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A 1985–2023 time series dataset of absolute reservoir storage in Mainland Southeast Asia (MSEA-Res)

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Figures

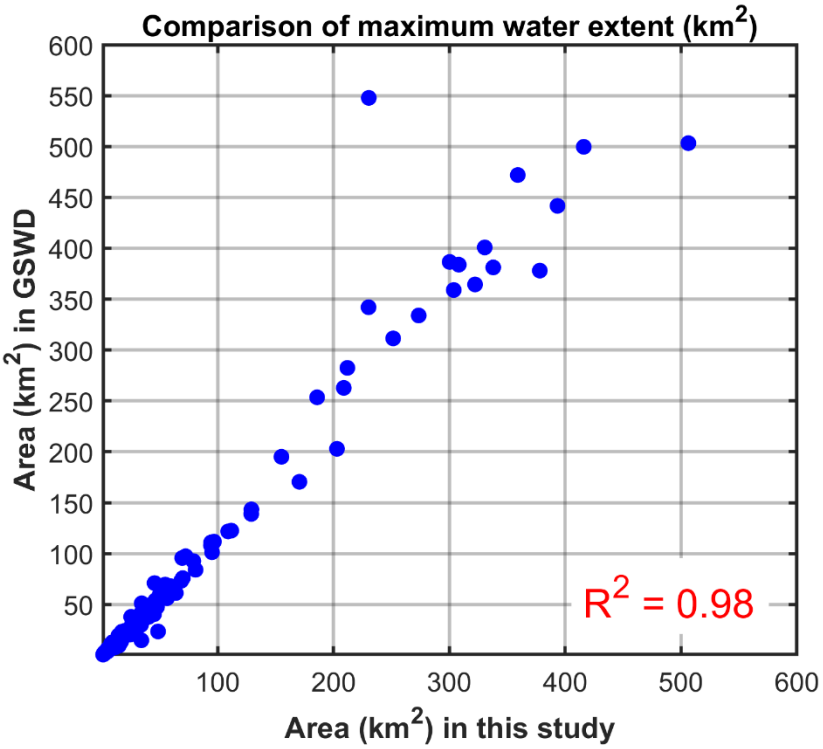

Figure S1. Comparison of maximum water extent with Global Surface Water Dataset (GSWD) for 186 reservoirs across Mainland Southeast Asia.

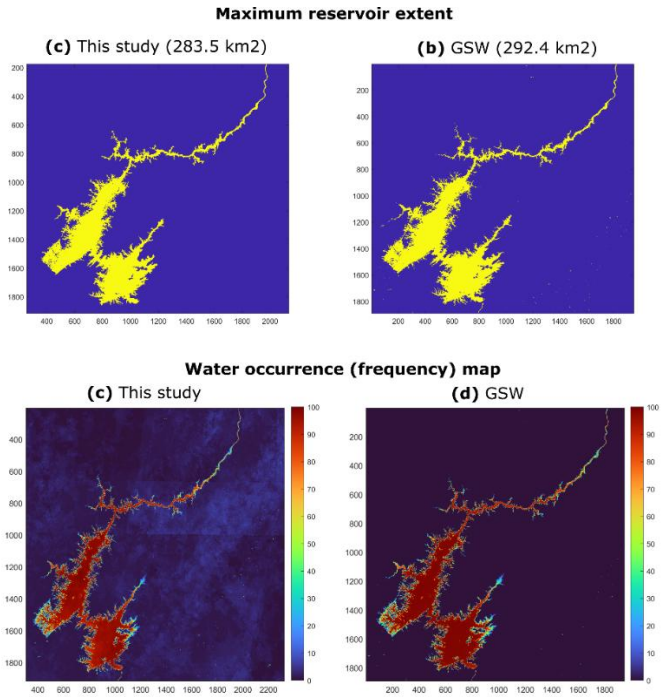

Figure S2. Comparison of maximum water extent and frequency maps with Global Surface Water Dataset (GSWD) for Sirikit reservoir.

