



LAKE LEVELS

LAKE LEVELS FLUCTUATE IN RESPONSE TO PRECIPITATION AND EVAPORATION TRENDS

- The level of Silver Lake fluctuated almost three feet from 2017 to 2021.
- The largest factor affecting the level of Silver Lake is the amount of annual precipitation in the 4.3-square mile watershed area.
- In times of sustained, above-average precipitation, the lake level increases.
- In July 2017, a 4" rain raised an already high Silver Lake to a height that exceeded the calculated 100-year flood, freeing boats and wave runners from their lifts and flooding many low-lying homes. The lake almost touched the bottom of the bridge over the outlet creek at the marina.
- The lake level drops during extended dry periods.
- The severe drought in 2021 saw the lake drop to one of the lowest in memory. The lake level was so low that the outlet creek had no water flow.

SILVER LAKE ALSO HAS AN ANNUAL LAKE LEVEL CYCLE

- Precipitation and evaporation also affect the level of the lake during the year.
- During spring, rains usually exceed evaporation to raise the lake level.
- During mid- to late summer, high temperatures increase evaporation, drier conditions are typical, and the lake level usually drops.
- During the fall season, rains return, cooler temperatures reduce evaporation, and the result is constant or rising lake levels.
- In winter, ice cover limits lake evaporation, and, in years of average-to-heavy snowfall, the lake level is boosted by the spring thaw.

THE LAKE HAS A SINGLE OUTLET CREEK

- Silver Lake has a single outlet creek located at the marina in the southeastern corner of the lake.
- During normal conditions, the lake flows through the creek into the Fox River.
- However, there are times when the Fox River is higher than the lake. Under those conditions, the creek flows backwards and drains into the lake.

THE LAKE'S OUTLET CREEK HAS BEEN DAMMED FOR OVER 100 YEARS

- At the turn of the 20th century, records indicate that the ice harvesters obstructed the outlet in the fall to raise the water level for better ice harvesting.

- In the 1930's, the current lake level management concept became popular: Dam the lake outlet in the summer in order to maintain higher lake levels, followed by lowering the lake level in the fall to reduce winter ice damage.
- A dam based on this idea was first constructed in 1938. The dam has been reconstructed and repaired many times since then.
- The current shoreline along the outlet creek was constructed in the 1990's, and the boards in the dam were most recently replaced in the mid-2010's.

