

Oklahoma

Water News

MONTHLY NEWSLETTER OF THE OKLAHOMA WATER RESOURCES BOARD

OWRB Readies First 10-Year Yield Update on Tillman Terrace

With passage of the Oklahoma Groundwater Act in 1972, the Water Board assumed a new level of responsibility for Oklahoma's water resources. One important aspect of the law mandated that the OWRB conduct hydrologic surveys of each of the state's 21 major groundwater basins (and their sub-basins). These surveys are vital in assessing the maximum annual yield of state aquifers and properly managing water supplies for future availability and use.

Although the Board constantly monitors water use in Oklahoma, updates of aquifer conditions are sometimes necessary to supplement data gathered through yearly water use reports. The Oklahoma Groundwater law also addressed this need to assess long-term trends in aquifer performance by requiring the Board to update hydrologic investigations every 10 years. In September, the OWRB's Groundwater Division will begin its first such review of a state groundwater basin, the Tillman terrace deposits (of the North Fork of the Red River) in southwest Oklahoma.

The maximum annual yield of the Tillman terrace was initially determined in 1978, when the aquifer—one of the 10 major alluvium and terrace deposits in the state—was heavily influenced by sharp increases

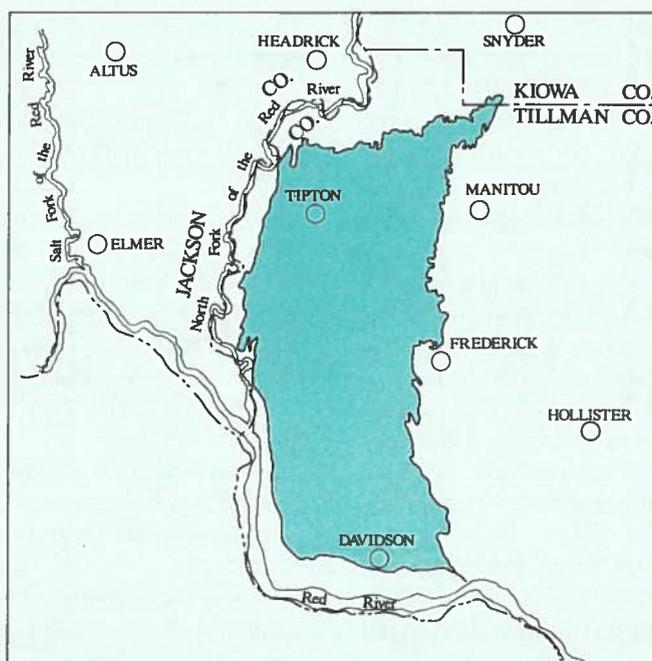
in irrigation use. Between 1953 and 1973, irrigation withdrawals from the Tillman terrace deposits increased fourfold. Water levels declined five to 15 feet in many areas and, because the aquifer relies so heavily on that region's scant precipitation, withdrawals soon exceeded recharge.

Terrace deposits are prolific sources of water, especially in west-

ern Oklahoma. Generally, they represent older, higher stages of meandering rivers which have since cut deeper channels, leaving behind deposits of sand, gravel and other materials carried by the river's current. They differ from alluvium deposits in that they are older and sit higher in the floodplain. Today's alluvium is tomorrow's terrace.

Geologically, the Tillman terrace consists of remnants of both the North Fork of the Red River and the Red River itself. But, according to OWRB geologist Bob Fabian, who is coor-

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The Tillman terrace deposits underlie much of western Tillman County in southwest Oklahoma. The aquifer consists of ancient deposits laid down by the North Fork of the Red River and the Red River, which today forms the Oklahoma-Texas border.

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minating the study with the Lawton branch, the formation is actually considered a sub-basin of the North Fork terrace deposits.

"For convenience of study, we have divided many of Oklahoma's major basins into two or more sub-basins. The Tillman terrace deposits are only one of two sub-basins making up the terrace deposits of the North Fork of the Red River. As a result, separate updates will be conducted on each," he pointed out.

The sand and gravel deposits of the Tillman terrace yield substantial amounts of municipal water for Frederick, Tipton, Davidson and Manitou although irrigation of cotton, peanuts and other crops accounts for roughly 90 percent of the water withdrawn from the aquifer. The sub-basin encompasses an area of 285 square miles. Its thickness varies due to the irregular bedrock surface on which the sediments have been deposited.

Fabian said that the Tillman study will make use of water level data collected from three wells equipped with continuous recorders and 20 wells which are a part of the Board's annual well measurement network. In addition, flow measurements will be taken on the North Fork and its tributary, Otter Creek.

From study results, Board researchers will again calculate the maximum annual yield of the Tillman terrace deposits. That determination will be based on the total land area overlying the basin, amount of water in storage, rate of natural recharge, transmissibility of the basin, and possibility of pollution to the aquifer from natural sources. If the maximum annual yield differs from that concluded by the 1978 study (70,000 acre-feet), the OWRB will conduct a hearing to solicit comments from farmers, ranchers, municipalities and others in the region who depend on the aquifer.

