

Understanding Water

Many people in Utah have been taught that "water" is very complex and difficult to understand. However, "water" in Utah is actually quite simple. For example, did you know that:

- Half of all the water used on farms in Utah returns to the water basin, replenishing groundwater and aquifers,
- Indoor water use is 95% non-consumptive, which means it runs down the drain and returns to the basin via treatment plants, the Jordan River, etc, without being consumed or evaporated.
- The unit commonly used to measure a volume of water is the acre-foot, which is equivalent to 12" of water over 1 acre of area. It is equal to 43,560 cubic feet, or 325,851 gallons, or approximately 1/3 of a million gallons
- Helpful water-related definitions can be found here: <https://waterrights.utah.gov/wrinfo/glossary.asp>

Some important numbers to keep in mind

At its historical average elevation of 4200 feet, The Great Salt Lake covers approximately 1.1 million acres.

- The average depth of the Great Salt Lake is 14 feet, meaning that the lake contains an approximate average of 15 million acre-feet of water at its historical elevation.
- At its current level of 4191 feet, the Great Salt Lake is down by approximately 7.3 million acre-feet of water, meaning it currently contains approximately 7.7 million acre-feet, just over half the volume it contains when it is at its historical average elevation.
- There are approximately 54 million acres in Utah. The average annual precipitation in our state is on average about 13" of precipitation each year.
- 54 million acres receiving an average of 13 inches per year yields an approximate average of 60 million acre-feet of precipitation per year
- Taken together, the residents of all of Utah's 29 Counties and 248 Cities/Towns use approximately 900,000 acre-feet (0.67% of total precipitation), but remember, much of their water goes back into the system and basin.
- All of Utah's 1.1 million acres of irrigated farms use approximately 4 million acre-feet. Approximately half is returned to the water basin (return flow). Approximately 2 million acre-feet are consumed by the plants or evaporated. Farming, including alfalfa, uses approximately 3% of Utah's precipitation
- Less than half of Utah's farming is in the Great Salt Lake basin. This means farming in the basin, including alfalfa, could consume less than 1% of the water in Utah, not the 80% plus as some have claimed. Alfalfa and farming are NOT the enemies of the Great Salt Lake
- The Great Salt Lake evaporates about 5% of Utah's water, or 2.9 million acre-feet of water in an average year
- Utah's 7.6 Billion trees, vegetation, and surface evaporation consume an astonishing 87 - 91% of the precipitation in Utah, or approximately 54 million acre-feet of water.

Buying water shares is NOT the answer

- All of the water in Jordanelle Reservoir equals approximately 340,000 ac-ft. The average cost of a water right from Jordanelle is \$20,000 per acre-foot. At this price, It would take 3.4 - 7 billion dollars to purchase all the water rights in Jordanelle
- All of the water in Deer Creek reservoir equals approximately 100,000 ac-ft. The average price

for a water right from Deer Creek is \$10 to 15 thousand per acre-foot. At this price, It would take as much as 1.5 billion dollars to purchase all the water rights in Deer Creek.

- All of the usable water in Utah Lake equals approximately 302,000 ac-ft. The average price of a water right from Utah Lake is \$3000 per acre-foot. At this price, It would take 1 billion dollars to purchase these water rights.

If you purchased all the water in these three reservoirs combined, you only get 750,000 acre-feet of water. As we learned earlier, we need approximately 7.3 million acre-feet of water to fill the Great Salt Lake to its historical level. Even if we emptied all three of these lakes into the Great Salt Lake, that would cost several billions of dollars, yet only provide 1/10th the water needed to refill the Lake to historical average levels.

But the water in these lakes is not available. It is already owned and is being used by many Utahns including residents and businesses of Provo, Orem, Salt Lake City, and others. We cannot just buy water rights to fill the Great Salt Lake. This many water rights are simply NOT for sale.

Pumping well water is NOT the answer

Pumping well water cannot solve the problem. We will deplete the groundwater sources and the aquifers.

