



Skiatook Lake Water Management

Frequently Asked Questions (FAQs)

U.S. ARMY CORPS OF ENGINEERS

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Q1: Why is Skiatook Lake so low?

A1: A combination of factors is contributing to the current lake level. Skiatook has been in a drought since 2010 with below normal precipitation and very low inflows. The period of 2011-2014 has been the lowest 4-year inflow period since the lake was impounded.

Evaporation of water is also a contributing factor. On an average year, Skiatook Lake loses more than 5 feet (63") of water to evaporation. When the Skiatook Lake basin does not get enough rain, the combination of evaporation and ongoing water usage will cause the lake level to drop. The primary ongoing water usage from Skiatook Lake is for municipal/ industrial water supply and water quality. The lake is designed and required to allow authorized project purpose releases for water supply and water quality to continue during drought periods.

In addition, Skiatook Lake's watershed is only 354 square miles and is fed by Hominy Creek. The lake itself is relatively large with a conservation pool of 310,086 acre feet. It would take 16.4 inches of runoff over the watershed to completely fill an empty conservation pool. In contrast, Keystone Lake has a smaller conservation pool (234,758 acre feet) and is fed by the Arkansas and Cimarron Rivers with a contributing drainage basin area of 22,351 square miles. It would take only 0.2 inches of runoff from the Keystone basin to completely refill the conservation pool.

Q2: What are the Congressionally authorized purposes of Skiatook Lake?

A2: U.S. Army Corps of Engineers projects such as the Skiatook Lake are multipurpose. The Congressionally authorized purposes of this project are flood control, water supply, water quality, recreation, and fish & wildlife. Project purposes with allocated storage are flood control, water supply, and water quality.

Q3: Why are there water releases from Skiatook Dam during drought?

A3: Skiatook has significant storage in the conservation pool that has been allocated for water quality and water supply. This storage was designed to be used for these purposes through drought times. The Cities of Sapulpa, Sand Springs, and Skiatook have water supply agreements for use of the lake's water. These cities pay the Federal treasury for this use that ensures drinking water through a drought. The Congressionally authorized purpose of water quality is achieved through releases to help meet the requirements of National Pollutant Discharge Elimination System (NPDES) permits of several entities. These permits require certain low flows to be maintained downstream. During wetter periods, runoff from the Bird Creek basin may completely satisfy the requirements and no Skiatook releases are made. During drier times, Skiatook releases are necessary to make up any differences between what is required and what the basin is producing.

Q3: What are the low flow requirements?

A3: The low flow requirements of these NPDES permits vary throughout the year, but average approximately 100 cubic feet per second at the Sperry gage. Releases from Skiatook are not required when runoff from the rest of Bird Creek meets these requirements. During drought periods when Bird Creek is running low, Skiatook Lake releases are made to ensure the low flow requirements are met and the permits are not violated. We now have an approved deviation to change the measurement point from the Sperry gage to the Owasso gage.

Q4: What is a deviation?

Q4: U.S. Army Corps of Engineers projects such as Skiatook must be operated based on approved Water Control Plans. These plans are based on the Congressionally authorized project purposes. Deviations are temporary changes to the water control plan. These deviations are coordinated with local internal and external stakeholders to determine their value. After this coordination, deviations are sent to the Corps Southwestern Division office in Dallas for final review and approval.

Q5: We have heard there is a deviation for Skiatook Lake. What is it and will it save Skiatook water?

Q5: The recent Skiatook deviation is intended to save water while still meeting downstream permit conditions and environmental requirements. The proposed deviation seeks to use a newer downstream stream gage (the Owasso gage) for measuring low flow requirements. The Owasso gage has a slightly greater watershed area than the Sperry gage and thus may have slightly higher flows to meet the low flow requirements. In addition, the deviation also provides for a three day, rolling daily average instead of instantaneous flow measurements. This would provide some flexibility for meeting the low flow requirements without violating the NPDES permits. During the temporary deviation period, the impacts will be monitored for water savings. If effective, the changes to the water control plan may be made final.

Q6: How can recreation become a higher priority?

A6: Project authorization mandates us to strive to balance project purposes. In order to specify one project purpose as a higher priority, legislation to amend or change the existing authorizations would have to be passed by Congress. For recreation to have allocated storage within Skiatook, as water quality and water supply do, storage would have to be reallocated from one purpose to another.

Q7: Who determines the amount of water available for water quality and water supply?

