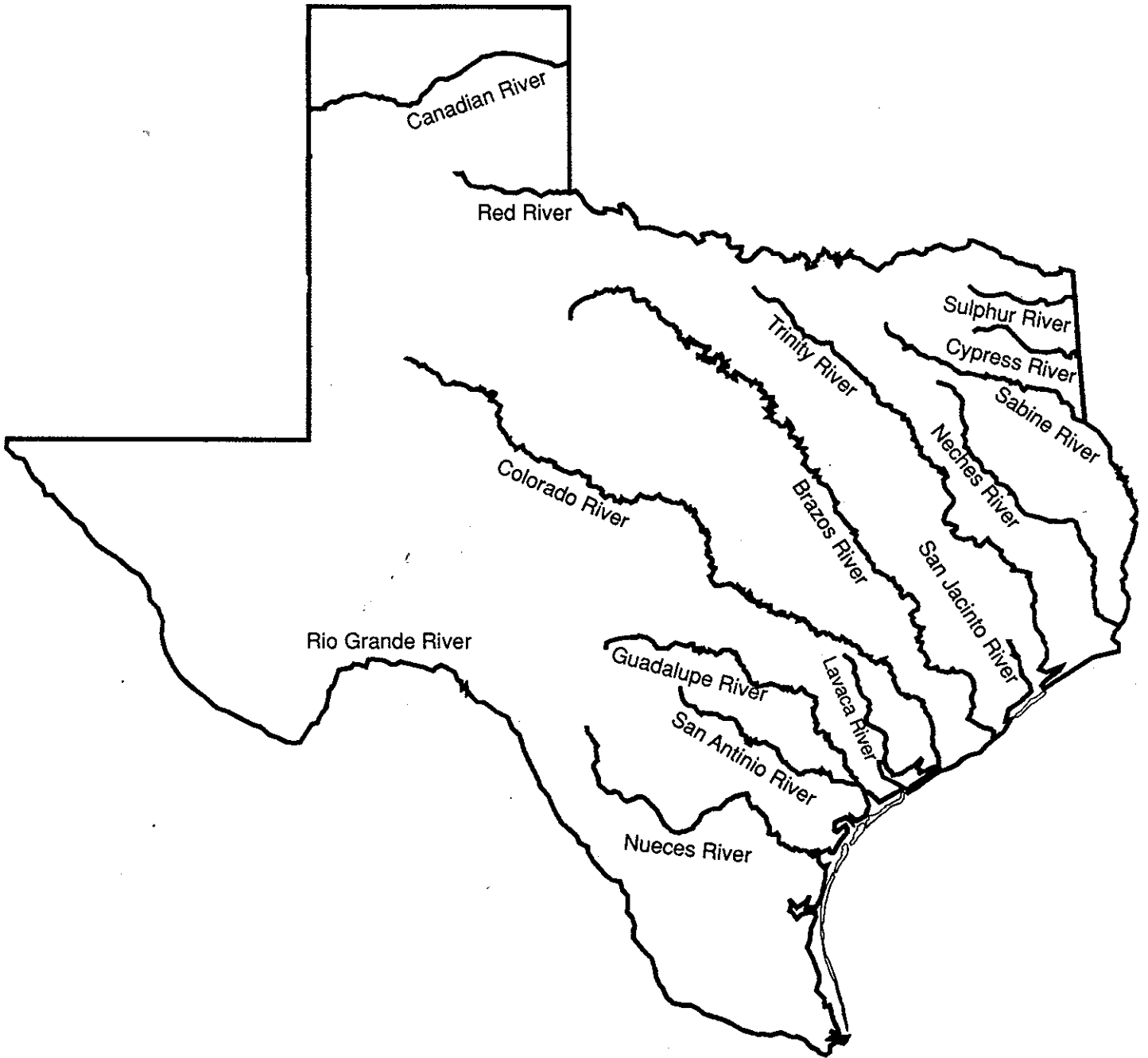


Wally Water

# Texas Rivers



# Texas Rivers



# Texas Water Wizards Competition

## **Classroom Procedure:**

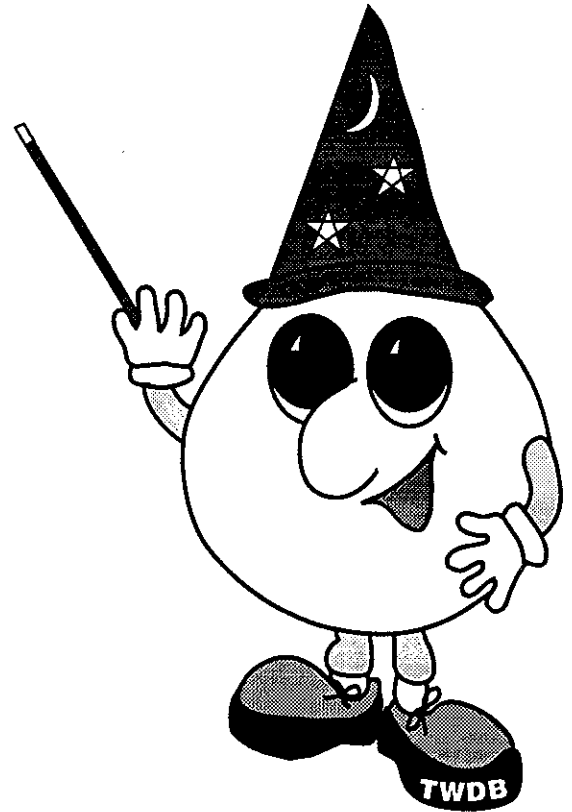
1. Divide class into teams by having students count off - 1,2,3,4; 1,2,3,4, etc.
2. Even numbers (2's and 4's) will be a team challenging the odd numbers (1's and 3's).
3. Pass out instructions to each team. (It may be a good idea to elect a team captain who will write the answers and deliver them to the teacher.)
4. Explain to students that working together as a team, they must answer questions concerning Texas water facts. As they finish a series of questions, they are to turn them in to be checked. If all questions are answered correctly, the team will receive another set of questions to answer. Four sets of questions must be completed. When each set is successfully answered, the team will receive a rain, sleet, snow, or hail card. Team members may use *Texas Water Facts* or any other resources available in the classroom.
5. To win, a team must earn a rain card, a sleet card, a snow card, and a hail card.
6. The first team to collect all four cards wins. The teacher may award five bonus points on the next test to each member of the winning team, or some other appropriate award.

