

Some Lake Sammamish Flood Control Project Facts:

The Sammamish River Flood Control Project (FCP) is 14 miles long and is comprised of the entire length of the Sammamish River, from the mouth of Lake Sammamish to Lake Washington. The intake section or Transition Zone is one section of the FCP, an 1800 foot section near Marymoor Park that includes a Weir and drops approximately 7 feet over a 1450 foot length in the Transition Zone. The remaining length of the FCP drops another 7' as it meanders into Lake Washington.

The project was designed so that the improved river channel would carry floods of record (Mar 1 and after- spring floods) without inundating adjacent farmlands, and without Lake Sammamish exceeding 29.0 feet NGVD. **1965 ACOE Design Manual**

The Weir is a solid concrete dam engineered and constructed in 1964 by the Army Corps of Engineers as part of the FCP. It was modified in 1998. It's purpose is to maintain a minimum Lake Sammamish water level through the summer months .

In recent years, increased density of the vegetation paired with backwater effects from Bear Creek (a tributary of the Sammamish River) have decreased the transition zone's effectiveness at providing lake level control for extreme high flow events. The County has reduced overgrowth in order to help the transition zone control flooding effectively. **(Sammamish River History - KC)**

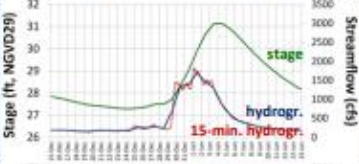
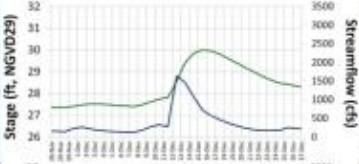
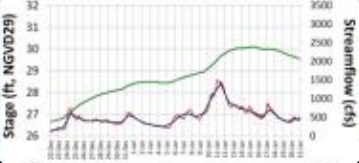
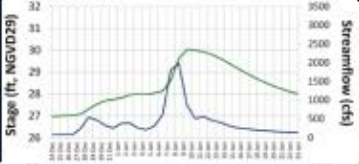
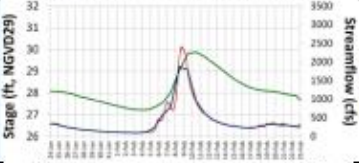
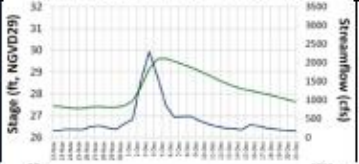
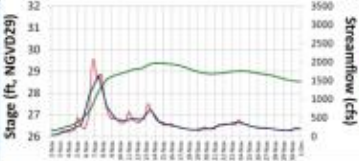
The above is from King County. The county's efforts have not been adequate as evidenced by flooding events.

King County reviewed previous studies on the Sammamish River (USACE 1974; Northwest Hydraulic Consultants 1991; USACE 1997; USACE 2001; West Consultants 2004, all as cited in Chin et al. 2003). Some highlights from the earlier work are applicable to the current analysis:

- The Sammamish River is a backwater system, which means that features downstream in the river can affect water levels upstream in the river.
- During higher flows, the lake levels are largely affected by flows in Bear Creek, Redmond.

Based on nearly 50 years of observed peak flows since construction of the weir, the 10-year flow in the Sammamish River downstream of Bear Creek is currently about 2,000 cfs, which is 33 percent higher than the 10-year flow characterized by the Corps during project design. **(P 3 Willowmoor Design Hydrology Executive Summary)**

Table 8. High Lake Sammamish events ordered by rank of peak lake elevation, indicated in the first column. Columns 5 and 6 give the event's rank with respect to peak daily and 3-day flows on Issaquah Creek (for 1976-2013). The last column gives the associated Bear Creek peak flow and rank in the Bear Creek record (1988-2013).

