



**US Army Corps
of Engineers.**
Tulsa District

How Corps Lakes are Managed





Introduction

It's sunrise. You're standing on the shoreline of a Tulsa District, Corps of Engineers lake. Maybe you're a fisherman angling for an early catch or a nature enthusiast watching for wildlife. You like the quiet natural setting provided by the lake, but you know that as the day passes so passes the quiet. The swimming, boating, and skiing activities take over, and many visitors arrive to enjoy the day.

The Tulsa District welcomes everyone to enjoy the natural environment created and protected at our lakes.

We are committed to provide the best service possible from the projects we construct and manage. Behind the scenes, our employees work to keep the lakes safely providing the services authorized.

Many of our projects provide electricity for homes and businesses; many store water used as water supply for nearby communities and industries. Our lakes are built to capture rain runoff to control downstream flooding. These purposes and many others give tremendous benefits to the American economy—both nationally and locally — and the Corps of Engineers works with local communities to ensure the benefits are maximized.

This booklet is designed to help introduce the multiple purposes of Corps of Engineers lakes and how they are operated to maximize those multiple benefits for all Americans.

**Tulsa District manages
32 flood control lakes:
8 in Kansas,
23 in Oklahoma, and
1 in Texas.**

**We also manage flood
control operations at 12
reservoirs owned by city,
state or other federal
agencies.**

Project Purposes

A lake is a great place to have fun, but fun was not why Congress authorized a dam to be constructed. Fun may be the purpose for a family trip to the lake, but that pool of water is serious business. Within that pool of water are the various purposes and benefits of the lake—the reasons for its existence.

The purpose of each lake is determined by Congress, and each lake has been authorized in public law. For example, Eufaula Lake was authorized in the River and Harbor Act of July 24, 1946. The original authorized purposes are flood control, water supply, hydroelectric power, and navigation.

Once approved by Congress, studies and construction plans were completed and, when funded, construction began.

Original Project Purposes (Year Authorized)	Flood Control	Water Supply	Hydropower	Navigation	Recreation	Water Quality	Fish and Wildlife	Regulation of Flows
Lake Texoma Texas & Okla. (1938)	X	X	X	X	X			X
Eufaula Lake Okla. (1946)	X	X	X	X	See Note			
Skiatook Lake Okla. (1962)	X	X			X	X	X	
Kaw Lake Okla. (1962)	X	X	X		X	X	X	

Note: These project purposes are those specifically listed by Congress in the authorizing legislation. However, the Flood Control Act of 1944 (Public Law 78-534) provides that federal lakes authorized prior to 1965 have recreation as a project purpose regardless of whether recreation was specifically addressed. Therefore, Eufaula Lake has recreation as a project purpose.



A System of Lakes

No matter where you live, there is probably a Corps lake nearby. Nationally, the Corps manages nearly 600 dams and lakes. Tulsa District manages 32 flood control lakes plus the flood control storage at 12 state and other federal agency lakes.

Individually, lakes are integral parts of the community they serve. Flood control lakes protect the towns, cities, and farmland immediately downstream. Collectively, they operate as a system.

Within the Arkansas River basin, lakes in Kansas flow into Oklahoma; and lakes in Oklahoma flow into Arkansas which flow into the Mississippi River. One lake affects another.

When operated together, lakes in a watershed can increase the individual benefits of downstream lakes.

Direct benefits of Corps lakes generally fall into eight categories.

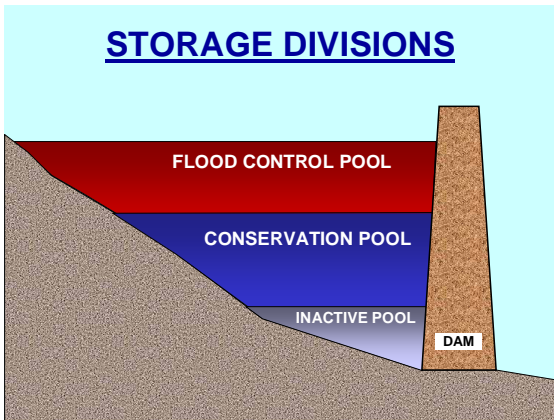
- Flood Control
- Water Supply
- Hydroelectric Power
- Navigation
- Recreation
- Water Quality
- Fish and Wildlife
- Regulation of Flows

Typical Dam Storage Divisions

On the simplest level, lakes hold water. That water can be fished in, skied on, boated upon, waded in, drank, used for irrigation and other purposes. But that water is not one, single pool.

