

Supplementary data

**Effects of long-term increases in water temperature and stratification on
large artificial water-source lakes in South Korea**

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Table S1. Studied lake dimensions.

Lake	Watershed area (km ²)	Storage area (km ²)	Total storage volume (million ton)	Annual water supply plan (million ton)
Soyang (SY)	2,703	70	2,900	1,213
Paldang (PD)	23,800	36.5	244	880
Chungju (CJ)	6,648	97	2,750	3,380
Daecheong (DC)	3,204	72.4	1,490	1,649

Table S2. Study site locations and monitoring frequencies.

Lake (abbrev.)	Max. depth	Location		Monitoring frequency	
		Longitude	Latitude	Monthly	Weekly
Soyang (SY)	100	127°49'16.05"	37°56'40.92"	1993-	
Paldang (PD)	20	127°17'17.02"	37°31'17.02"	1993-2003	2004
Chungju (CJ)	71	127°59'47.39"	37°00'02.52"	1993-2003	2004
Daecheong (DC)	46	127°29'05.04"	36°28'37.00"	1993-2003	

Table S3. Seasonal air temperature trends according to the Mann-Kendall test

Site	Season	1973-2019		1993-2019	
		S	slope	S	slope
SY	Spring	3.84×10 ²	0.033**	112	0.059*
	Summer	4.05×10 ²	0.035***	140	0.067**
	Fall	3.96×10 ²	0.036***	114	0.046*
	Winter	1.32×10 ²	0.02	-5	0
PD	Spring	5.25×10 ²	0.050***	125	0.067**
	Summer	4.23×10 ²	0.037***	158	0.068**
	Fall	4.88×10 ²	0.058***	123	0.059*
	Winter	3.51×10 ²	0.056*	50	0.033
CJ	Spring	3.58×10 ²	0.032**	121	0.060*
	Summer	2.51×10 ²	0.024*	150	0.075**
	Fall	382	0.041***	117	0.055*
	Winter	2.26×10 ²	0.035*	40	0.027
DC	Spring	5.05×10 ²	0.045***	105	0.053*
	Summer	3.30×10 ²	0.029**	94	0.057*
	Fall	4.34×10 ²	0.046***	76	0.033*
	Winter	2.83×10 ²	0.045**	4	0.006

p-value: * < 0.05; ** < 0.01, *** < 0.001