**Note:** There are some questions which pertain to each teacher's individual location. The teacher will need to research the answers.

Also, the teacher may want to appoint two students to serve as checkers so that one team is not held up because the teacher is checking the other team's work. (May want to draw names for checkers and give them an automatic five-point bonus for serving as checkers.)

# Wally The Water Wizard

Wally the Water Wizard was meandering about Texas when he was captured by Dry Dirt Dirk (an agent of D.R.I.P). Dry Dirt Dirk wants to bring a lake to a dry, barren wasteland, sell lakefront property, and make millions. Dry Dirt Dirk is ruthless. He has no concern for water quality or conservation. His motto is, "It's my water!" Wally the Water Wizard is helpless to halt the devastation caused by Dry Dirt Dirk. Only you can recapture the water of Texas. If you are lucky, along the way you may be able to educate Dry Dirt Dirk about water conservation.



Good luck!

You must answer a series of questions. After you complete a series, turn in your paper to your teacher. If you answer all your questions correctly, you will be given either a RAIN, SNOW, SLEET, or HAIL card and the next series of questions. Before you receive your RAIN questions, answer the two questions given below. Once completed, turn them in to your teacher for your RAIN questions.

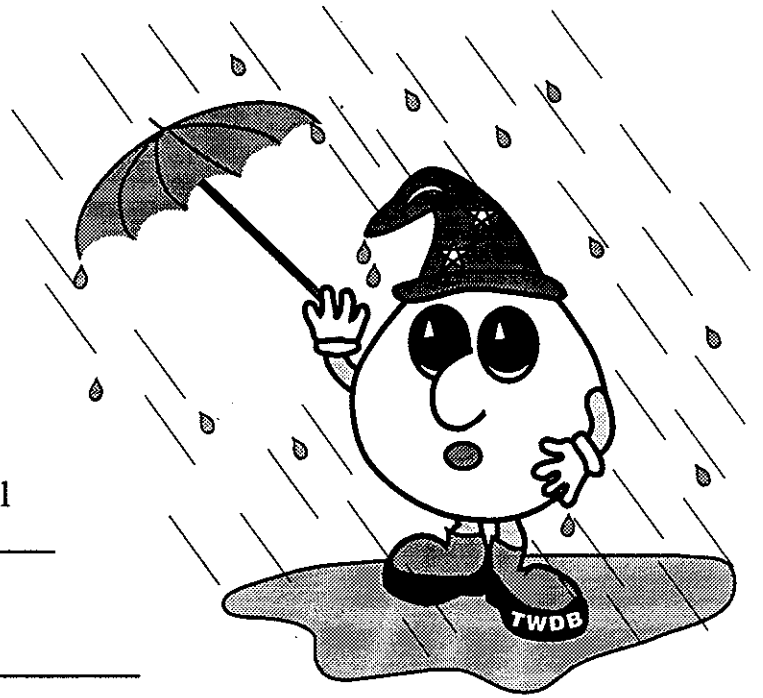
1. Name the major river which is closest to your community.

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2. Determine the greatest use of water for your area.

