Supplementary information

Table SI 1: Instrument configurations of the acoustic Doppler current profiler (ADCP) for different deployment periods. Avg denotes settings for the average sampling mode (mean flow velocity) and HR for the setting for the high-resolution sampling mode (vertical velocity only). The profiling range of each mode refers to the distance from the ADCP head, which was deployed approximately 0.6 m above the reservoir bed at a water depth of 12 m. Mean flow velocity was measured as averages over a varying number of individual measurements (pings) within the averaging interval. In HR mode, single-ping measurements were recorded at the respective sampling frequency.

		Range in distance from ADCP head (m)		Bin size (cm)		Sampling		
		Horizontal Velocities	Vertical Velocities			Averaging Number of pings	Averaging Time interval (min)	Sampling Frequency (Hz)
Start	**End**	Avg	HR	Avg	HR	Avg	Avg	HR
23-Feb-2018	15-Mar-2018	0.2 – 14.2	0.1 – 5.22	50	2	210	10	1
26-Jun-2018	11-Aug-2018	0.2 – 14.2	0.1 – 7.74	50	4	526	5	1
15-Aug-2018	25-Oct-2018	0.2 – 14.2	0.1 – 7.74	50	4	526	5	1
30-Oct-2018	10-Dec-2018	0.2 – 14.2	0.1 – 7.74	50	4	526	5	4
13-Dec-2018	05-Feb-2019	0.2 – 14.2	0.1 – 7.74	50	4	526	5	4
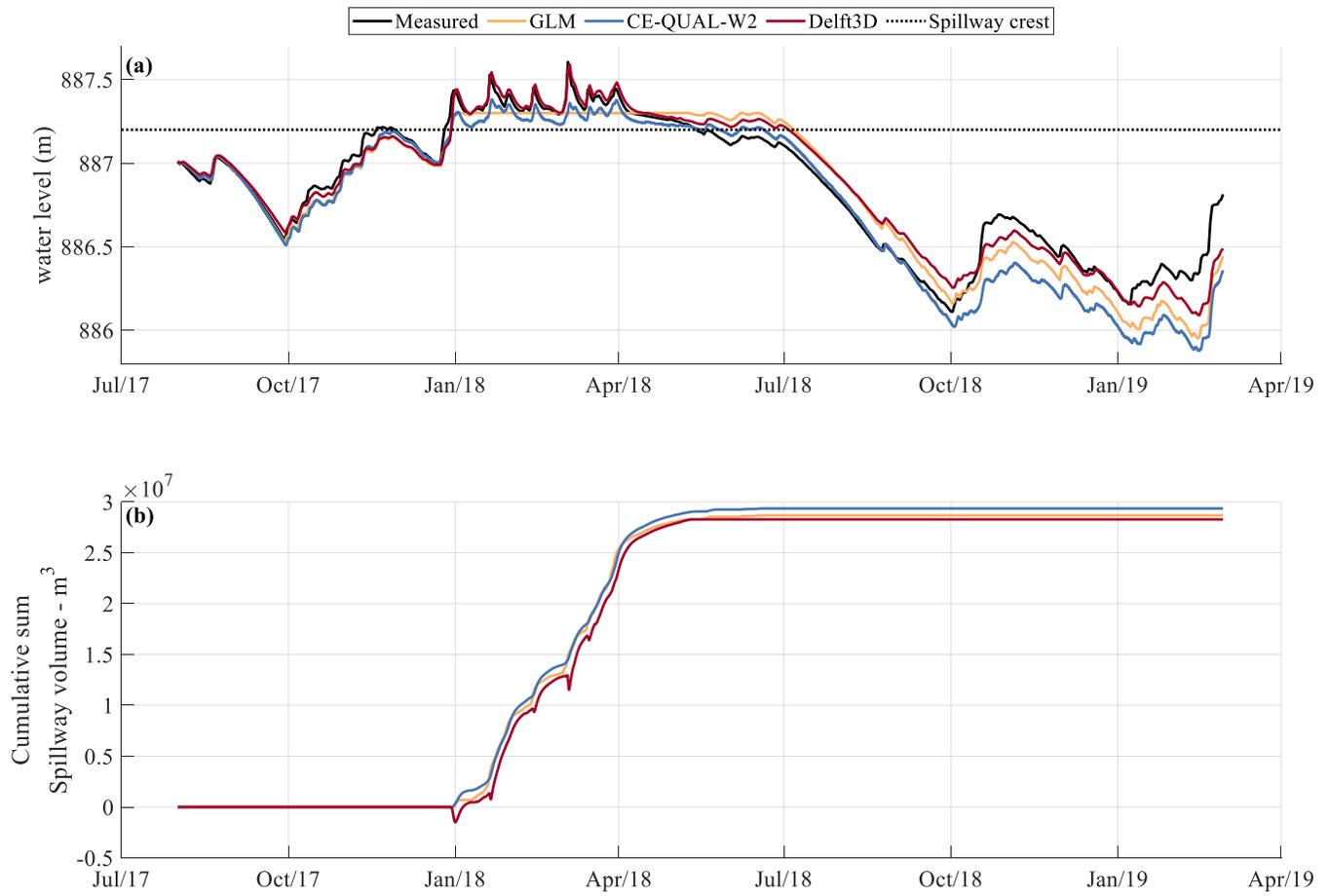
Figure SI 1: (a) **Time series of measured and simulated water level in hourly resolution, black dashed line is the spillway crest.** (b) **Time series of the cumulative sum of simulated spillway discharge in hourly resolution.**
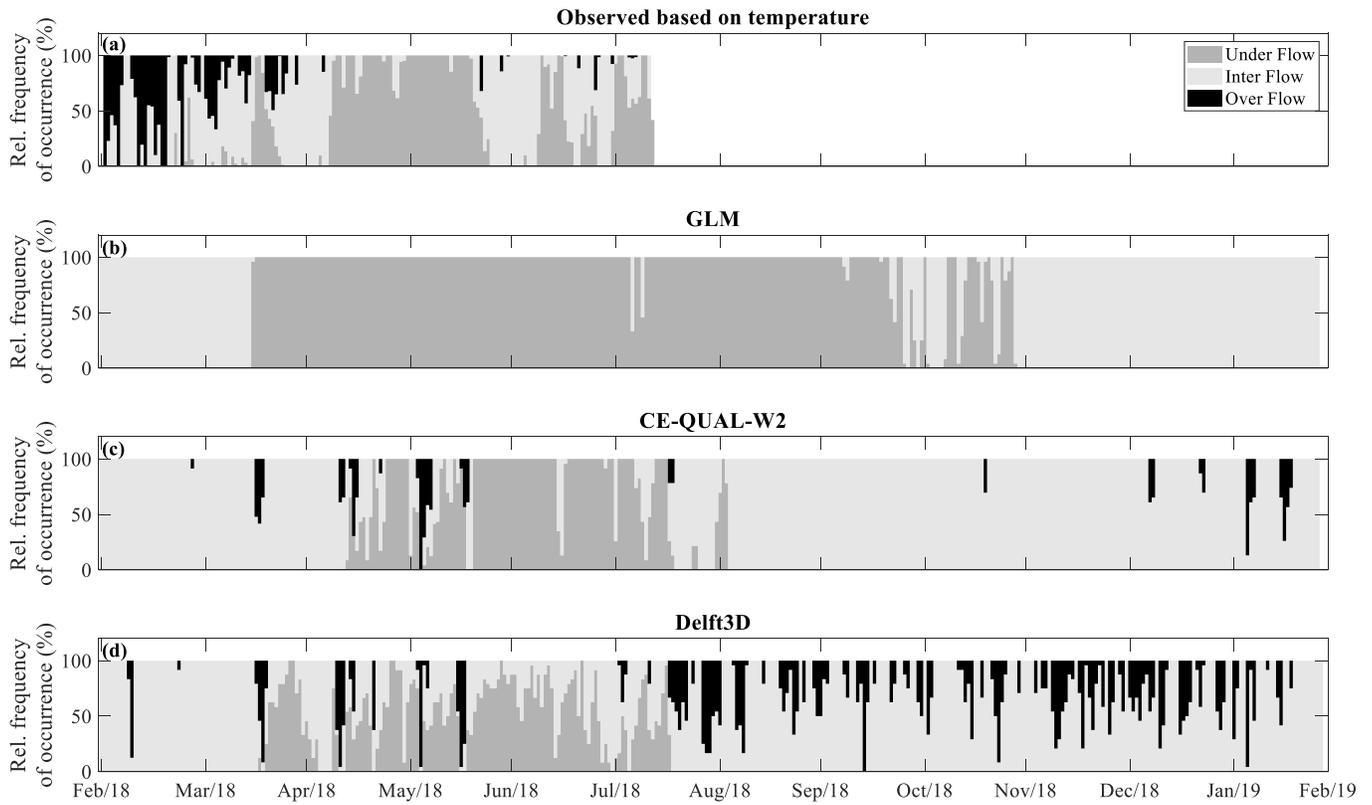