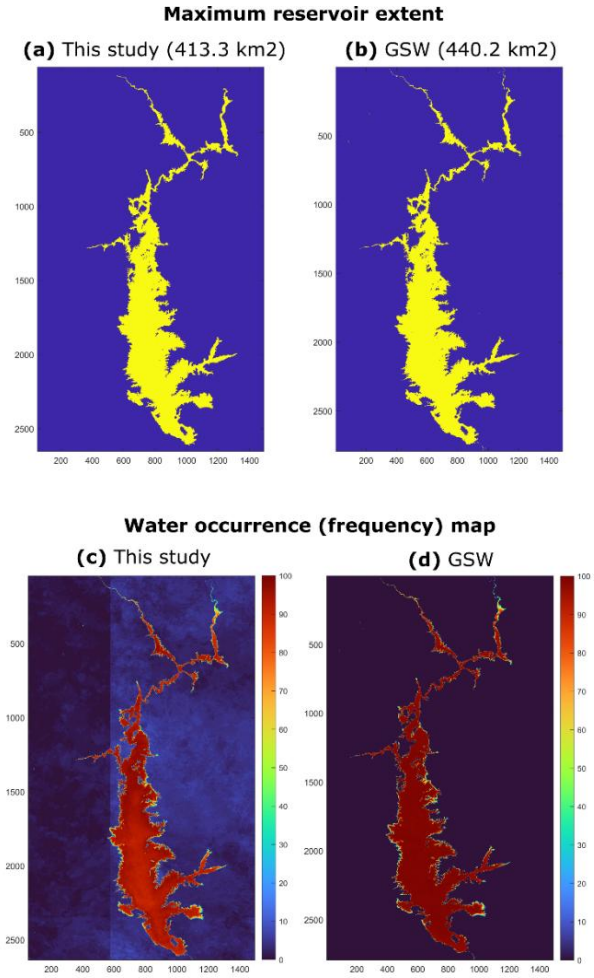

Figure S3. Comparison of maximum water extent and frequency maps with Global Surface Water Dataset (GSWD) for Srinagarind reservoir.

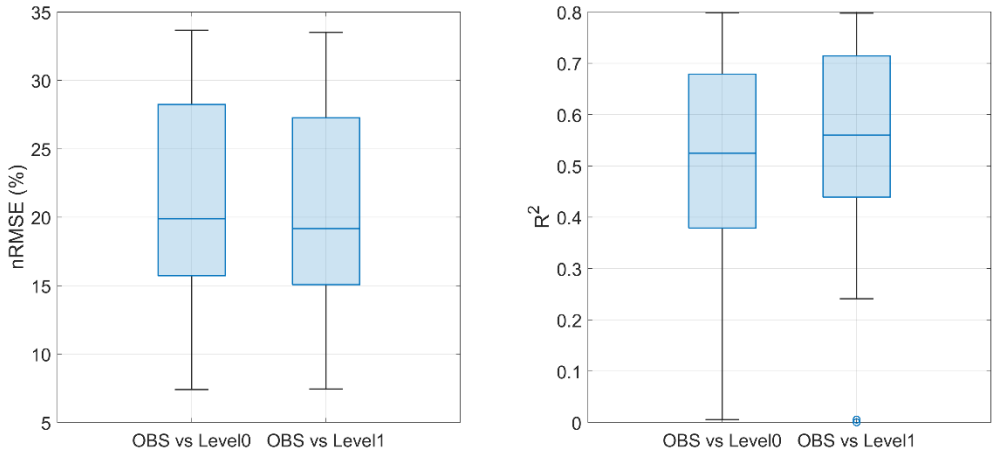

Figure S4: nRMSE and R2 between inferred (Level-0 and Level-1) and observed data. The nRMSE decreased and R^2 increased from Level-0 to Level-1, suggesting an improvement in the outlier removal approach.

