



# EVERY DROP COUNTS!

Colorado is the Centennial State, where majestic mountains, rolling plains, and vibrant cities come together to create a landscape rich in natural wonders. One of the most precious resources that define Colorado's beauty and sustains life is water. From the snow-capped peaks of the Rocky Mountains to the winding rivers and lush valleys below, water plays a vital role in shaping the state's environment, economy, and way of life.

In Colorado, water is not only essential for drinking and recreation but also for agriculture, which is the backbone of our economy. Farmers and ranchers across the state rely on water to grow crops and raise livestock that feed our communities and contribute to the world's food supply. From the vast fields of wheat and corn on the eastern plains to the orchards in the western valleys, water is the lifeblood of Colorado's agricultural industry.

Let us embark on a journey to explore the importance of water in Colorado, learning about its sources, significance, and the crucial role it plays in sustaining agriculture and ensuring food security for our state and beyond. Together, we'll discover the challenges and opportunities of water management in a state where every drop counts, and the ways we can work together to protect and conserve this invaluable resource for generations to come. How do you use water?

In the space below, list ways in which you use water.



Connecting Colorado educators and students to their food, fiber, fuel, and natural resources.

# The Story of Colorado Water

The story of water in Colorado starts in the Rocky Mountains. Colorado is known as a <u>headwaters</u> state. This means that all the precipitation that falls in our state flows OUT of the state, and no water flows INTO the state. There are only two states in the United States that are headwaters states. One is Colorado and the other is Hawaii.

Our state also has many <u>watersheds</u>. Watersheds are sometimes called drainage <u>basins</u>. A watershed is an area of land where rain or snow drains into a stream or other water body. Ridges of higher ground form boundaries between watersheds. Rain falling on one side of the higher ground flows toward the low point of one watershed, while rain falling on the other side of the boundary flows toward the low point of a different watershed.

Snow that falls high in the mountains can sometimes stay frozen for a long time. Nature provides this good way to store our water. When that snow melts, the water then flows downhill towards the rivers and streams.

Colorado has eight major river basins throughout the state. These basins form areas that provide geographical borders for the rivers. The basins are named after the major rivers in each geographical area: Arkansas, Colorado, Gunnison, North Platte,

#### Snake diagram showing how water flows in Colorado rivers.



Rio Grande, San Juan and Dolores, South Platte, Yampa and White. A ninth basin is named Denver and is a boundary or "carve out" for the Denver metro area because of its population size and substantial water needs.

Water from our state flows to 18 other states and Mexico. It is important to leave water in the rivers for people in other states to use. In fact, Colorado is part of agreements that require us to make sure around 2/3 of the water that flows in our rivers crosses state lines to reach downstream states. Downstream refers to the direction that a river, stream, or any flowing water moves towards. It's the way the water flows from higher areas, like mountains or hills, down to lower areas, like valleys or plains. So, if you imagine yourself standing at one spot in a river and looking ahead, downstream would be the direction the water is flowing, away from you.

The diagram on this page is called the snake diagram. It shows how water flows in Colorado rivers. Each dark blue arrow on the diagram represents a major river. Wider blue arrows means more water flows through that river per year. The volume of large-scale water resources is measured in units called <u>acre-feet</u>.

The water flows downhill from the Colorado Rockies to other states, flowing towards both the Pacific and Atlantic Oceans. The dividing point is the Continental Divide, which is the black line separating the blue and green regions on the diagram. The green colored regions flow east toward the Gulf of Mexico in the Atlantic Ocean. The blue colored regions flow west toward the Gulf of California in the Pacific Ocean.

More <u>precipitation</u> falls in western Colorado. The amount of water flowing west is almost eight times the water flowing east. This is because more rain and snow falls on the western half of the state.

There are groups of people in each river basin who develop long-term solutions to water needs. These groups are called <u>Basin Roundtables</u>. These people work together to solve the water challenges we face.

Big winter storms are key for Colorado's water. If big storms miss us, especially over eastern and southern Colorado, drought can follow. Changes to Colorado's snowpack has BIG consequences. More or less snow means more or less water for Colorado and the 18 other downstream states.



