



Figure S1. Outflow of Jin'anqiao reservoir simulated by linear regression in non-flood season (2016 – 2017)

Table S1. Results of fitting the reservoir outflow based on dispatch function.

Reservoir	Accuracy	Flood season		Non-flood season	
		Calibration	Validation	Calibration	Validation
Ertan	<i>NSE</i>	0.89	0.92	0.77	0.84
	<i>R</i> ²	0.89	0.92	0.77	0.85
	<i>PBIAS</i> (%)	0	−0.73	0	−2.69
Jinping I	<i>NSE</i>	0.86	0.91	0.95	0.86
	<i>R</i> ²	0.86	0.92	0.95	0.87
	<i>PBIAS</i> (%)	0	2.22	0	0.16
Liyuan	<i>NSE</i>	0.98	0.98	0.83	0.81
	<i>R</i> ²	0.98	0.98	0.83	0.81
	<i>PBIAS</i> (%)	0.00	−0.12	0.00	0.37
Jin'anqiao	<i>NSE</i>	0.96	0.90	0.76	0.51
	<i>R</i> ²	0.96	0.91	0.76	0.53
	<i>PBIAS</i> (%)	0.00	4.61	0.00	3.18
Guanyinyan	<i>NSE</i>	0.92	0.95	0.83	0.80
	<i>R</i> ²	0.92	0.95	0.83	0.80
	<i>PBIAS</i> (%)	0.00	0.25	0.00	−2.25
Xiluodu	<i>NSE</i>	0.89	0.93	0.81	0.82
	<i>R</i> ²	0.89	0.93	0.81	0.83
	<i>PBIAS</i> (%)	0.00	2.75	0.00	−0.74

Xiangjiaba	<i>NSE</i>	0.94	0.95	0.91	0.88
	<i>R</i> ²	0.94	0.97	0.91	0.90
	<i>PBIAS</i> (%)	0.00	−4.90	0.00	−3.08

Table S2. Simulation accuracy of different reservoir algorithms for inflow and outflow of seven reservoirs in the Jinsha River basin

Simulation performance		Target storage capacity method			Without considering the reservoir influence			Dispatch function method		
		<i>NSE</i>	<i>R</i> ²	<i>PBIAS</i> (%)	<i>NSE</i>	<i>R</i> ²	<i>PBIAS</i> (%)	<i>NSE</i>	<i>R</i> ²	<i>PBIAS</i> (%)
Jinping I	inflow	0.73	0.79	−3.5	0.73	0.79	−3.5	0.73	0.79	−3.5
	outflow	−2.04	0.24	−7.0	−0.21	0.45	−8.6	0.45	0.58	−7.9
Ertan	inflow	0.09	0.47	0.1	0.54	0.64	−2.1	0.71	0.72	0.2
	outflow	−0.78	0.24	−3.2	0.52	0.58	−5.4	0.67	0.68	−3.1
Liyuan	inflow	0.82	0.88	−5.7	0.82	0.88	−5.7	0.82	0.88	−5.7
	outflow	0.69	0.81	−5.8	0.81	0.88	−5.7	0.82	0.88	−5.8
Jin'anqiao	inflow	0.82	0.85	−7.9	0.83	0.86	−8.2	0.83	0.86	−7.9
	outflow	0.66	0.74	−9.2	0.82	0.85	−9.6	0.82	0.85	−9.3
Guanyin yan	inflow	0.66	0.81	−24.8	0.68	0.82	−25.2	0.67	0.82	−25
	outflow	0.52	0.74	−18.7	0.65	0.80	−19.3	0.66	0.80	−18.8
Xiluodu	inflow	0.57	0.75	−1.8	0.77	0.85	−2.2	0.86	0.89	−1.0
	outflow	0.04	0.57	−14.6	0.47	0.72	−2.4	0.72	0.77	−1.7
Xiangjia ba	inflow	0.13	0.56	−10.6	0.62	0.75	−13.7	0.76	0.79	−11.0
	outflow	0.18	0.60	0.6	0.60	0.75	−1.9	0.71	0.75	0.6

Table S3. Typical GCMs under two RCPs and their spatial Resolution

Climate models	RCP4.5		RCP8.5	
	Typical GCMs	Spatial Resolution	Typical GCMs	Spatial Resolution
Cold-dry	IPSL-CM5B-LR	3.75°×1.90°	CSIRO-Mk3-6-0	1.875°×1.875°
Cold-wet	GFDL-ESM2M	2.5°×2.0°	CCSM4	1.25°×0.94°
Warm-dry	CMCC-CM	0.75°×0.75°	CSIRO-Mk3-6-0	1.875°×1.875°
Warm-wet	BNU-ESM	2.8°×2.8°	MIROC-ESM	2.8°×2.8°