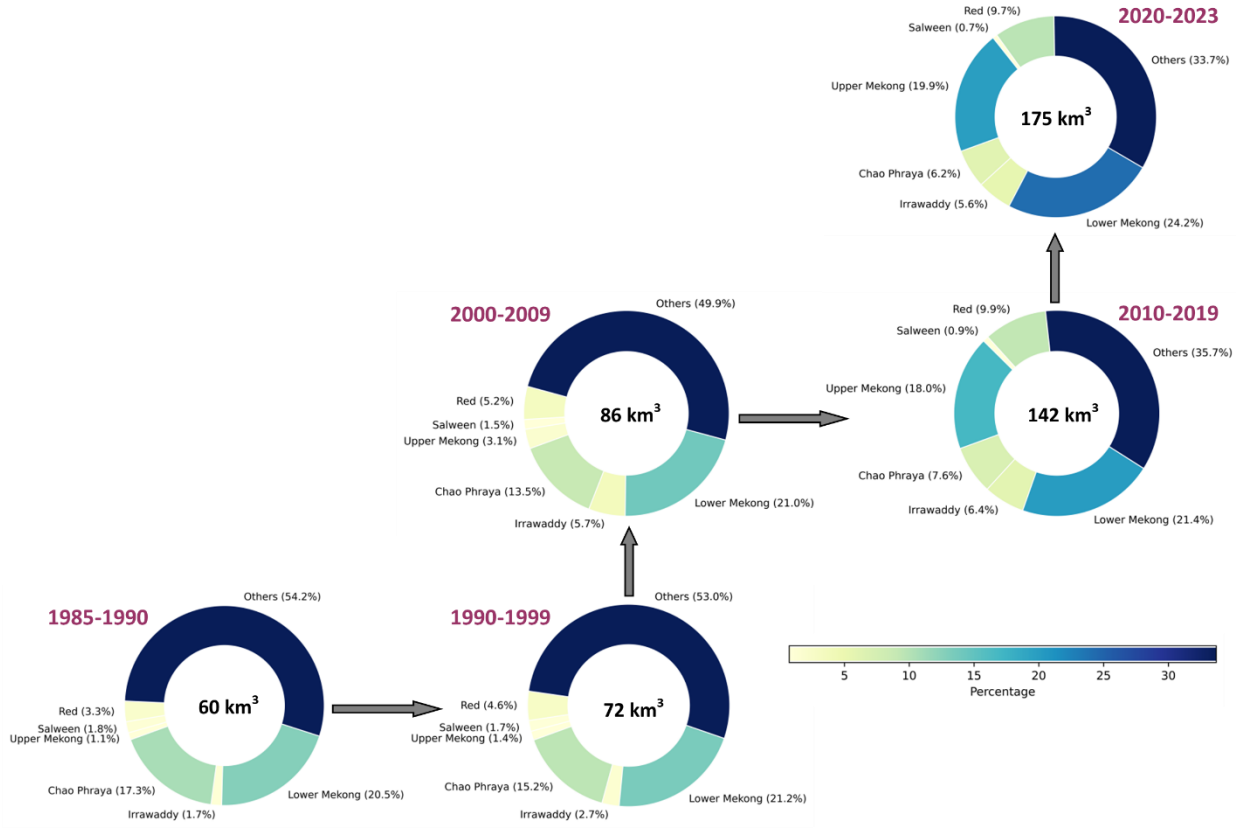

Figure S5: Change in total reservoir storage in Mainland Southeast Asia between 1985 and 2023. The value at the center of each pie-chart shows the average reservoir storage in that period, while the color division represents the percentage contribution of reservoir storage from each major basin.