A typical lake in the Tulsa District has three storage divisions: inactive pool, conservation pool, and flood control pool. Each storage division has a top-of-pool elevation. The point between two storage divisions represent a transition point where the operating rules change. For example, when the pool elevation is above the top of the conservation pool the lake has

risen into the flood control pool division, and the operating rules are different than when the pool elevation is within the conservation pool area.



Typical storage divisions of a lake include three areas—inactive pool, conservation pool, and the normally dry flood control pool.

The transition elevation between the conservation pool and flood pool can also vary seasonally and is called a seasonal pool plan. Lake Texoma on the Red River has a seasonal pool plan which enhances the fish and wildlife benefits of the lake. Such plans are

created and managed with state fish and wildlife agencies and other stakeholders.

Flood Control Pool

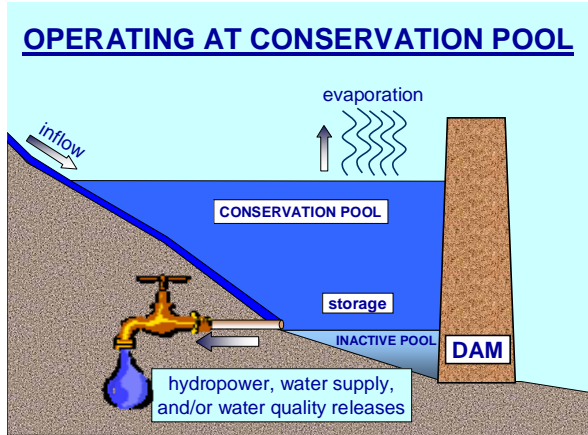
The flood control area behind a dam is normally kept empty. This area is used to catch and control upstream flows which, without the dam, would cause flooding downstream. The amount of storage in the flood control pool is determined when the project is designed and authorized by Congress.

Conservation Pool

The conservation pool contains all the water stored for project purposes. The goal for lake operation, when the lake's level is in the conservation pool, is to only allow releases or withdrawals to users who have water permits from the state and have assigned storage within the conservation pool. Examples of withdrawals from the conservation pool are hydro-power, water supply, water quality, and minimum flow requirements.

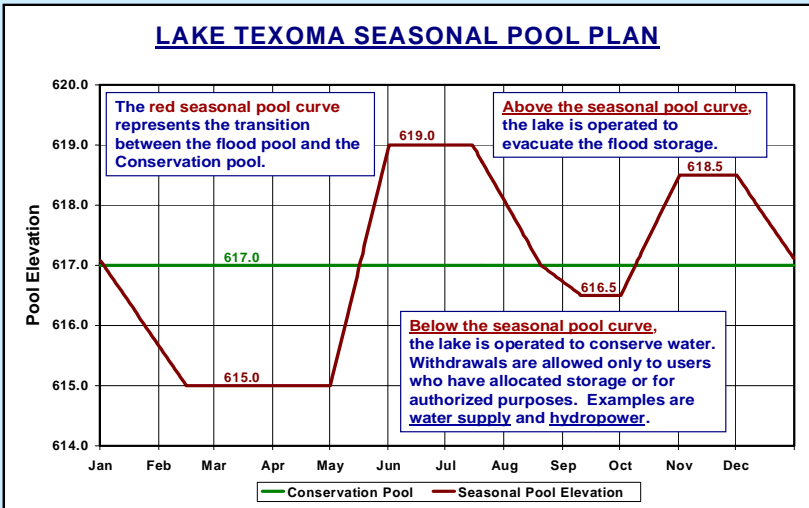
Inactive Pool

The inactive pool is the lowest storage area in the lake. It is the area designed to trap sediment which enters the lake with every rain. Over the life of the project, as sediment is trapped by the dam, the total storage shrinks. Sediment can impact project purposes as storage capacity is reduced.



A typical lake's conservation pool stores all the water needed to meet the authorized purposes. The lake level fluctuates as the water is used and is replaced by inflows.

Water in the inactive pool would only be used during extreme droughts or emergencies and only after the conservation pool has been emptied.



Lake Texoma's seasonal pool plan allows water levels to be fluctuated lower to encourage grain crop growth in the spring and higher to submerge those growths to provide habitat for water fowl breeding and cover for juvenile fish.

