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Modeling the potential impacts of climate change on the water table level of selected forested wetlands in the southeastern United States

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Supplementary Materials

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Table S1 Summary of the 20 CMIP5 GCMs used in this study from the downscaled MACA dataset.

No.	Model Name	Country	Model Institution	Atmosphere Grid in Degrees (lat x lon)
1	bcc-csm1-1	China	Beijing Climate Center, China Meteorological Administration	2.8 x 2.8
2	bcc-csm1-1-m	China	Beijing Climate Center, China Meteorological Administration	1.12 x 1.12
3	BNU-ESM	China	College of Global Change and Earth System Science, Beijing Normal University, China	2.8 x 2.8
4	CanESM2	Canada	Canadian Centre for Climate Modeling and Analysis	2.8 x 2.8
5	CCSM4	USA	National Center of Atmospheric Research, USA	1.25 x 0.94
6	CNRM-CM5	France	National Centre of Meteorological Research, France	1.4 x 1.4
7	CSIRO-Mk3-6-0	Australia	Commonwealth Scientific and Industrial Research Organization/Queensland Climate Change Centre of Excellence, Australia	1.8 x 1.8
8	GFDL-ESM2M	USA	NOAA Geophysical Fluid Dynamics Laboratory, USA	2.5 x 2.0
9	GFDL-ESM2G	USA	NOAA Geophysical Fluid Dynamics Laboratory, USA	2.5 x 2.0
10	HadGEM2-ES	United Kingdom	Met Office Hadley Center, UK	1.88 x 1.25
11	HadGEM2-CC	United Kingdom	Met Office Hadley Center, UK	1.88 x 1.25
12	inmcm4	Russia	Institute for Numerical Mathematics, Russia	2.0 x 1.5
13	IPSL-CM5A-LR	France	Institut Pierre Simon Laplace, France	3.75 x 1.8
14	IPSL-CM5A-MR	France	Institut Pierre Simon Laplace, France	2.5 x 1.25
15	IPSL-CM5B-LR	France	Institut Pierre Simon Laplace, France	2.75 x 1.8
16	MIROC5	Japan	Atmosphere and Ocean Research Institute (The University of Tokyo), National Institute for Environmental Studies,and Japan Agency for Marine-Earth Science and Technology	1.4 x 1.4
17	MIROC-ESM	Japan	Japan Agency for Marine-Earth Science and Technology, Atmosphere and Ocean Research Institute (The University of Tokyo), and National Institute for Environmental Studies	2.8 x 2.8
18	MIROC-ESM-CHEM	Japan	Japan Agency for Marine-Earth Science and Technology, Atmosphere and Ocean Research Institute (The University of Tokyo), and National Institute for Environmental Studies	2.8 x 2.8
19	MRI-CGCM3	Japan	Meteorological Research Institute, Japan	1.1 x 1.1
20	NorESM1-M	Norway	Norwegian Climate Center, Norway	2.5 x 1.9

Table S2 Annual changes of climate variables of 20 GCMs for WT, P-PET, P, PET, and AT in site AR.

Scenario	WT mean (cm/365d)	WT min (cm/365d)	P-PET (mm/365d)	P (mm/365d)	PET (mm/365d)	AT (Deg C/365d)
B	0	-1	290	1266	977	16.5
F1	-1	-3	233	1295	1062	18.1
F2	-1	-3	215	1322	1107	18.9
F3	-2	-3	199	1298	1100	18.8
F4	-4	-5	106	1303	1198	20.4
ΔF1B	-1	-2	-57	29	85	1.6
ΔF2B	-1	-2	-75	56	130	2.4
ΔF3B	-2	-2	-91	32	123	2.3
ΔF4B	-4	-4	-184	37	221	3.9

Note: B:1980-1999, historical baseline; F1:2040-2059, RCP 4.5, future scenario 1; F2:2080-2099, RCP 4.5, future scenario 2; F3:2040-2059, RCP 8.5, future scenario 3; F4:2080-2099, RCP 8.5, future scenario 4; Values of ΔFnB (n=1, 2, 3, 4) indicate the values of scenario Fn minus values of baseline scenario.

Table S2 Annual changes of climate variables of 20 GCMs for WT, P-PET, P, PET, and AT in site LP.