Fabian expects results to show that the groundwater basin is not presently threatened by depletion. Other data will help researchers predict future water-use trends.

"We'll also conduct modeling of the aquifer to simulate long-term effects of water usage," he said.

Stafford Act Changes Flood Assistance

Federal legislation passed in May has substantially altered the existing structure of federal disaster assistance programs, including financial relief sought by city and county governments to deal with nature's most frequent disaster—flooding.

The Robert T. Stafford Disaster Relief and Emergency Assistance Act requires that the amount of federal public assistance funds for repair of flood-damaged property be reduced by the amount of flood insurance proceeds that would have been received for publicly owned and private, nonprofit buildings in special flood hazard areas, whether or not they are insured. According to Ken Morris of the OWRB's Engineering Division, the new law will encourage many municipal and county governments to enroll in the National Flood Insurance Program.

"Previously, full federal assistance was available to almost any uninsured public structure damaged by floodwaters. Now these funds are restricted somewhat," he said. "The Stafford Act should prompt uninsured communities who anticipate flooding and depend upon federal disaster assistance to mitigate flood damage to seriously consider participating in the NFIP," he said. The OWRB coordinates the NFIP in Oklahoma.

The NFIP was created in 1968 to provide an affordable insurance mechanism for financial protection against flooding in communities willing to identify flood hazard areas and adopt and enforce floodplain management ordinances designed to reduce flood losses. Flood insurance is not available for property owners in communities not enrolled in the NFIP.

When the President determines that a flood or other natural disaster has caused such damage that response cannot be adequately delivered by state and local governments, he may, upon a formal request by the governor of the affected state, declare the event a major disaster. Such declarations trigger a number of federal responses, including assistance to indi-

viduals and families in the form of loans, grants and temporary housing and for the repair of publicly owned facilities. Normally, federal disaster relief funds cover only uninsured losses.

"The new legislation will have the greatest effect on city halls, libraries, schools, police and fire stations and other community owned structures," Morris said. Maximum coverage available under the NFIP for these buildings and their contents is \$200,000 each.

"For example, if flood damage to an uninsured city hall (in a designated special flood hazard area) totals \$500,000, the amount of federal funds available for repair is normally reduced by \$200,000—the maximum amount of flood insurance available. Standard 75/25 percent cost-sharing between the federal government and the affected state or community is applied to the remaining \$300,000 in damages," he explained.

Communities participating in the NFIP are furnished with maps which delineate special flood hazard areas, or areas where development should be controlled. Buildings which already exist in these restricted zones should be insured for their values or the maximum coverage available. Policies may be written by any licensed property/casualty insurance agent or broker.

In the 1960s, there were approximately 5,000 communities in the U.S. with identified special flood hazard areas. Today, some 18,000 communities participate in the NFIP; another 2,000 have identified flood hazard areas, but have not yet joined the NFIP. In addition, more than two million flood insurance policies are now in force in the U.S.; all but one percent are for residential structures.

"When deciding which municipal buildings to insure, communities should take into account that between one-fourth and one-third of all claims paid by the NFIP have been for losses that occurred outside special flood hazard areas, identified as having only minimal to moderate flood

risk," Morris pointed out. "We recommend that communities consider insuring more than just buildings located in flood hazard areas."



Cores Monitor Temp Changes

Scientists from a dozen universities and research labs are taking core samples from the Greenland Ice Sheet in an attempt to monitor global warming trends over the past thousands of years. In the five-year effort sponsored by the National Science Foundation, scientists will drill 10,000 feet into the ice sheet to gather information on global warming from a "greenhouse effect."

According to "U.S. Water News," (July 1989) samples will be compared to Antarctic deep-drilling programs, as well as deep sea sediment, lake sediment and glacial geologic sediment to gauge global changes between hemispheres. Researchers believe air locked in the polar ice sheets provides a reliable record for studying changes in the world's atmosphere. Snow falls on the permanent ice, is compacted into ice granules by the pressure of later snows, moves downward and outward and becomes increasingly dense. Between the ice grains are voids, sealed to become samplings of the earth's past air.

From this data, scientists expect to test and refine models which can predict the effects of impending greenhouse warming. Immediate emphasis will be on atmospheric carbon dioxide recorded before 1958. They will concentrate on the last cold period—the Little Ice Age from 1550 A.D. to 1850 A.D.—and the last warm period—the Medieval Warm Period around 1200 A.D. The research will cover the entire 11,000 years of the Holocene period and provide information on the relationship of climate and human history.

Norman, MWC Honored

Two Oklahoma communities and one state industry will receive 1989

Environmental Excellence Awards from U.S. Environmental Protection Agency Region VI. According to EPA Regional Administrator Robert E. Layton, Jr., the awards were created to recognize environmental excellence by industries, communities and businesses in Arkansas, Louisiana, New Mexico, Texas and Oklahoma.

"We cite polluters for violating environmental laws," Layton said, "so I am particularly pleased to recognize industries, communities and businesses for their environment stewardship." Layton has already presented the awards to winners in four states; Oklahoma's awards ceremony will be held August 17 at the State Capitol.

