



# OKLAHOMA

## news

MONTHLY NEWSLETTER OF THE OKLAHOMA  
WATER RESOURCES BOARD

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## Here's Half a Hundred Water Facts You Can Learn Today

In search for life elsewhere in the universe, scientists have designed an experiment that serves as a fundamental starting point in their quest. Using sophisticated technology, devices have been constructed and programmed to detect and record temperatures in the range of 32 to 212 degrees Fahrenheit, the span over which water exists in a liquid state. Life as we know it, scientists realize, absolutely requires liquid water.

While scientists focus on water, the rest of us virtually ignore it. Covering as it does more than two-thirds of the world's surface, water is ubiquitous. Yet despite the fact that it seems omnipresent and is an essential, intimate factor in our lives, we know very little about it.

Collected from a wide variety of sources, what follows is a primer on water. It's hoped that the array of facts and figures will serve to heighten the average person's awareness of our world's dependency on water. Consider, then, the following facts:

### THE WORLD'S WATER

-Except for negligible amounts of water newly created or altered by chemical changes, there is the same amount of water on earth now as when the earth was formed.

-If all the water in the world were equally divided between every man, woman and child on the planet, each person would own approximately 98 billion gallons.

-If all the water in the world were poured on the United States, we would be under 90 miles of water. If it were poured into Lake Erie, it would fill it three million times. If it were poured into 35-gallon bathtubs up to the overflow drain, it would fill 10 quintillion, 566 quadrillion, 193 trillion bathtubs.

-About 98 percent of the world's water is unusable to humans, existing in salty oceans or locked up in glaciers and ice caps.

-If melted at a uniform rate, the Antarctic ice cap would enable the Mississippi River to run bank-full for more than 50,000 years.

-At any given time, there are approximately 14 trillion tons of water in the atmosphere in the form of vapor or small droplets. If it all fell at one time, it would amount to only one-inch of rainfall over the entire surface of the earth.

-65 percent of the human race has no piped water. There are many villages in developing countries where the flow from a simple one-inch pipe would bring in as much as 150 people working all day to carry it in.

-Wooden water pipes, usually made of elm, were used for 200 years during the middle ages.

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**10 Gal**

**Less Salt Water = 4 Cups**

**Less Polluted Water = 1 Cup**

**Less Icebergs and Glaciers = 9 Drops**

Just how much water is available for humanity's use? R.K. Johnson, executive director of the National Rural Water Association based in Duncan, recaps the situation like this when he makes a speech.

Johnson mentally condenses all the water in the world so that it will fill a 10-gallon container. He subtracts the salt water, leaving only four cups of the original 10 gallons. Next to go is all the water too polluted for use by animals or humans, leaving just one cup of water. Water unavailable because it is frozen in icebergs and glaciers is subtracted, leaving only nine drops of the original 10 gallons.

"The only thing we can do is to save those nine drops of water that we do have," he says.

Water Facts, continued from page 1

### THE NATION'S WATER

-Forty-two out of fifty states have at one time or another declared drought conditions.

-Some forecasters predict the United States will need one trillion gallons of water a day by the year 2000, up from the 420 billion we use each day presently.

-The average U.S. rainfall is 30 inches a year. About 75 percent of that rain falls on only 35 percent of the land.

-Approximately 4.2 trillion gallons of precipitation fall in the U.S. each day. Seventy percent evaporates before it can be used or stored for future use.

-Ground water aquifers in the U.S. contain about 35 trillion gallons, 20-30 times the amount all our lakes and surface reservoirs combined can hold. It's an amount roughly equivalent to the total discharge of the Mississippi River into the Gulf of Mexico from the signing of the Declaration of Independence in 1776 to the present.

-Eighty-four percent of our nation's water is consumed by 17 western states, largely for irrigated agriculture.

-Three percent of all the energy consumed in the U.S. goes for heating domestic hot water tanks.

-The total potential earth-moving power of all water in the U.S. equals that of five million large bulldozers. Such force could move a mass equal to Mt. McKinley in 10,000 years.