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# Rain



1. What is the average annual rainfall for El Paso? \_\_\_\_\_
2. How many reservoirs are in the Texas river system? \_\_\_\_\_
3. Which major river in Texas is the only one that is part of the Mississippi drainage basin? \_\_\_\_\_
4. How many acre-feet of surface water does Texas use each year? \_\_\_\_\_
5. What made settlement possible in many areas of Texas that had no other reliable source of water? \_\_\_\_\_
6. Why will it cost Texans more money to finance water projects for the next 50 years? \_\_\_\_\_
7. Which spring feeds the state's largest outdoor swimming pool in Balmorhea State Park? \_\_\_\_\_
8. Why is there a boundary dispute between Texas and Oklahoma?  
\_\_\_\_\_
9. Which lake in Texas has the highest capacity and is shared with Oklahoma?  
\_\_\_\_\_
10. The Gulf Intracoastal Waterway extends from \_\_\_\_\_ to  
\_\_\_\_\_, \_\_\_\_\_.
11. What wildlife refuge provides the only wintering grounds for the endangered whooping crane? \_\_\_\_\_
12. Why is education important to water? \_\_\_\_\_



# Hail



1. All water ultimately comes from \_\_\_\_\_.
2. How many times could the Texas river system circle the earth? \_\_\_\_\_
3. What Texas river begins as the runoff from melted snow in Colorado?  
\_\_\_\_\_
4. What is the shortest river in Texas? \_\_\_\_\_
5. What is one characteristic of an aquifer? \_\_\_\_\_
6. What serves as a convenient divider for describing the distribution of water use in Texas? \_\_\_\_\_
7. What is the tallest waterfall in Texas? \_\_\_\_\_
8. Areas where the ground has collapsed are common in the Trans-Pecos region. What are these areas called? \_\_\_\_\_
9. Where is the greatest concentration of desalinating plants in Texas?  
\_\_\_\_\_
10. What is the only city in Texas to have combined its storm and sanitary sewers into one system? \_\_\_\_\_
11. What is the largest salt marsh in Texas? \_\_\_\_\_
12. What is the cornerstone of good water management? \_\_\_\_\_

# Snow



1. The never-ending exchange of water from the atmosphere to the oceans and back to the atmosphere again is known as the \_\_\_\_\_.
2. How many gallons of water are in an acre-foot of water? \_\_\_\_\_
3. What is the longest river in Texas? \_\_\_\_\_
4. Which river that forms the boundary between Texas and Louisiana discharges more water into the Gulf of Mexico than any other river along the Texas Gulf Coast? \_\_\_\_\_
5. During the 1960's, how did the Bureau of Reclamation inspect concrete pipes? \_\_\_\_\_
6. Name one source of contamination to some aquifers in Texas. \_\_\_\_\_
7. Who made the first record of a drought in Texas? \_\_\_\_\_
8. What happened to Comanche Springs in 1961? \_\_\_\_\_
9. What is the only major city in the United States that obtains its entire water supply from a single aquifer? \_\_\_\_\_
10. What is the largest natural lake in Texas? \_\_\_\_\_
11. What is the deepest Texas port? \_\_\_\_\_
12. Where is the only hypersaline marine lagoon of the United States?  
\_\_\_\_\_

# Sleet



1. How many serious droughts has Texas had during each decade of the 20th century? \_\_\_\_\_
2. Most of the runoff experienced by Texas flows into which body of water?  
\_\_\_\_\_
3. What river forms the boundary between Texas and Oklahoma? \_\_\_\_\_
4. What is the longest river located completely within the state? \_\_\_\_\_
5. Is surface or ground water the primary source of water in Texas? \_\_\_\_\_
6. Name one use of municipal water. \_\_\_\_\_
7. Which area of Texas has no major reservoir? \_\_\_\_\_
8. Which Texas river has the greatest amount of quicksand? \_\_\_\_\_
9. What is the oldest continuously-used irrigation system in the United States? \_\_\_\_\_
10. Which city in Texas has a port that ranks third in the nation? \_\_\_\_\_
11. What is the longest national seashore in the United States? \_\_\_\_\_
12. Why are wetlands important? \_\_\_\_\_

# Hail



# Rain



# Sleet



# Snow



# Answers to Water Questions

## RAIN

1. 8 inches
2. 5,700
3. Red River
4. 6 million
5. windmill
6. lack of federal funds
7. San Solomon
8. shifting course of the Red River
9. Lake Texoma
10. Florida to Brownsville, Texas
11. Aransas National Wildlife Refuge
12. to learn to understand and appreciate the importance of water as it relates to the economy and the environment

## SLEET

1. one
2. Gulf of Mexico
3. Red River
4. Colorado River
5. groundwater
6. (any one) water for households, businesses, restaurants, public offices, sanitation, landscaping, or fire protection
7. Upper Rio Grande and Far West Texas
8. Canadian River
9. Mission San Francisco de la Espada
10. Houston
11. Padre Island National Seashore
12. provides protected habitat for waterfowl and for other animals

## SNOW

1. hydrologic cycle
2. 325,857
3. Rio Grande
4. Sabine
5. rode bicycles through them
6. (any one) introduction of agricultural chemicals, sewage, or industrial and oil-field wastes
7. Cabeza de Vaca
8. went dry
9. San Antonio
10. Caddo Lake
11. Port of Corpus Christi
12. Laguna Madre

## HAIL

1. precipitation
2. 3 times
3. Rio Grande
4. Comal
5. (any one) area, thickness, depth from the land's surface, water quality, or different quantity
6. Interstate Highway 35
7. Capote Falls
8. sinkholes
9. Dallas-Fort Worth
10. Beaumont
11. Sea Rim State Park
12. water conservation