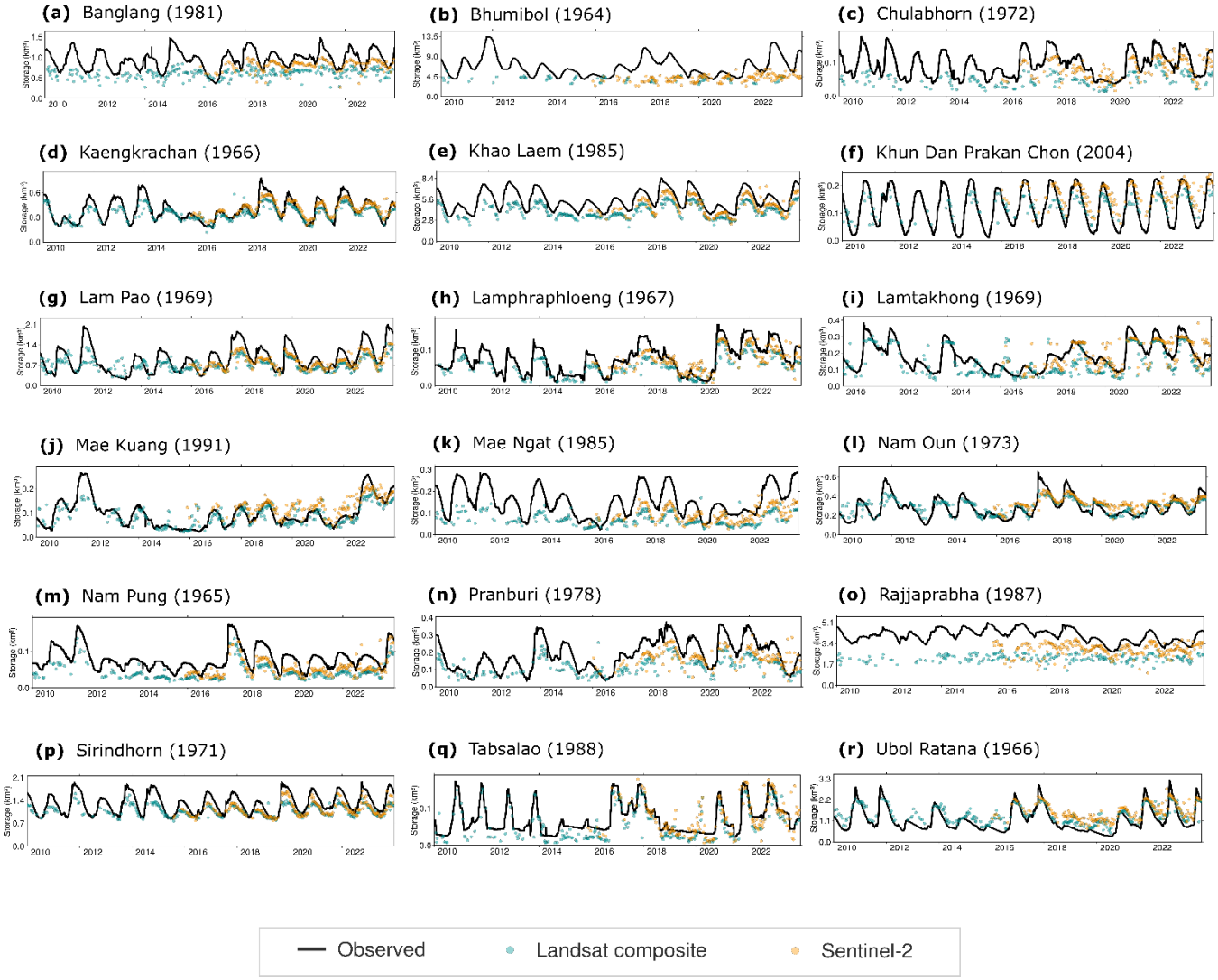

Figure S6: Direct validation of the storage time series against observed storage for eighteen different reservoirs in Thailand. All reservoirs were built before 2000, with the exception of Khun Dan Prakan Chao.