-The average annual damage from floods in the U.S. is about \$1.5 billion. Approximately 56 percent of flooding occurs on upstream tributaries while the rest occurs in downstream valleys.

-Up to 1800 only nine water works were recorded. Today more than 25,000 water works supply the billions of gallons demanded by the U.S. population.

### OKLAHOMA'S WATER

-Oklahoma ranks sixteenth among fifty states with a water area of 1,281 square miles.

-Twelve major ground water basins in Oklahoma contain an estimated 320 million acre-feet of fresh water, half of which is estimated to be recoverable.

-Ground water supplies 61 percent of the total water reported used in Oklahoma.

-The Ogallala Aquifer is the major source of water in the Oklahoma Panhandle with over 2,000 irrigation wells drilled in the area.

-The average person in Oklahoma uses approximately 150 gallons of water a day in and around the home.

-In 1926 there were only four reservoirs in Oklahoma with a combined storage of approximately 125,000 acre-feet. Today we have 47 major lakes with a conservation storage of over 13 million acre-feet.

-From 1931 to 1971, drought occurred somewhere in Oklahoma 51 percent of the time.

-The Arkansas and Cimarron Rivers carry 11,900 tons of salt per day into Keystone Lake near Tulsa.

-Oklahoma City pays \$250,000 a month in electric bills just to pump water from Lake Atoka to the city.

### WATER AS A COMPONENT

-Apples are 85 percent water; beer, 92 percent water; soft drinks, 90 percent water; watermelon, 97 percent water; potatoes, 80 percent water; spinach, 91 percent water; whole milk, 87 percent water; hot dogs, 56 percent water; and peanut butter, 2 percent water.

-It takes 375 gallons of water to obtain one pound of flour, and 136 gallons to produce a loaf of bread.

-A single ear of corn requires 25 gallons of water to develop. An acre of corn releases 3,000 to 4,000 gallons of water a day into the air through transpiration.

-Canning a case of sweet cherries requires 90 to 180 gallons of water.

-To produce one ton of refined sugar requires 4,000 gallons of water.

-It takes 2,300 gallons of water to grow and transport the pound of beef that makes four hamburgers.

-Blood is 83 percent water, and brains are 75 percent water.

-Processing one copy of a large Sunday newspaper takes about 280 gallons.

-Each gallon of gasoline takes seven to ten gallons of water to produce, while each gallon of alcohol requires 235 gallons of water.

-95,000 gallons of water are needed to manufacture a car. The 30,000 pounds of aluminum required for a bomber drinks up 29 million gallons of water.

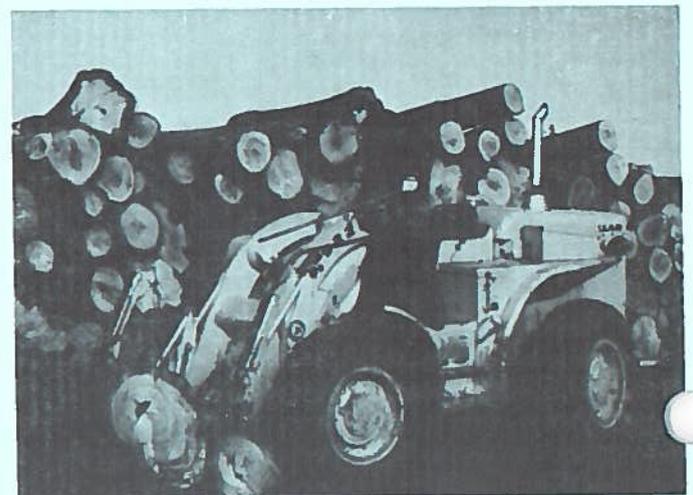
-A ton of rayon requires 200,000 gallons of water to produce; a ton of synthetic rubber, 600,000 gallons; a ton of cotton cloth, 13,000 gallons; and a ton of steel, 60,000 gallons.

-By drinking water at a rate of two pints a day, an individual consumes nearly 100 gallons a year. In so doing we ingest as much as three ounces of dissolved lime.