Imagine you have a big field that's as long and wide as a football field. Now, picture pouring water on that field until it covers the whole thing and measures one foot up your leg. That's what is called one acre-foot of water! Acre-feet are often used to measure water in reservoirs, lakes, and rivers. This measurement help scientists, engineers, and farmers understand how much water is available for different purposes. Did you know? The Hoover Dam, one of the largest dams in the United States, can hold over 28 million acre-feet of water!

1. One acre of land is 160 feet wide by 272 feet long. Calculate the area:

2. The size of the playing surface of a football field is 160 feet wide by 300 feet long. What is the area of the playing surface? What is the difference between the area of the playing surface and the area of a football field?

3. How many gallons are in 3 acre-feet of water?

#### Water Geography

Can you name the 19 states, including Colorado, that get water from rivers that start in Colorado? And can you name the two countries that use water from Colorado's rivers?

Arkansas

l	13
2	14
3	15
4	16
5	17
6	18
7	19
8	Cour
9	Cour



### Supply-Demand Imbalance

Did you know? Nearly 80% of Colorado's precipitation falls on the Western Slope. More than 85% of Colorado's population and irrigation water demands are on the East Slope. This is called a geographic water supply-demand imbalance.



One-third of an acre-foot of water is delivered to an average home every year. Between 40% to 50% of that water is used inside the home for showers, laundry, cooking, cleaning, and other uses. The remaining 50% to 60% is used outdoors for landscapes and watering lawns. A small fraction of water used outside returns to the water cycle eventually. Of the water used inside the house, 95% returns to the water cycle through the treatment system. Rainfall and snowmelt on roofs and

pavement reaches storm sewers which flow directly to streams.



On the map below, complete these steps:

**Step 1:** Write in the names of the 8 major river basins (**Arkansas**, **Colorado**, **Gunnison**, **North Platte**, **Rio Grande**, **San Juan/Dolores**, **South Platte**, **Yampa/White**), plus the **Denver metro area**. **Step 2:** Place a star where you live.

**Step 3:** What is the name of the watershed where you live?

**Step 4:** Draw diagonal lines on the

water toward the Gulf of California.

watersheds with rivers that will carry

**Step 5:** Draw horizontal lines on the watersheds with rivers that carry water to the Gulf of Mexico.

**Step 6:** Draw a compass rose next to the map to indicate North, East, South, and West.



## **Exploring the Colorado Water Plan**

Have you ever heard of the Colorado Water Plan? The Colorado Water Plan is an important strategy that guides how we use and protect our precious water resources. Let's take a fascinating journey into the heart of Colorado's water management system.

#### What is the Colorado Water Plan?

The Colorado Water Plan is like a wise elder, providing guidance and direction for understanding and managing water across our beautiful state. Just like how you rely on advice from someone older to navigate challenges, the Colorado Water Plan helps us make wise decisions about using water.

#### Purpose of the Colorado Water Plan:

The main goal of the Colorado Water Plan is to ensure that we have enough water for everyone in our state now and in the future. Imagine a big puzzle with pieces representing farms, cities, rivers, wildlife, and more. The Colorado Water Plan helps us fit all these pieces together so that everyone gets the water they need.

#### Benefits of the Colorado Water Plan:

1. Protecting Water for People and Nature: The plan helps us make sure that people have enough water for drinking, cooking, and farming, while also keeping rivers and lakes healthy for fish and other animals to live in.

- 2. Saving Water: We learn clever ways to use less water, like fixing leaky pipes and using water-saving gadgets. This helps us save water for times when we really need it, like during dry spells or droughts.
- **3. Supporting Farmers:** Farmers play a big role in growing the food we eat, so the Colorado Water Plan helps them use water in innovative ways for their crops and animals with growing pressure from drought.
- **4. Planning for the Future:** By thinking ahead, we can make sure that Colorado always has enough water, even as our state grows and changes over time.

#### Ways Students and Schools Can Help with the Colorado Water Plan:

- Learn About Saving Water: You can learn ways to save water at school and at home. Turn off the tap when you brush your teeth and tell your family about fixing leaky faucets. Every drop counts!
- Start a School Garden: You can start a garden at school to learn about growing food and using water wisely. You can plant drought-resistant plants. It's fun and helps save water!

