

Supplementary Material

Table S1. Model fit for a linear regression between observed and simulated water temperatures (surface and bottom) for two simulation runs. One used the default equation “Clark” for the calculation of the longwave radiation balance in GETM, the other one used the “Idso” equation. All values were highly significant (p-value: <0.001).

<i>Clark</i>	surface	bottom	<i>Idso</i>	surface	bottom
intercept	-1.83	-1.44	intercept	-1.35	-0.98
slope	1.21	1.16	slope	1.04	1.00
r^2	0.964	0.974	r^2	0.948	0.958
<i>NSE</i>	0.83	0.91	<i>NSE</i>	0.92	0.93
<i>RMSE</i>	2.43	1.87	<i>RMSE</i>	1.61	1.64
<i>MAE</i>	5.89	3.50	<i>MAE</i>	2.61	2.68

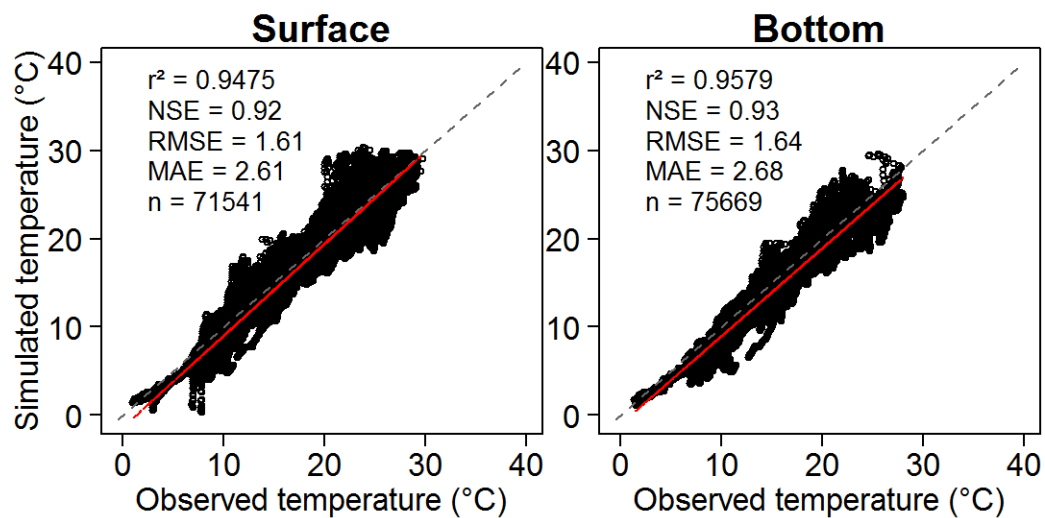


Figure S1. Simulated versus observed water temperatures for all stations at all times when data were available. r^2 : goodness of fit of linear model (red line), *NSE*: Nash-Sutcliffe Efficiency, *RMSE*: root mean square error, *MAE*: model absolute error, *n*: amount of samples. Grey dotted line: 1:1 line.

Table S2. Overview of data availability. Based on data availability, air temperatures could be compared for 2014-2015, wind measurements could be compared for 2015, simulated and observed water temperatures could be compared for 2016.

Data set	2014				2015				2016				Comments
	I	II	III	IV	I	II	III	IV	I	II	III	IV	
Locally measured air temp.	x	x	x	x	x	x	x	x	x	x	x	x	
Locally measured wind					x	x	x	x					gaps in May and Aug; Sep was missing completely
Reanalysis data	x	x	x	x	x	x	x	x	x	x	x	x	
Thermistor data									x	x	x	x	thermistors were deployed end of Oct 2015, many loggers were lost
Simulation									x	x	x	x	simulation start was 1 st of Nov 2015

Table S3. Model fit for a linear regression between observed and simulated water temperatures (surface and bottom) per station. Results were significant (p-value: < 0.001), except for two stations: G, surface and F, bottom (grey in the table).

	station	intercept	slope	r^2	NSE	RMSE	MAE	n
surface	A	-0.46	0.97	0.965	0.948	1.38	1.89	12141
	B	-1.32	1.05	0.954	0.936	1.43	2.06	11084
	D	-1.57	1.06	0.951	0.929	1.51	2.29	11084
	F	0.34	0.98	0.830	0.801	1.65	2.73	7388
	G	-3.27	1.20	0.960	0.826	1.21	1.45	1967
	H	-1.63	1.08	0.951	0.920	1.16	1.36	7534
	I	-1.98	1.12	0.961	0.911	0.86	0.74	1967
	J	-2.76	1.07	0.920	0.819	2.37	5.63	11055
	L	-2.33	1.09	0.962	0.931	1.59	2.51	7321
bottom	A	-0.99	1.02	0.975	0.961	1.29	1.66	14109
	B	-0.49	0.97	0.973	0.953	1.29	1.67	13916
	D	-1.31	1.03	0.959	0.929	1.46	2.13	11084
	F	0.00	0.96	0.943	0.922	1.29	1.66	9355

G	2.96	0.78	0.934	-0.709	2.41	5.83	1535
H	-0.84	0.96	0.994	0.927	1.62	2.61	5327
I	-2.15	1.12	0.974	0.906	0.88	0.77	1967
J	-3.04	1.08	0.901	0.774	2.53	6.40	11055
L	-2.00	1.04	0.970	0.915	1.72	2.94	7321