### WATER IN GENERAL

-Clouds release only five to 15 percent of their moisture when it rains.

-Between 90 and 95 percent of the water that falls on the land escapes our direct use.



As wood comes from the forest, each freshly cut log contains 35 to 40 percent water.

-The amount of water in the atmosphere above a square mile of land on a mild summer day is on the order of 50,000 tons.

-If we add water for recreation, food production and energy, each person uses about 1,500 gallons a day.

-Some people have been known to drink so much water that they've died. The condition is called psychogenic polydipsia, or compulsive water drinking.

-Air would not be fit to breathe if there were no water in it.

-Water moves through aquifers a few inches to several feet a day.

-Scotch whiskey cannot be imitated because only in Scotland can be found the spring water that rises through a red granite formation before passing through moss country.

-Unless hemmed in by human hand, all streams will flow in curves. Natural channels are seldom straight for a distance of more than 10 channel widths. Thus a stream 100 feet wide will have straight stretches no longer than about 1,000 feet.

-Leakage accounts for five to 10 percent of all residential water consumption.

-A study conducted in Arizona, Colorado and Wyoming concluded that homeowners watered their lawns 2,769 gallons per day per acre more than necessary.

## Southeast Water Use Permits Scheduled for Spring Review

Stream water permits in nine of Oklahoma's 49 stream systems are undergoing review for compliance as part of a continuing OWRB program designed to return unused water to the public, Executive Director James R. Barnett says.

Launched in 1976, the program set up a rotation of stream systems wherein the allocation and actual usage for every stream water permit in the state is studied to determine if the water was put to beneficial use as required by Oklahoma Stream Water Law. If a permit holder fails to use his full allocation at least once in any continuous 7-year period, or if he fails to use amounts of water in accordance with the schedule of use approved by the Board, he receives a notice from the OWRB indicating intent to reduce the amount of water authorized annually or cancel the permit as Oklahoma Statutes require.

Thirty-two permit holders in stream systems 1-1 (main stem from the Arkansas State Line to the mouth of the Kiamichi River) and 1-2 (Little River areas) received notices in early March advising them of hearings to either administratively cancel or reduce their permits, says J.A. Wood, Stream Water Division chief. At such hearings they may appear and present evidence to refute staff findings they believe objectionable. In the same mailing was a form which permit holders may sign and return, indicating a voluntary consent to the reduc-

### ACTIVE CONSERVATION STORAGE IN SELECTED OKLAHOMA LAKES AND RESERVOIRS AS OF FEBRUARY 15, 1983

PLANNING REGION LAKE/RESERVOIR	CONSERVATION STORAGE (AF)	PERCENT OF CAPACITY
<b>SOUTHEAST</b>		
Atoka	102,300	82.5
Broken Bow	904,500	98.5
Pine Creek	54,367	69.9
Hugo	157,600	100.0
<b>CENTRAL</b>		
Thunderbird	106,000	100.0
Hefner	59,000	78.3
Overholser	13,600	85.6
Draper	79,200	79.2
<b>SOUTH CENTRAL</b>		
Arbuckle	62,571	100.0
Texoma	2,504,700	94.9
Waurika	195,700	96.3
<b>SOUTHWEST</b>		
Altus	79,200	59.6
Fort Cobb	73,100	93.2
Foss	147,900	60.6 <sup>2</sup>
Tom Steed	74,700	83.9
<b>EAST CENTRAL</b>		
Eufaula	2,329,700	100.0
Tenkiller	627,500	100.0
Wister	26,744	98.7
<b>NORTHEAST</b>		
Eucha	80,000	100.0
Grand	1,423,700	95.4
Oologah	544,240	100.0
Hulah	30,000	98.0
Fort Gibson	365,200	100.0
Heyburn	6,600	100.0
Birch	19,167	99.8
Hudson	200,300	100.0
Spavinaw	30,600	100.0
<b>NORTH CENTRAL</b>		
Kaw	396,640	92.5
Keystone	616,000	100.0
<b>NORTHWEST</b>		
Canton	94,600	97.0
Optima	3,956	--- <sup>1</sup>
Fort Supply	13,900	100.0
Great Salt Plains	31,400	100.0
<b>STATE TOTALS</b>	<b>11,454,685<sup>3</sup></b>	<b>95.5<sup>3</sup></b>