Lake Level Rank	Date	Lake Sammamish Stage at Weir and Issaquah Creek Hydrograph	Event Characteristics		Daily Inflow Ranks		Bear Cr Peak Q (Rank)
			Peak	3-day	Peak	3-day	
1	Jan 1-9, 1997		This event generated the highest of all recorded lake stage values (31.14 ft). The peak daily flow from incoming Issaquah Creek was not as exceptional but the event was prolonged , lasting over 6 days. Bear Ck discharge was highest in record, impairing lake rating curve.	8	4	1572 cfs (2)	
2	Dec 13-19, 2010		Daily peak flow from incoming Issaquah Creek was not as extreme, though 3-day inflows were high, and the event was not exceptionally prolonged (about 4 days long). Backwater due to high Bear Ck discharge is suspected as the cause for the exceptionally high stage.	12	7	1068 cfs (3)	
3	Jan 11-21, 2006		Daily peak flow from incoming Issaquah Creek was unremarkable but the event followed a series of smaller events that built up lake levels over the preceding weeks.	18	13	587 cfs (13)	
4	Jan 8-14, 2009		This event had extremely high inflows from Issaquah Creek and the event followed a series of smaller events that built up lake levels over the preceding 10 days.	5	2	619 cfs (11)	
5	Feb 8-12, 1996		This event had extremely high inflows from Issaquah Creek and was prolonged , lasting about 7 days.	6	3	941 cfs (5)	
6	Dec 4-6, 1975		This event had the second highest peak inflow from Issaquah Creek and was prolonged , lasting over 5 days.	2	1	n/a	
7	Nov 14, 2006		This event had moderately high inflow from Issaquah Creek , and was followed by several smaller events that kept lake stage at a high level for about 3 weeks.	11	11	329 cfs (73)	

This chart does not include the 2020 Flooding event where lake levels exceeded 31 feet NGVD. The primary response by King County Flood Control was Bear Creek Discharge caused water damming effect and back watering. Feb 2020 Peak Bear Creek Flows peaked around 1050 cfs .

Analysis of lake levels, however, shows a significant increase in the amount of time that Lake Sammamish exceeds the Corps-defined ordinary high water (OHW) level of 27 feet NGVD (30.6 feet NAVD). This is consistent with anecdotal reports from lakeside homeowners. Both visual inspection and statistical tests suggest that higher lake levels begin around 1998, and these changes would be consistent with weir modifications that reduce lake outflow at low to moderate lake levels.

It is interesting to note that nearly 90 percent of the events where the lake has exceeded 29 feet NGVD (32.6 feet NAVD) since 1964 have occurred since 1989, when annual TZ maintenance was discontinued. In contrast, only half of the highest Issaquah Creek flows in the same period have been since 1989. (Issaquah Creek is the largest tributary to Lake Sammamish and the only one with a streamflow record extending back to completion of the Sammamish River project.) **(Page 4 Willowmoor Design Hydrology)**

The Army Corps decertified the FCP in 2008 due to insufficient maintenance by King County. The County has shown no will to make the corrections needed to recertify.

The Willowmoor Project was undertaken by King County in the early 2000's with various concepts and options proposed to improve conveyance and habitat in the transition zone. Currently this project is in a dormant stage.

Has development played a role? Yes – stormwater runoff is a contributor to higher lake levels in lake Sammamish, which is designated as a stormwater “receiving body.” Lake inflow and outflow levels determine what happens at our lakeshore properties. Much depends on the starting lake level when the inflowing event occurs and/or the ability for the water to outflow in relation to the inflow.

A viable near-term option might be to lower the lake level in advance of major storms via a concept called a “Dynamic Weir.” This would enable the lake to absorb more inflow without going excessively high. King County has not completed a thorough study of this concept.

The Bear Creek Water Dam – Redmond has undergone a tremendous amount of development over the decades. Trees that once slowed rainfall rates and absorbed ground water have been replaced with structures and parking lots. High Bear Creek discharges back up the outflow from the lake during high water events, causing high and damaging peak lake levels.

Citizens have been raising the alarm for over 15 years regarding the flooding issue. To date it has been a lot of talk but no true corrective action. The problem remains.