Conservation at home will NOT fill the Great Salt Lake

According to the Utah Division of Water Resources, "Indoor water use only consumes 5 percent of the metered water. The remaining 95 percent runs down the drains and is treated, then is returned back to the natural system."

While 5 percent is consumed by human use, this meager 5 percent might be completely or mostly offset by water purchased by Utah residents and brought into their homes in the form of bottled water, beer, wine, soda, vegetables, ice cream, etc. Most inside water use such as laundry, showers, toilets, etc., goes back into the system.

Flip your Strip, Slow the Flow Save H2O, and golf course water reporting are NOT the answer

According to the Utah Division of Water Resources "With lawn watering and agricultural irrigation, the concept is slightly different. Because of inefficiencies in our sprinkler systems and watering habits, some water runs off or down the street, some water percolates deep in the soil below the level that cannot be used by the landscape plant roots and some water is lost to leaks in the irrigation systems. However, much of the 'wasted' water returns back to the natural system"

So, What can we do?

Reforestation, wise forest management, and "tree trading" ARE the answers

Randy Julander, retired USDA Snow Survey Hydrologist and published author of numerous articles on Utah's water and watersheds, says "Forest management has a critical role in producing stream flow"

"The more straws (trees) you have sucking, the less water you have for stream flow". Julander explained that a watershed is like a bucket with many straws sucking water out of it. The stream flow reflects what is left after all these straws have had their share.

Julander continued "At the turn of the century, forests were much different than they are today" "The forests we have today have way too many trees. Back at the turn of the century, you might have had 10 to 20 trees per acre, today you might have 100 to 200 trees per acre".

Referring to the trees in the thinner forests at the turn of the last century, he stated "They were more resilient and more capable of producing water".

Julander indicated that our present forests are not as resilient as they used to be, "Too many trees, wrong kind of trees". Today, he said, "You have all these conifers". "I see conifers as the problem" "We are paying the price for the management system we have in place".

Julander stated that replacing Conifers with Aspens in some parts of our forest could yield a great improvement in stream flows. He said "Aspens on average had 42% more potential for streamflow"

Julander also explained that open meadows are essential for retaining and capturing our snowpack. He said "Go from an open meadow to conifers, and you will lose 40 to 50% of snowpack into the atmosphere"

But, we don't have to cut all the conifers to get a significant benefit. Julander continued "You don't have to treat the whole forest", "You have to treat the water-producing areas"

"Cut circular patterns in the conifer forests, you will increase, in that open area right there, the snowpack that you lost (to evaporation off the conifer branches), that 40%, and pick up another 10 to 20% above that".

So, there is hope. We know what to do, and what to expect if we do it. Now is the time to act

"Chain saw Caucus"

Despite what you may have read recently in the newspaper, those who support reforestation and tree trading are NOT the "chain saw caucus" <https://www.deseret.com/opinion/2023/1/26/23569483/tree-thinning-wont-save-great-salt-lake>.

No one is suggesting we clear-cut our forests and there are no significant logging operations in Utah. There is no "chain saw caucus" in Utah.

What is urgently needed is proper forest management in areas with flowing tributaries and at higher elevations.

Replacing encroaching conifers with aspens has the potential to increase flow to streams by more than 40% per acre

Removing conifers and replacing them with aspens and meadows provides wildfire mitigation, improved wildlife habitat, AND increased stream water flows.

Fun Facts:

- An aspen forest does not burn as readily as a conifer forest.
- The aspen ecosystem is rich in number and species of animals, especially in comparison to associated coniferous forest types.

<https://www.fs.usda.gov/wildflowers/beauty/aspen/ecology.shtml>

- The average tree consumes/evaporates about 100 gallons a day
- On average, Utah households use approximately 130 gallons a day for indoor use, and 124 of those gallons, 95%, per day, return directly down the drain, to the treatment plant, to the Jordan River, and to the Great Salt Lake.
- Based on these numbers, 1 household consumes/evaporates roughly 6 gallons of water per day. The remaining 124 gallons from a house go back into the water system
- Therefore, 1 tree consumes as much water as approximately 16 houses