Figure SI 2: Time series of density currents classification in bar graphs. Each vertical bar represents one day and the length of each color represents the relative occurence of the respective density current over the 24h. (a) **time series of density currents classification based on observed temperature at Ferraria Bridge and compared to observed temperature profile at the Intake. Time series of density currents classification based on the simulation of tracers at the Intake for** (b) **GLM,** (c) **CE-QUAL-W2, and** (d) **Delft3D.**
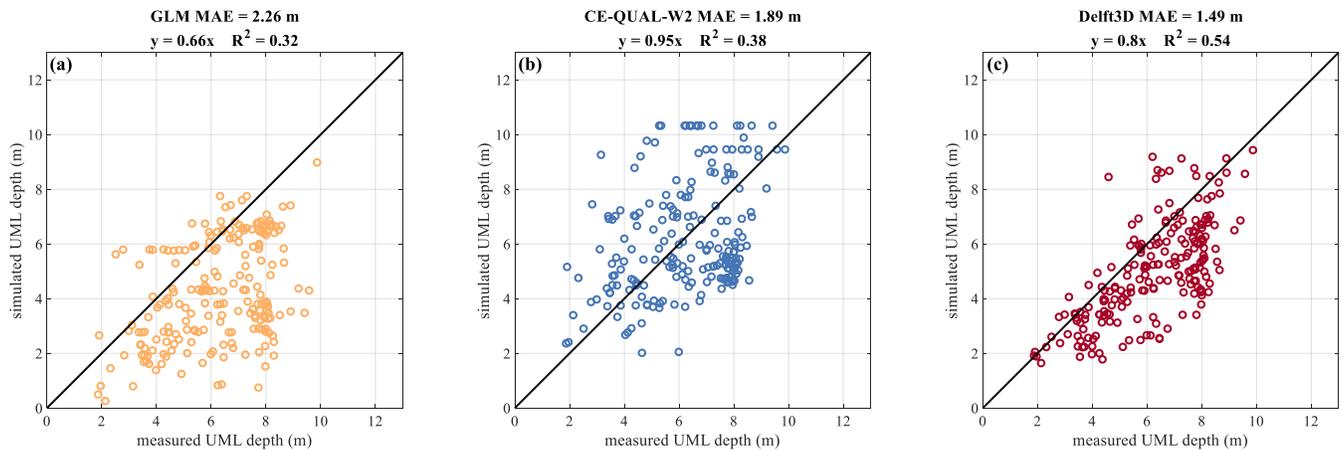
Figure SI 3: comparison of upper mixed layer (UML) depths estimated through Lake Analyzer (Read et al., 2011) of measured and simulated temperatures. The plots show at the title the mean absolute error (MAE), the linear fitting and the coefficient of determination (R^2) for (a) **GLM,** (b) **CE-QUAL-W2, and** (c) **Delft3D.**