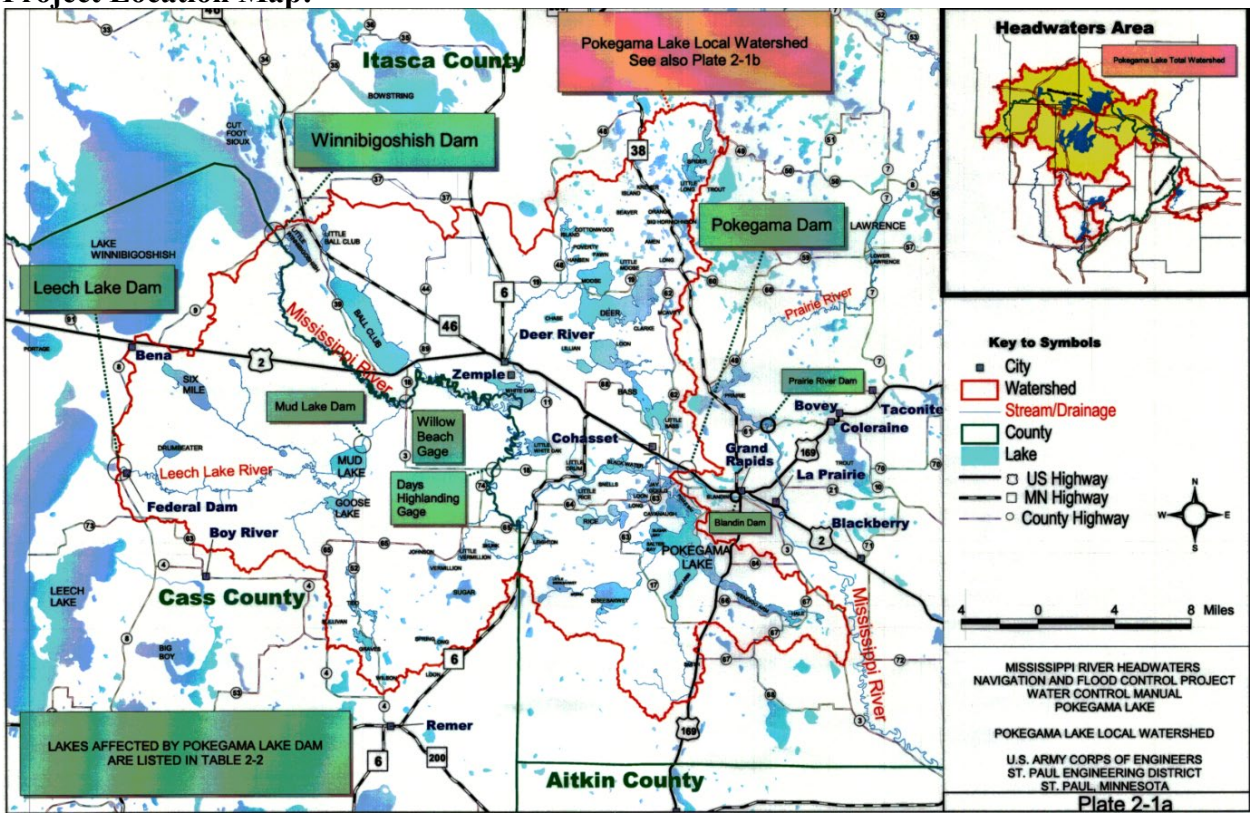
Reservoir Summary: Pokegama Lake and Pokegama Lake Dam

Project General Objectives: The reservoir is regulated primarily for recreation, flood control, fish and wildlife and Tribal Trust. The Water Control Plan supports recreation by maintaining, when possible, stable reservoir levels within a specified elevation band during the summer. Flood control objectives are met by a fall/winter drawdown schedule and a designated flood control storage pool, which provides storage capacity for spring and summer flood events. Water levels are managed, when conditions permit, for various fish and wildlife and Tribal Trust concerns. The low-flow plan manages water resources both upstream and downstream of the dam during critical periods.