Multipurposes Benefit the Region

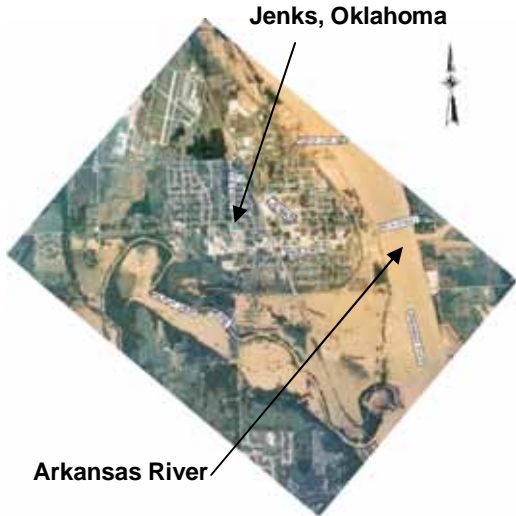
The beauty of a lake with the sparkling cool water lapping at the tree-lined shore does not provide the casual observer an appreciation of the lake's benefit.

Manmade lakes exist to fulfill specific purposes envisioned by the designers and invested in by Congress for the American people. All Americans have a stake in the federal government's management of the project and the effect it has on the environment and economic health of the area.

Flood Control

It is not obvious, but lakes are powerful tools which prevent repeated economic and human hardships and death. Flood control is the first, and most significant, benefit our lakes provide. Water is an incredibly powerful, destructive force. Controlling it has blessed many communities with comfortable nights' sleep while storms have threatened.

In the Tulsa District, nearly \$5 billion in flood damages have been prevented by our lakes, and countless lives have been preserved because our lakes stopped the flood flows.



Flood water (brown areas) of the Arkansas River flows past Jenks, Okla., during the flood of 1986. Levees around the city kept local damages to a minimum. Keystone Lake, upstream 25 miles, prevented a catastrophe by preventing uncontrolled runoff of nearly 425,000 cubic feet per second.

Storage Versus Purpose

Corps lakes have authorized purposes, but being authorized as a purpose does not necessarily mean that water is stored by the dam for that purpose.

For example, Keystone Lake in Oklahoma has navigation as a project purpose, but it does not store water for navigation. However, the lake has a hydropower purpose and water is stored to meet that purpose. In this case, the hydropower pool fulfills the navigation purpose when water is released through the generators.



Navigation

One of Tulsa District's first missions was to identify opportunities to enhance the nation's navigation system. As a result, many of our lakes have navigation as a project purpose. The navigation system on the Arkansas River, the McClellan-Kerr Arkansas River Navigation System, was completed in 1970. The channel travels 440 miles from near Tulsa, Okla., to the Mississippi River. There are 18 locks and dams on the McClellan-Kerr system—five of which are in Oklahoma. Some 13 million tons of cargo such as steel, rock, fertilizer, and wheat are transported on the Oklahoma portion of the system each year.

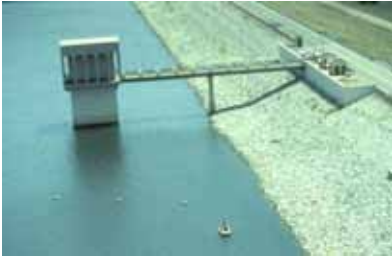
Hydroelectric Power

Eight of the district's lakes have hydropower units which are reliable and efficient sources of energy. The Corps of Engineers is the largest operator of hydroelectric power plants in the United States and one of the largest in the world. Nationally, our 75 hydropower projects provide 100 billion kilowatt-hours of energy. That is enough energy to serve more than 10 million households.

In the Tulsa District, benefits from the sale of hydropower by the Southwestern Power Administration generally exceed \$100 million per year. The electricity lights thousands of homes and the money received goes directly to the United States Treasury.

Hydropower plants contribute to cleaner air because they do not burn fossil fuels like coal and oil. And they are good for the economy because they provide an inexpensive source of power which helps keep energy prices down. The Corps hydropower plants have low operating costs and are immune to rising fossil fuel prices. This makes hydropower one of the least costly sources of electric power available today.