1. In initial filling stage
2. Temporarily lowered for maintenance
3. Conservation storage for Lake Optima not included in state total

Data courtesy of U.S. Army Corps of Engineers, Bureau of Reclamation, Oklahoma City Water Resources Department, and City of Tulsa Water Superintendent's Office.

tion or cancellation if they agree with the records of water use on file. A third item was a summary of water use as reported each year by the permit holder. If that summary is at odds with the permit holder's personal record of water use, permit holders may simply correct the form, sign it, have it notarized and return it to the OWRB prior to or on the hearing date for Board con-

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*Water Use Permits* | continued from page 3

sideration. When the hearing is completed, the hearing officer's recommendation is presented to the 9-member Board which either validates the permit for the full amount, reduces the permitted amount or cancels the permit.

The sequence of events required by law and alternatives available to permit holders are the same each time the OWRB reviews permits in any stream system, Wood emphasizes.

In May and June, the Board plans to hold reduction and cancellation hearings in southwestern Oklahoma for stream system 1-12 (Beaver Creek), stream system 1-13-1 (the Red River and Cache Creek between the mouths of Beaver and Cache Creeks) and stream system 1-13-2 (the Deep Run and West Cache Creek to the confluence with Cache Creek).

The studies will then move eastward across the bottom of the state in the late summer and fall of 1983 including in order stream system 1-4 (the Muddy Boggy River), stream system 1-5 (the main stem of the Red River from the mouth of the Muddy Boggy to the mouth of the Blue River), stream system 1-6 (the Blue River), stream system 1-7 (the main stem of the Red River from the mouth of the Blue River to the mouth of the Washita River) and stream system 1-9 (the main stem of the Red River from the mouth of the Washita River to the mouth of the Walnut Bayou).

Last year the Stream Water staff reviewed almost 700 permits, freeing up more than 218,000 acre-feet of water for reappropriation by the Board. That amount of water is greater than the amount of water stored in Oklahoma City's Hefner, Draper and Overholser Lakes combined.

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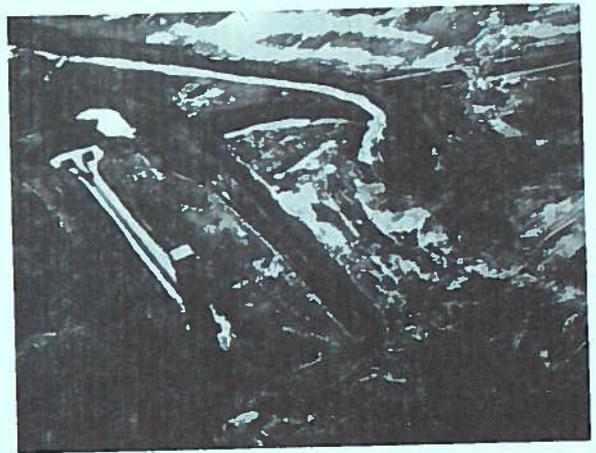
## OKLAHOMA WATER NEWS

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### ORWA Annual Meeting Convenes March 29-30

The Oklahoma Rural Water Association's 13th annual meeting will be held at the Holiday Inn West in Oklahoma City, according to Gene Whatley, ORWA executive director. Congressman Wes Watkins will deliver the keynote address at the convention banquet on March 29. Other speakers include R.K. Johnson, National Rural Water Association president; Dwight Calhoun, Farmers Home Administration, Washington, D.C.; Sen. Ray Giles; Mac Weaver, EPA, Dallas; and James R. Barnett, executive director, OWRB.



Outlet tower and conduit (lower left) and diversion dike beyond mark the site of the dam which will be built on the Deep Fork of the North Canadian River to impound Lake Arcadia near Edmond.

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