Project Location Map:



Pertinent Data:
Datum = NGVD 29

Pokegama Lake	**Elevation in Feet**	**Area in Acres**	**Cumulative Storage in Acre-Feet**
Top of Control Structure	1278.42	24,800	203,000
Maximum Operating Limit	1278.42	23,200	158,000
Normal Summer Pool Level	1273.42	16,800	98,000
Minimum Operating Limit	1270.42	12,000	55,000
Sill	1264.42	---	0

HYDROLOGY

Drainage Area	3,265 square miles
One Inch of Runoff Equals	35,200 acre-feet
Storm Types	Thunderstorm, frontal rain, snow
Flood Season	March - June
Low Flow Season	July - October
Minimum Daily Inflow	Flow is very low during dry periods.
Minimum Mean Monthly Inflow	Flow is very low during dry periods.
Minimum Mean Annual Inflow	No flow at times
Maximum 24-hr. Average Inflow	8,480 cfs, 9 April 1952
Maximum Mean Monthly Inflow	4,570 cfs, April 1906
Maximum Mean Annual Inflow	2520 cfs, 1901
Average Annual Inflow	1,200 cfs
Average Discharge	1176 cfs (101 years of record)
1950 Flood Volume	281,000 acre-feet
Name and Location of Stream-Flow Station	Grand Rapids, Minnesota 3 miles downstream of dam
Typical Maximum Snowpack	15 - 31 March
Number of Sediment Ranges	None

Watershed Characteristics

Pokegama Dam was built on the outlet of Pokegama Lake, on the Mississippi River headwaters. The runoff from Pokegama Lake watershed is slow and significantly attenuated as a result of the relatively flat topography and the presence of many lakes and wetlands. There are 3,265 square miles of drainage area above Pokegama Dam. There are 660 square miles of local drainage area between Pokegama and the upstream reservoirs (Winnibigoshish and Leech) of which 64.5 percent is dry land, 8.5 percent is water, and 27 percent is wetlands. In general, the land not covered by wetlands is forested. The average overland slope is 5.6 feet per mile. A very large portion of the inflow to Pokegama reservoir following a precipitation or snowmelt event comes from discharges from Winnibigoshish and Leech Lake Dams. Discharges from those two dams generally take 30 to 36 hours to reach Pokegama reservoir. A significant portion of the local area is non-contributing.

This geology along with a climate and pronounced spring snowmelt creates fairly consistent flows with the peak occurring from spring melt. **Figure 1** shows a duration hydrograph of the discharges from the Mississippi River at Grand Rapids located 3 miles downstream of Pokegama Dam.