A7: Congress must specify or authorize the amount of specific storage allocations. Approximately 79 percent of conservation storage is allocated to water quality usage. The remaining storage in the conservation pool is allocated to existing and future water supply users. Although the reservoir is authorized for other purposes, such as recreation or fish and wildlife, no specific storage amounts have been allocated for these other uses.

Q8: What is conservation storage?

A8: From top to bottom, reservoirs typically have three "pools" – the flood pool, the conservation pool, and the inactive pool. The design elevations of the pools do not change although the lake level fluctuates depending on rain, evaporation, and water use. The conservation pool at Lake Skiatook refers to the volume of water contained between the top elevation of 714.0 ft above mean sea level down to 657.0. The volume of water in the conservation pool is considered to be set aside as "storage" to satisfy congressionally authorized project purposes such as water supply and water quality.

The top of the conservation storage marks the bottom of the flood pool, which is used for temporary storage of excess water following heavy storms. The bottom of conservation storage marks the top of the inactive storage pool, the part of the reservoir designed for storing sediment, typically holding lower quality water due to its depth.

Q9: What is the District Drought Contingency Plan?

A9: Each Corps of Engineers project has a drought contingency plan. The drought contingency plans provide a basic reference for water management decisions during a water shortage induced by drought. The plans provide four levels of response which are progressively initiated as the drought intensifies.

Q10: What are the drought levels in the plan?

A10: There are four drought levels in the District Drought Contingency Plan:

- Drought Level 1 – elevation 714 – 705.7.
- Drought Level 2 – elevation 705.7 – 695.6
- Drought Level 3 – elevation 695.6 – 681.9.
- Drought Level 4 – elevation 681.9 – 657.0.

Q11: What actions do the drought levels trigger?

A11: (1) Level I. Level I operations extend from 100 percent to 75 percent of conservation storage. This level is designed as an alert phase in which the water managers monitor the onset of an apparent drought situation. The plan requires normal operational procedures and coordination for monitoring of storage, users, releases, seasonal pool plans, deviations, etc. as needed to perform normal low flow activities and disseminate status reports within the Corps, other agencies, and users.

(2) Level II. Level II operations extend from 75 percent to 50 percent conservation storage. In addition to the ongoing actions of Level I, a Corps Drought Management Committee (IDMC) will be activated by the District Commander. The CDMC will act to ensure that the various elements of the District are responding to the drought with a concerted effort and coordinate requests and actions with the appropriate state and Federal agencies. Water Management Personnel will forward requests for action to the CDMC and will carry out the CDMC plans and deviations. The District Commander will call an ad-hoc meeting of the Interagency Drought Management Committee (IDMC) within 60 days of activating the CDMC and brief the members on the current and projected reservoir conditions.

(3) Level III. Level III operations extend from 50 percent to 25 percent conservation storage. In addition to the ongoing actions of Levels I and II, Level III requires the District Commander to activate the IDMC. The IDMC will act as an interface between the CDMC and water users within the basin. The IDMC will consolidate state and federal positions on drought actions and provide the CDMC with justifications, priorities, and suggested actions, which will serve the most critical needs with the remaining project storage.

(4) Level IV. Level IV operations extend from 25 percent to 0 percent conservation storage. Level IV continues the ongoing actions of Level III with increased focus on the depletion of conservation storage.

Q12: Why is Skiatook still low while other area lakes are normal?

A12: The lakes in our region can differ in authorized purpose, design, and watershed characteristics. Because of these differences, some lakes are more susceptible to low lake levels than others. Skiatook has been in a drought since 2010 with below normal precipitation and very low inflows. The period of 2011-2014 has been the lowest 4-year inflow period since the lake was impounded. This is the primary reason Skiatook is so low. In addition, Skiatook has authorized project purposes that require releases from the lake. There are three “users” of water from Skiatook Lake. Evaporation is one of the largest “users” of water and accounts for just over 45 percent of the total use. Other users are water quality at just over 45 percent and water supply at approximately 9 percent. The lake is designed and required to allow authorized project purpose releases for water supply and water quality to continue during drought periods. When the Skiatook Lake basin does not get enough rain, the combination of evaporation and ongoing water usage will cause the lake level to drop.