The Cities of Midwest City and Norman will receive recognition for outstanding industrial wastewater control. Halliburton Services Manufacturing Center, of Duncan, will be presented a separate award for exemplifying safe hazardous waste management. In addition, special recognition will go to the Oklahoma Water Utilities Training Center at Rose State College for excellence in training.

EPA awards are extended to those who excel in compliance, maintenance and management of waste treatment facilities. According to Layton, drinking water suppliers are recognized for consistent compliance with drinking water regulations and outstanding operation and maintenance; wastewater discharge permit holders are recognized for excellence in compliance; and hazardous waste awards are presented to companies that exemplify environmentally safe management of hazardous waste.

Watch Summer Water Use

Lawn and landscape watering is the major outdoor water use for residences and commercial buildings. Repair leaky outdoor faucets and replace damaged washers which waste water. Cover hot tubs and pools to reduce evaporation and use filter backwash to water the lawn rather than letting it run down the drain. And when washing a car or boat, consider parking it on the lawn so that grass may benefit from the runoff.

Use a spray gun or nozzle on the hose's end to control water use. But use a broom—not a hose—to clean driveways, patios or sidewalks. In addition, consider collecting rainfall from the roof of the house in a tank or cistern for later use outdoors.

Salt Lake Pumping Finished

The successful \$60 million pumping project in the Utah desert to prevent further flooding from the Great Salt Lake is over.

For almost two years, beginning in the spring of 1987, three enormous pumps sent one million gallons of water per minute to a 500-square-mile evaporation pond in the desert west of the Great Salt Lake.

The pumping project, hailed by many as a "miracle of engineering," was rushed to completion in just nine months. It was successful in lowering the surface level of the Great Salt Lake from 12 feet above normal in 1986 to 6.5 feet above normal in May of this year. The pumping effort was aided by two successive dry years.

The decision to mothball the pumps on July 1 was made by the Utah Legislature.

Bureau Appoints Patterson

Roger K. Patterson of Billings, Montana, has been named regional director of the Bureau of Reclamation's nine-state Great Plains Region, said Acting Commissioner of Reclamation Joe Hall in late July.

Patterson, a 20-year BR veteran, will supervise 1,000 employees in the Billings office, nine project offices and two construction offices.

Brown New Project Manager

A recent reorganization of U.S. Army Corps of Engineers headquarters in Washington, D.C., resulted in the naming of Bob Brown of the Corps' Tulsa office as District Project Manager. The reorganization upgrades the project manager program adopted in 1988 and enlarges it to a new Project Management Division under Dr. Bory Steinberg, longtime

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Corps civilian official.

According to Corps Chief Lt. Gen. Henry J. Hatch, the program provides for a civilian engineer working for the Corps to manage a project throughout its entire life cycle, including plan-

ning, design, construction and operation. He said he expects that approach to pare construction time on Corps water projects from 15-20 years now required to seven years in the future.

Corps officials point out that the

program has two other assets. It should improve cost estimates and make the Corps more conscious of cost overruns, particularly now that local sponsors must pick up more of the costs of Corps projects under the 1986 cost-sharing authorization law.

**ACTIVE CONSERVATION STORAGE IN SELECTED OKLAHOMA LAKES AND RESERVOIRS
AS OF JULY 27, 1989**

PLANNING REGION LAKE/RESERVOIR	CONSERVATION STORAGE (AF)	PERCENT OF CAPACITY	PLANNING REGION LAKE/RESERVOIR	CONSERVATION STORAGE (AF)	PERCENT OF CAPACITY
SOUTHEAST			Wister	63,250	100.0 ²
Atoka	122,312	98.6	Sardis	302,500	100.0
Broken Bow	918,100	100.0	NORTHEAST		
Pine Creek	77,421	99.6 ²	Eucha	79,567	100.0
Hugo	157,302	99.8 ²	Grand	1,433,650	96.1
McGee Creek	109,800	100.0	Oologah	544,240	100.0
CENTRAL			Hulah	30,594	100.0
Thunderbird	105,925	100.0	Fort Gibson	365,200	100.0
Hefner	72,294	95.8	Heyburn	6,504	98.6
Overholser	15,935	100.0	Birch	19,200	100.0
Draper	84,595	84.6	Hudson	200,300	100.0
Arcadia	27,390	100.0	Spavinaw	29,000	96.7
SOUTH CENTRAL			Copan	43,400	100.0
Arbuckle	62,571	100.0	Skiatook	317,060	99.3
Texoma	2,637,700	100.0	NORTH CENTRAL		
Waurika	203,100	100.0	Kaw	427,766	99.8 ²
SOUTHWEST			Keystone	616,000	100.0
Altus	112,090	84.4	NORTHWEST		
Fort Cobb	78,423	100.0	Canton	97,500	100.0
Foss	182,069	74.7 ¹	Fort Supply	13,748	98.8
Tom Steed	84,176	94.6	Great Salt Plains	31,400	100.0
EAST CENTRAL			STATE TOTALS	12,629,282	99.7
Eufaula	2,329,700	100.0			
Tenkiller	627,500	100.0			

- 1. Conservation storage lowered for project modification
- 2. Seasonal pool operation

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.

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