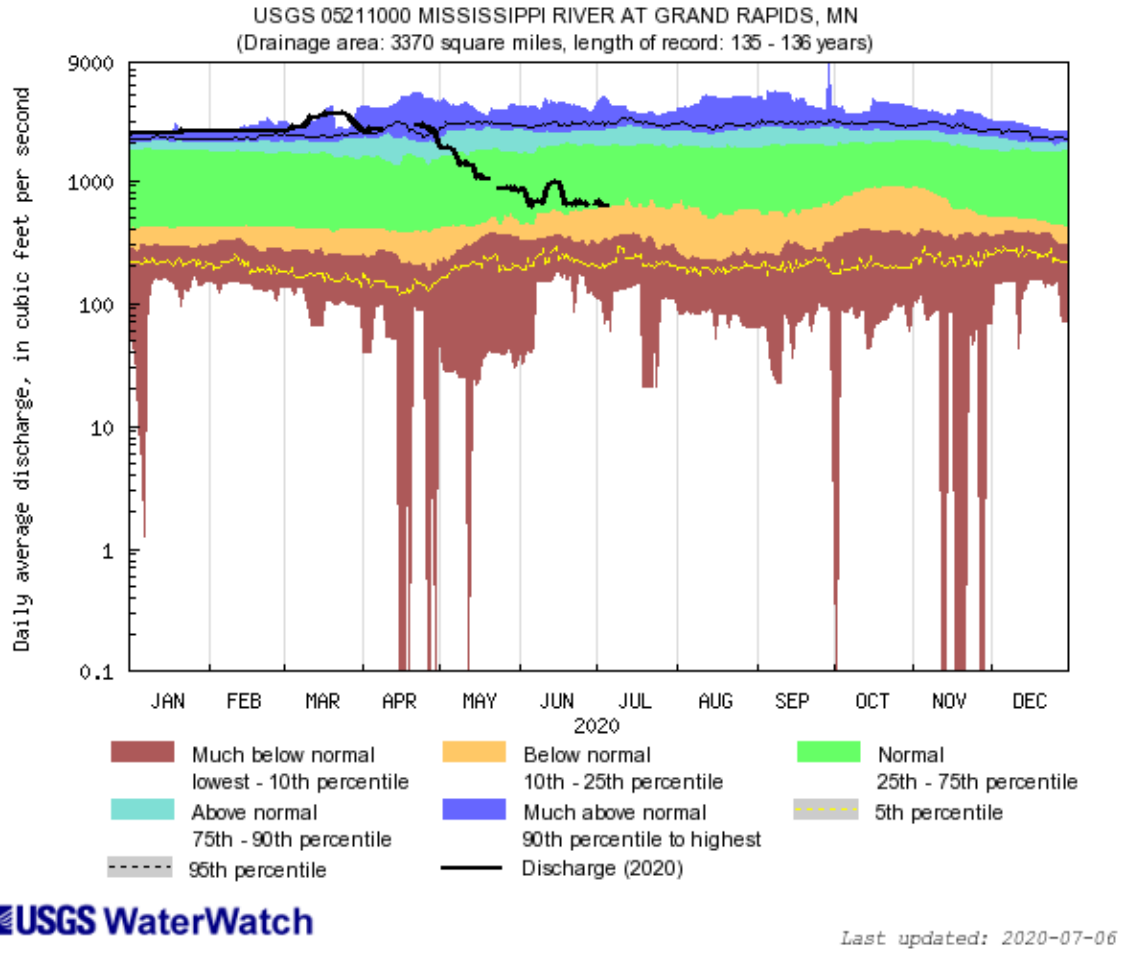
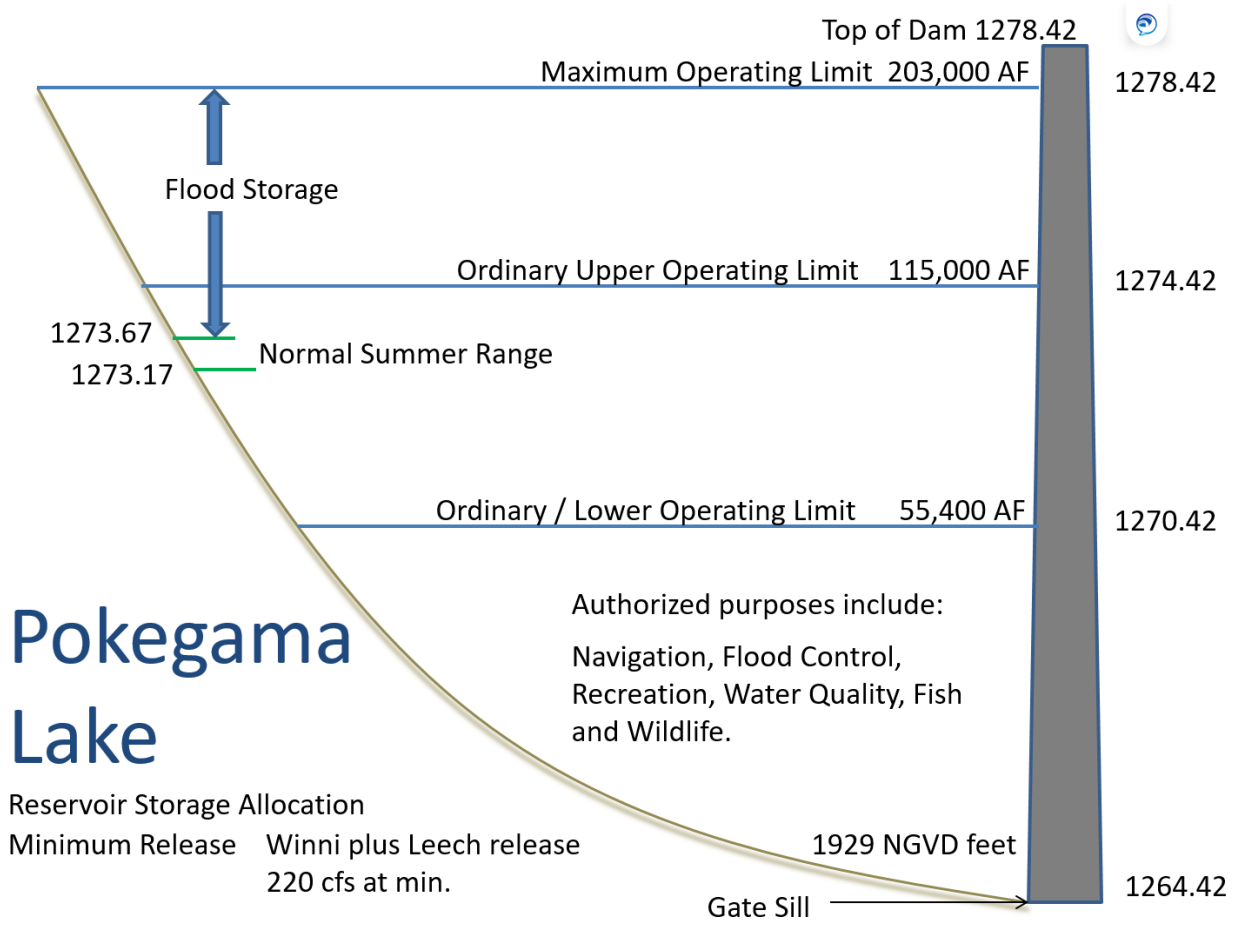