In addition, Skiatook Lake's watershed is only 354 square miles and is fed by Hominy Creek. The lake itself is relatively large with a conservation pool of 310,086 acre feet. It would take 16.4 inches of runoff over the watershed to completely fill an empty conservation pool. In contrast, Keystone Lake has a smaller conservation pool (234,758 acre feet) and is fed by the Arkansas and Cimarron Rivers with a contributing drainage basin area of 22,351 square miles. It would take only 0.2 inches of runoff from the Keystone basin to completely refill the conservation pool. Because of these watershed characteristics, Skiatook is more difficult to refill than other reservoirs.

Q10: What has the Corps done to manage the drought?

In October 2014, the Interagency Drought Management Committee (IDMC) was activated. The IDMC committee initiated discussion and research on ways to try to minimize water quality flow releases. These alternatives were coordinated with state and federal agencies and resulted in final approval of a temporary deviation to the approved water control plan for Skiatook Lake that may allow for some reductions in water quality releases from Skiatook Lake.

Q13: Since we know there will be droughts, why doesn't the Corps anticipate droughts and take action before one occurs?

A13: In general, lakes are designed to mitigate droughts by storing water when it is available and releasing it to users when needed. Skiatook was designed to satisfy project purposes by the authorized use of conservation pool storage during droughts. The Corps models historical data including droughts, and incorporates that in water yield analyses used in determining conservation pool storage allocations. Skiatook Lake has been in a drought condition since August 2010, which is approaching 4.5 years in length.

Q14: Drought results in economic hardship to Lake Skiatook-area business and reduces the value of homes near the lake. Does the Corps consider this in the management of the water in the lake?

A14: Management of the water of the lake considers all Congressionally authorized project purposes, but some purposes have allocated storage dedicated to that purpose. Water supply and water quality are both project purposes with allocated storage. There is no allocated storage for recreation.

Q15: Why can't you just stop releasing water from Skiatook Lake?

A15: Arbitrarily stopping releases from Skiatook would violate the congressionally authorized purposes of the lake. The Cities of Sapulpa, Sand Springs, and Skiatook have water supply agreements for use of the lake's water. These cities pay the Federal treasury for this use. The Congressionally authorized purpose of water quality is achieved through releases to help meet the requirements of National Pollutant Discharge Elimination System (NPDES) permits of several entities. Without these releases in the times when Bird Creek is running too low, violations of the permits would occur. Without the releases, these local entities and the citizens they serve would be required to pay for expensive environmental studies and wastewater treatment plant upgrades.

Q16: Is evaporation really a major contributor to the low pool elevation of Skiatook Lake?

A16: On an average year, Skiatook Lake loses about 5 feet (63") of water to evaporation. On a hot day, evaporation can remove over 150 million gallons of water from the lake. Evaporation is one of the largest "users" of water from Skiatook and accounts for just over 45 percent of the total use. Other users are water quality at just over 45 percent and water supply at approximately 9 percent.

Q17: Which boat ramps are usable while the lake level is so low? Can I still use the lake?

A17: The following list of Corps operated boat ramps are open and available for use. Tall Chief Cove, Osage, Skiatook Point, Bull Creek, and Black Dog boat ramps are still available for use and safe at the current lake elevation. The boat ramps at Twin Points and Hominy Landing are temporarily closed. Although the lake is at very low levels, it is still open to all users. We do recommend that boaters use caution due to the low lake levels.

Q18: What is the lowest elevation that the lake has ever seen?

A18: We are currently experiencing record low lake levels since September of 1986 and the initial fill period of the reservoir.

Q19: Where can I find information about the water level of Lake Skiatook?

A19: Updated information is available daily in a couple of different places on our homepage. Current readings for Lake Skiatook are available at <http://www.swt-wc.usace.army.mil/skia.lakepage.html>. The lake level is available there as well as historical information about the lake's level. The Tulsa District also provides a Water Control Data Page <http://www.swt-wc.usace.army.mil/>. Daily lake conditions, real-time gage information, and more information are available at this site.

Q20: Where can I learn more about the drought?

A20: The U.S. Drought Monitor provides a weekly drought summary and a drought outlook. It is available at <http://droughtmonitor.unl.edu/>. We publish a Reservoir Drought Update weekly when any of the Tulsa District lakes are in drought. It is available on our homepage at <http://www.swt.usace.army.mil/Home.aspx>.

Q21: What would it take to refill the conservation pool at Skiatook?

A21: The only way to break the drought is with lots of rain. Currently, it would take nearly 8 inches of runoff from the entire watershed to refill Skiatook Lake. A single rain event is unlikely to produce this much runoff. What we need is a prolonged rainy period that saturates the soil and then refills the streams and creeks flowing into the lake.