Water Supply and Irrigation

Some of the water stored in our lakes is used as water supplies for local communities and for irrigation needs of ranchers and farmers. Water storage is managed by contract. The Tulsa District has 128 contracts at 29 lake projects in Kansas, Oklahoma and Texas. These contracts allow water users to store 1.7 million acre-feet of water which serves the needs of about 3.2 million customers. The fees charged for the contracts return \$5.9 million to the Treasury of the United States annually.

Water Quality and Fish and Wildlife

Maintaining the natural environment is a critical component of the Corps of Engineers mission. At our lakes, we balance the needs of the natural environment with the need for development. Water releases are occasionally needed to maintain life sustaining environment downstream of our dams. Water quality releases are made in coordination with state and federal fish and wildlife agencies and state regulatory agencies.

Land around Corps lakes is managed to protect and enhance native ecosystems. Land use policies for the federal property limit development, and our shoreline management plans help to guide the private and public development along the shoreline.

Recreation

Nationally, visitors to Corps lakes spend an estimated \$12 billion a year on trip-related expenses such as gas, food and lodging. These dollars support 500,000 jobs nationwide.

At Tulsa District's Eufaula Lake, for example, some 2 million annual visitors spend an estimated \$30 million within 30 miles of the lake. That



money adds to the local economy by supporting jobs and generating income.

Each year, Tulsa District collects about \$4 million from camping, day use fees for the use of swimming beaches and boat launch ramps, group picnic facilities and special event fees. These user fees are returned to the United States Treasury, and Congress uses those fees to offset the regular appropriations used for lake operation and maintenance.

Government Land-Lease Benefit

Corps lake projects directly benefit the counties in which they're built through lease payments to the state. The Corps grants leases for marinas, parks, and agriculture and grazing purposes. Public law requires that 75% of money received be paid to the state. The state, in turn, uses the funds to benefit public schools, roads, or other expenses in the counties where the leased property is located.

Where Does Water Go?

Tulsa District operates 32 multipurpose lakes in two major river basins—the Arkansas River basin in the northern half of the district and the Red River basin in the southern half of the district. Those basins drain some 164,000 square miles. The flow from the Arkansas River goes easterly through Arkansas to the Mississippi River. The flow from the Red River goes east to join the Mississippi River in Louisiana.

The Corps water resource projects have helped transform the landscape from the Dust Bowl in the 1930s to a land rich with sparkling lakes today.

Lake Level Fluctuations

Changing lake levels is a sign of a lake doing its job. The amount of water released is based on conditions throughout the river basin. The lakes are operated as a system of projects with consideration given to all authorized purposes. As water is released, the lake level may drop. As water flows into the lake, the water is replaced and the lake level rises.

Under normal conditions, lake levels are maintained as close to their respective full pool level as possible. Lake levels may fall during the summer because of low seasonal rainfall and high hydropower demands.



How Corps Lakes are Managed



Corps Projects Have Congressional Interest

"As Chairman of the Senate Environment and Public Works Committee which oversees the Corps of Engineers, I am fully aware of the quality work done by the Corps in Oklahoma and the nation. The importance of Corps managed lakes in Oklahoma cannot be overstated and this informative booklet provided by the Corps represents their commitment to reaching out to the public, efforts I enthusiastically support."

United States Senator
James M. Inhofe
Oklahoma

"Whether it is protecting us from floods, irrigating our fields or providing recreational opportunities for our families, the Corps of Engineers balances the unique needs of communities, businesses and the environment to the better of us all. I applaud the Corps for their efforts to outline their priorities and policies in this brochure. This is a useful tool in understanding the Corps work in maintaining the lakes, rivers and streams throughout Kansas."

United States Senator
Pat Roberts
Kansas

Our Pledge—We're Listening

The U.S. Army Corps of Engineers has been a steward of national environmental resources for more than 100 years. Our traditional values include:

- Conserving our nation's natural resources.
- Working to fully provide the purposes designed into each project — the flood control, water supply, hydropower, navigation, recreation, water quality, fish and wildlife, and flow regulation purposes critical to the communities served by our projects.
- Protecting resources for future generations.

We want you to know that Tulsa District employees:

- Are committed to being a vocal proponent for environmental stewardship, protection, compliance, and restoration practices.
- Have pledged to follow the laws of this great land and will not waver in implementation.
- Will continue to manage projects in cooperation with federal, state and local agencies, and the private sector.



The management of the Corps of Engineers lakes is “behind the scenes” but you have a voice in how the Corps of Engineers is meeting expectations. We need to hear from you.



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