THE DAM IS PRIVATELY OWNED, BUT REGULATED BY THE WDNR

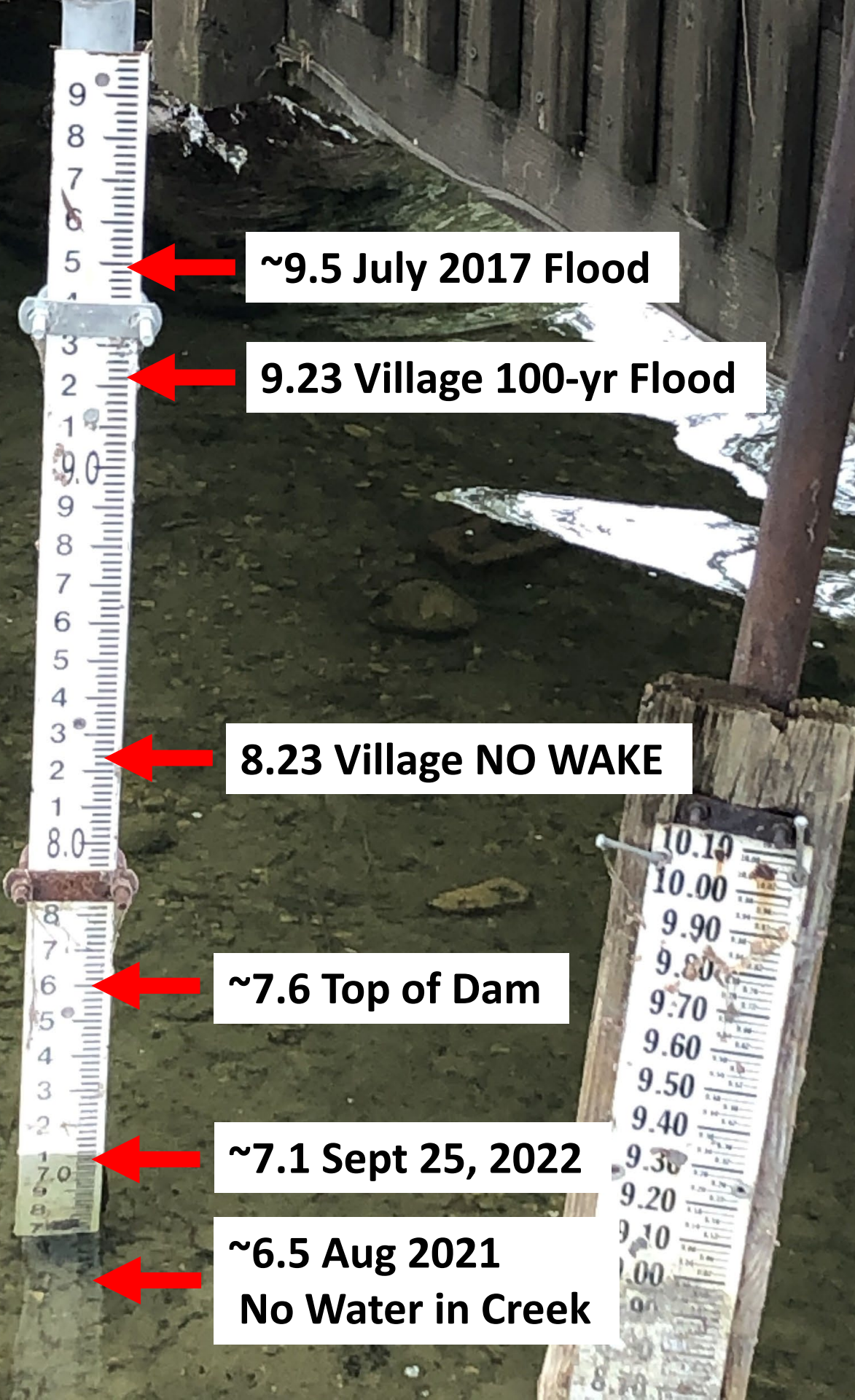
- The dam is privately owned, and the owner is responsible for the operation and maintenance of the dam.
- But the operation of the dam is regulated by the state.
- In 1944, the Wisconsin Public Service Commission (prior to the WDNR being formed) determined the "summer elevation" to be at a level which is about 6-1/2 inches below the top of the I-beam attached to the culvert going under Silver Lake Road. There is a horizontal stain on the concrete which approximates this level.
- Per the ruling, the dam boards must be removed if the lake is at a "high level" which is a few inches above the "summer elevation."
- The dam boards must also be removed by October 15 and not replaced until after the spring thaw.
- Finally, the outlet creek below the dam is supposed to have a minimal flow.
- Per both the dam owner and the WDNR, the dam is currently in working condition and is performing its designed function.

THE VILLAGE INSTALLED A LAKE LEVEL GAUGE AND INSTITUTED "NO WAKE" PROVISIONS

- In 2019, the Village of Salem Lakes installed a new lake level gauge on the outlet creek.
- By ordinance, "No-Wake" rules are put into effect when lake exceeds 8.23.
- The Village also identified the 100-year flood at an elevation of 9.23.
- The July 2017 flood was about 4" higher than the 100-year flood.
- During the 2021 drought, the lake level was below the bottom of the gauge.

LAKE LEVEL COMPLAINTS ABOUND, BUT THERE ARE NO CONSISTENT LAKE LEVEL RECORDS

- The WDNR, the dam owner, and the Village of Salem Lakes report that there have been many, many complaints over the years about both high and low water levels on Silver Lake.
- Inasmuch as there are no continuous, consistent lake level records, the Silver Lake Management District has instituted a program to record the monthly level of Silver Lake, from April through November, using the Village of Salem Lakes gauge.
- This record will eventually provide accurate data on the fluctuation of the water level of Silver Lake over an extended number of years.



~9.5 July 2017 Flood

9.23 Village 100-yr Flood

8.23 Village NO WAKE

~7.6 Top of Dam

~7.1 Sept 25, 2022

**~6.5 Aug 2021
No Water in Creek**





July 2017 Flood

Fall 2021 Drought





The Dam Fall 2022



Outlet Creek Culvert Under Silver Lake Road. Note the "summer" water level.