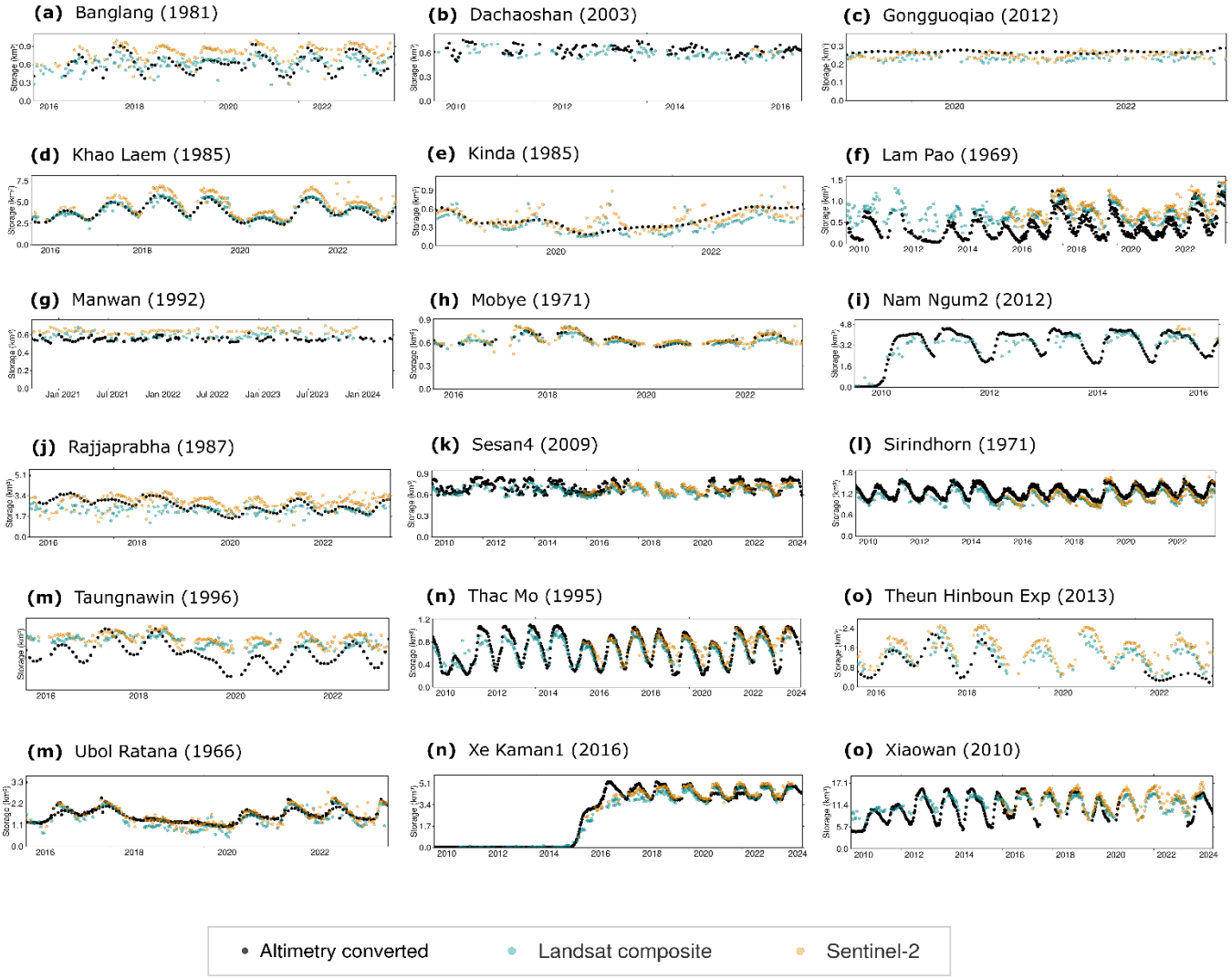

Figure S7: Indirect validation of the storage time-series against altimetry-converted storage for eighteen different reservoirs across Mainland Southeast Asia.

Tables

Table S1. List of reservoirs used in the direct validation and corresponding validation performance. Note that the reservoirs are listed in decreasing order of R^2.

Name of the reservoir	Year of commission	Longitude	Latitude	R^2	nRMSE (%)
Sirindhorn	1971	105.389	15.133	0.88	14.36
Srinagarind	1978	99.0648	14.5122	0.8	7.43
Ubol_Ratana	1966	102.587	16.758	0.8	13.15
Sirikit	1974	100.5286	17.8078	0.79	9.59
Lamphraphloeng	1967	101.785	14.537	0.78	16.67
Khao_Laem	1985	98.52	14.8817	0.77	18.19
Nam_Pung	1965	103.966	16.969	0.77	20.75
Kaengkrachan	1966	99.6114	12.9032	0.75	9.87
Tabsalao	1988	99.433	15.541	0.71	16.1
Lam_Pao	1969	103.44	16.654	0.7	16.91
Nam_Oun	1973	103.7467	17.2971	0.65	10.31
Mae_Kuang	1991	99.1204	18.9294	0.59	13.16
Lamtakhong	1969	101.535	14.821	0.58	16.4
Mae_Ngat	1985	99.0382	19.1685	0.56	33.5
Khun_Dan_Prakan_Chon	2004	101.3241	14.3071	0.53	20.19
Pranburi	1978	99.7833	12.4615	0.48	25.82
Chulabhorn	1972	101.636	16.539	0.4	27.49
Bang_Lang	1981	101.271	6.146	0.24	24.59
Rajjaprabha	1987	98.7664	9.004	0.01	31.69
Bhumibol	1964	98.9024	17.2569	0	27.52

Table S2. List of reservoirs used in the indirect validation and corresponding validation performance. Note that the reservoirs are listed in decreasing order of R^2.

Name of the reservoir	Year of commission	Longitude	Latitude	R^2	nRMSE (%)
Xe_Kaman1	2016	107.174	14.97	0.97	6.43
Nuozhadu	2014	100.37	22.676	0.96	6.43
Theun_Hinboun_Exp	2013	104.66	18.315	0.95	20.54
Khao_Laem	1985	98.52	14.8817	0.93	8.02
Ubol_Ratana	1966	102.587	16.758	0.92	5.3
Sirindhorn	1971	105.389	15.133	0.89	11.07
Mobye	1971	97.0434	19.8716	0.87	4.66
Thac_Mo	1995	107.0624	11.8406	0.79	11.31
Lam_Pao	1969	103.44	16.654	0.78	24.26
Xiaowan	2010	99.95	24.745	0.71	14.36
Sesan4	2009	107.5064	13.975	0.7	8.04
Sirikit	1974	100.5286	17.8078	0.68	17.69
Taungnawin	1996	95.5858	18.9231	0.58	29.07
Dachaoshan	2003	100.505	24.128	0.49	10.53
Gongguoqiao	2012	99.331	25.589	0.47	15.92
Kinda	1985	96.3113	21.1581	0.35	18.39
Bang_Lang	1981	101.271	6.146	0.28	16.61
Nam_Ngum2	2012	102.797	18.846	0.12	10.58
Rajjaprabha	1987	98.7664	9.004	0.1	16
Manwan	1992	100.42	24.659	0	12.05