Figure 1. Duration hydrograph for Pokegama Lake discharges.

Pool Allocation



Overall Plan for Water Control

Pokegama Lake reservoir is regulated between a minimum elevation of 1270.42 feet and a maximum elevation of 1278.42 feet. If possible, the reservoir level should be within its summer range/band of 1273.17 feet to 1273.67 feet by the first day of the fishing season (approx. mid-May). The winter drawdown of the reservoir for spring flood control begins in the fall. The ordinary (normal) spring drawdown elevation is 1270.42 feet, which is the lower operating limit of the reservoir. Significant shoreline erosion begins to occur at approximately elevation 1274.42 feet but storage to elevation 1278.42 feet can be used if needed to prevent flooding downstream. Regardless of the season, the flood control operation is coordinated with Winnibigoshish and Leech reservoirs for flood control at Aitkin, MN and, if necessary, other downstream areas.

The Water Control Manuals (WCM) are in the process of being updated with the findings of the 2009 Reservoir Operating Plan Evaluation (ROPE) Study. The table below summarizes reservoir operation for both the WCM and ROPE parameters.

TABLE S-6 POKEGAMA LAKE OPERATING RULES		
	CURRENT	FINAL
Summer Band (elev. - feet)	1273.17-1273.67	1273.17-1273.67
Summer Target (elev. - feet)	1273.42	1273.42
Band Width (feet)	0.5	0.5
Normal Drawdown (elev. - feet)	1270.42	1270.42
Maximum Drawdown (elev. - feet)	1270.42	1270.42
Rate of Release (change/day)	20-30%	20-30%
Spring Pulse	NA	2410 cfs
Minimum Flow Requirements	>=(1273.17): 200 cfs	>=(1273.17): 200 cfs
	<(1273.17): Winni + Leech	<(1273.17): Winni + Leech

Figure S-4. Final Plan Operating Hydrograph, Pokegama Lake