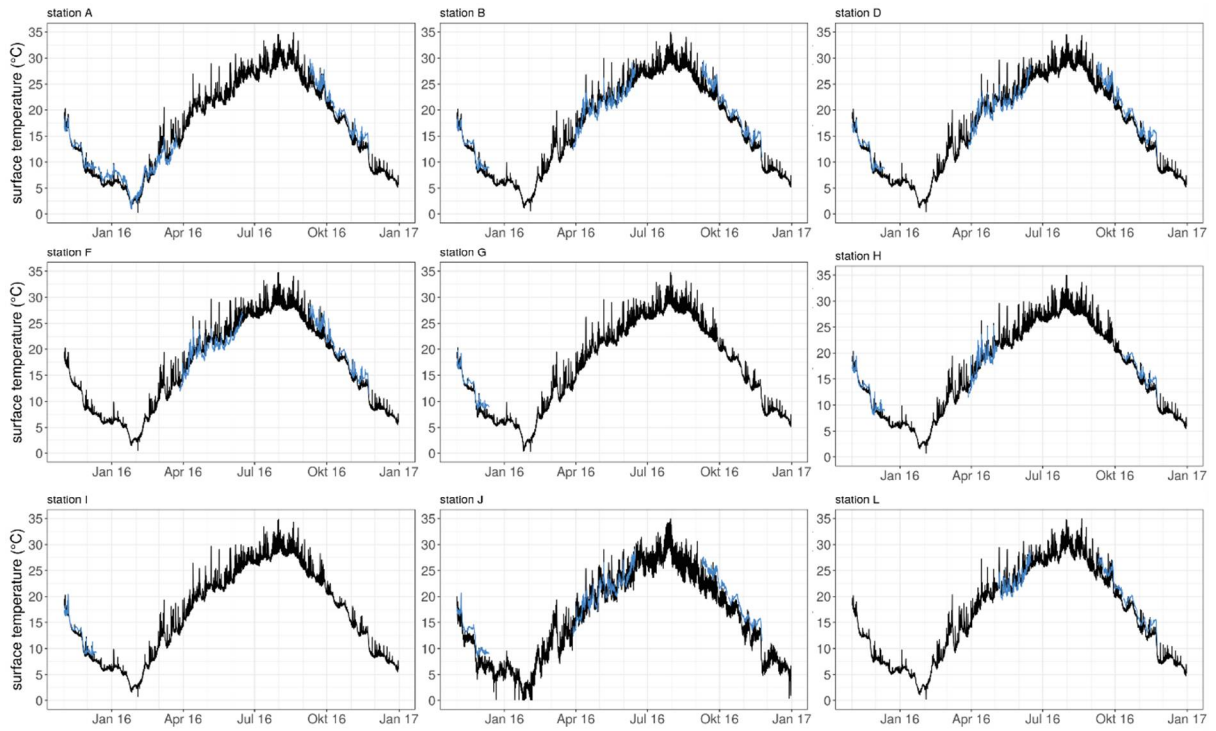


Figure S2. Water temperature at the surface. Blue: observations, black: simulation

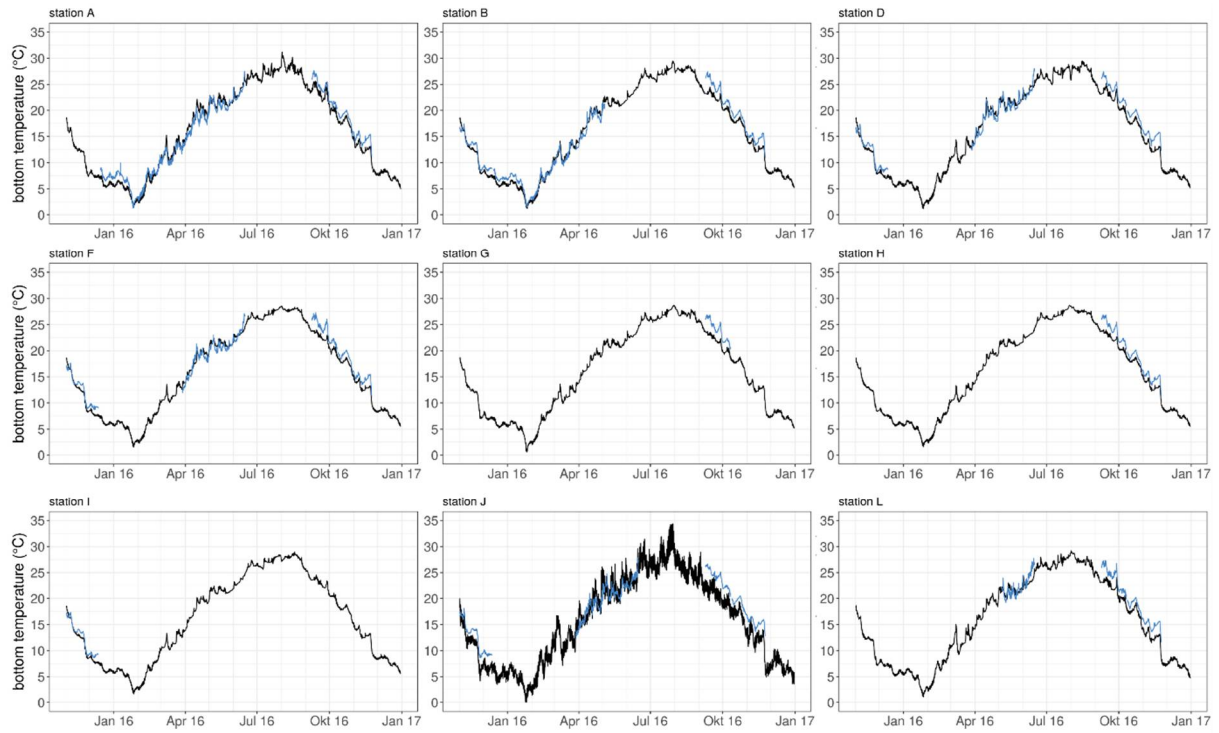


Figure S3. Water temperature at the bottom. Blue: observations, black: simulation.