- Join Water Clean-Up Events: You can join events to clean up our local rivers and streams. You can learn about keeping our water clean and help protect animals that live in the water.
- Use Water-Saving Tools: You can use tools that help us save water at school, like water-saving toilets and faucets. It's important to use only the water you need so there's enough for everyone.
- Test Water Quality: You can help scientists by testing the water quality in our local rivers and lakes. You can learn about the animals and plants that live in the water and make sure they have clean water to live in.
- Speak Up for Water: You can talk to your friends and families about why saving water is important. You can also write letters to our leaders asking them to make rules to help save water. Every voice makes a difference!

So, explorers, the Colorado Water Plan is like a wise elder, guiding us to protect and manage our water so that everyone - people, plants, and animals - can thrive. By working together and following the plan, we can ensure a bright and watery future for Colorado!



## Irrigation



In Colorado, water is used in many different ways to help people, plants and animals, and industries. About 90% of the water is used for farming, which means growing crops and taking care of animals. Another 7% is used by people who live in municipalities (cities and towns) for homes, yards, businesses, firefighting, and parks. The remaining 3% is used for things like making electricity and manufacturing products. So, most of Colorado's water is used to help grow the food we eat!

Did you know that Colorado has a lot of land dedicated to farming? About 32 million acres of land are used for agriculture, which is almost half of the state's total land area of 66.67 million acres! The most common use of this farmland is for pasture, with 18.8 million acres used for this purpose. After pasture, there are 11.1 million acres used for growing crops, and 1.3 million acres used as woodland.

One way farmers water their crops is called <u>irrigation</u>. Of all of Colorado's land used for agriculture, only about 2.5 million acres, or 7%, is irrigated. There are many ways to irrigate.

One way is to dig little ditches between rows of crops and let the water run between the rows. This is called <u>furrow irrigation</u>.

Another way to irrigate is to <u>flood</u> an area with water. Hay fields and pasture land are often flooded with water at the right times.

A third way to irrigate is to use a "<u>drip</u>" system of hoses buried just under the soil. This is where water comes out of holes in the hose placed next to the plants.

A fourth way to irrigate is <u>surge irrigation</u>. A computerized valve turns on and off the water supply to furrows. This system is designed to allow water to soak into the ground before more is applied.

Yet another way to irrigate is to use a <u>sprinkler</u> system. This is often called <u>center pivot irrigation</u>. In this method, equipment rotates around a pivot and crops are watered with sprinklers. A circular area centered on the pivot is irrigated.



Furrow Irrigation - Water stays in ditches



Flood Irrigation - Water spreads everywhere



**Center Pivot Irrigation - Water is sprayed** 

### How Much Water Does it Take?

Everything we use every day comes from agriculture or natural resources. And it takes water to produce those things. Plants and animals need water to grow. It takes water to extract minerals from mines. Even preparing and cooking the food we eat requires water. Let's explore how much water it takes to produce items we use everyday. Answer the following questions and make your own guesses for how many gallons it takes to produce one pound of each item. Then try stumping your family members and friends with these questions.

1. It takes 109 gallons of water to produce one pound of peaches. How many gallons of water are needed to produce a pound of lemons? Answer Higher, Lower, or About the Same.

2. It takes 193 gallons of water to produce a pound of bread. How many gallons of water are needed to produce a pound of pasta? Answer Higher, Lower, or About the Same.

3. It takes 122 gallons of water to produce a pound of milk. How many gallons of water are needed to produce a pound of boneless beef? Answer Higher, Lower, or About the Same.

4. It takes 26 gallons of water to produce a pound of tomatoes. How many gallons of water are needed to produce a pound of lettuce? Answer Higher, Lower, or About the Same.

Bonus: How many gallons of water are needed to manufacture one car?



### DiscoverWater.org

Water touches every aspect of our lives-the cells in our bodies, the food we eat, the recreational activities that we enjoy, the weather and much more! DiscoverWater.org is a selfdirected educational resource about different water topics—ranging from global to personal perspective which together reflect many of the complex and important roles of water in our lives. DiscoverWater.org is designed for use by children ages 7-12 and for educators and parents of this age group, both in and out of a classroom setting. Although targeted for tweens, learners of all ages enjoy playing games on DiscoverWater.org!



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A. About the Same (77 gallons for 1 pound of lemons); ک. Higher (222 gallons for 1 pound of pasta); ع. Higher (441 gallons per pound of boneless beef); 4. About the Same (28 gallons for 1 pound of lettuce); Bonus: 39,090 gallons of water to 1 car