Scenario	WT mean (cm/365d)	WT min (cm/365d)	P-PET (mm/365d)	P (mm/365d)	PET (mm/365d)	AT (Deg C/365d)
B	-100	-110	313	1275	963	16.1
F1	-106	-116	263	1318	1055	17.9
F2	-107	-118	241	1343	1103	18.7
F3	-108	-118	231	1325	1093	18.5
F4	-119	-127	138	1338	120	20.4
ΔF1B	-6	-6	-50	43	92	1.8
ΔF2B	-7	-8	-72	68	140	2.6
ΔF3B	-8	-8	-82	50	130	2.4
ΔF4B	-19	-17	-175	63	238	4.3

Note: B:1980-1999, historical baseline; F1:2040-2059, RCP 4.5, future scenario 1; F2:2080-2099, RCP 4.5, future scenario 2; F3:2040-2059, RCP 8.5, future scenario 3; F4:2080-2099, RCP 8.5, future scenario 4; Values of ΔFnB (n=1, 2, 3, 4) indicate the values of scenario Fn minus values of baseline scenario.

Table S3 Annual changes of climate variables of 20 GCMs for WT, P-PET, P, PET, and AT in site SC.

Scenario	WT mean (cm/365d)	WT min (cm/365d)	P-PET (mm/365d)	P (mm/365d)	PET (mm/365d)	AT (Deg C/365d)
B	-16	-19	142	1192	1050	18.1
F1	-18	-22	67	1217	1150	19.8
F2	-18	-21	60	1262	1202	20.6
F3	-19	-22	49	1241	1192	20.5
F4	-23	-25	-65	1252	1316	22.4
B	-16	-19	142	1192	1050	18.1
ΔF2B	-2	-2	-82	70	152	2.5
ΔF3B	-3	-3	-93	49	142	2.5
ΔF4B	-7	-6	-207	60	266	4.3

Note: B:1980-1999, historical baseline; F1:2040-2059, RCP 4.5, future scenario 1; F2:2080-2099, RCP 4.5, future scenario 2; F3:2040-2059, RCP 8.5, future scenario 3; F4:2080-2099, RCP 8.5, future scenario 4; Values of ΔFnB (n=1, 2, 3, 4) indicate the values of scenario Fn minus values of baseline scenario.

Table S4 Annual changes of climate variables of 20 GCMs for WT, P-PET, P, PET, and AT in FL–UP.

Scenario	WT mean (cm/365d)	WT min (cm/365d)	P-PET (mm/365d)	P (mm/365d)	PET (mm/365d)	AT (Deg C/365d)
B	-73	-81	165	1318	1153	20.6
F1	-78	-88	83	1333	1250	22.2
F2	-78	-83	74	1376	1302	22.9
F3	-80	-88	46	1338	1292	22.8
F4	-90	-99	-124	1297	1420	24.6
ΔF1B	-5	-7	-82	15	97	1.6
ΔF2B	-5	-2	-91	58	149	2.3
ΔF3B	-7	-7	-119	20	139	2.2
ΔF4B	-17	-18	-289	-21	267	4.0

Note: B:1980-1999, historical baseline; F1:2040-2059, RCP 4.5, future scenario 1; F2:2080-2099, RCP 4.5, future scenario 2; F3:2040-2059, RCP 8.5, future scenario 3; F4:2080-2099, RCP 8.5, future scenario 4;

Values of ΔFnB (n=1, 2, 3, 4) indicate the values of scenario Fn minus values of baseline scenario.

Table S5 Annual changes in averages of future climate variables of 20 GCMs for WT, P-PET, P, PET, and AT in FL–WET.

Scenario	WT mean (cm/365d)	WT min (cm/365d)	P-PET (mm/365d)	P (mm/365d)	PET (mm/365d)	AT (Deg C/365d)
B	2	-6	165	1318	1153	20.6
F1	-4	-14	83	1333	1250	22.2
F2	-5	-10	74	1376	1302	22.9
F3	-7	-17	46	1338	1292	22.8
F4	-20	-30	-124	1297	1420	24.6
ΔF1B	-6	-8	-82	15	97	1.6
ΔF2B	-7	-4	-91	58	149	2.3
ΔF3B	-9	-11	-119	20	139	2.2
ΔF4B	-22	-24	-289	-21	267	4.0

Note: B:1980-1999, historical baseline; F1:2040-2059, RCP 4.5, future scenario 1; F2:2080-2099, RCP 4.5, future scenario 2; F3:2040-2059, RCP 8.5, future scenario 3; F4:2080-2099, RCP 8.5, future scenario 4;

Values of ΔFnB (n=1, 2, 3, 4) indicate the values of scenario Fn minus values of baseline scenario.

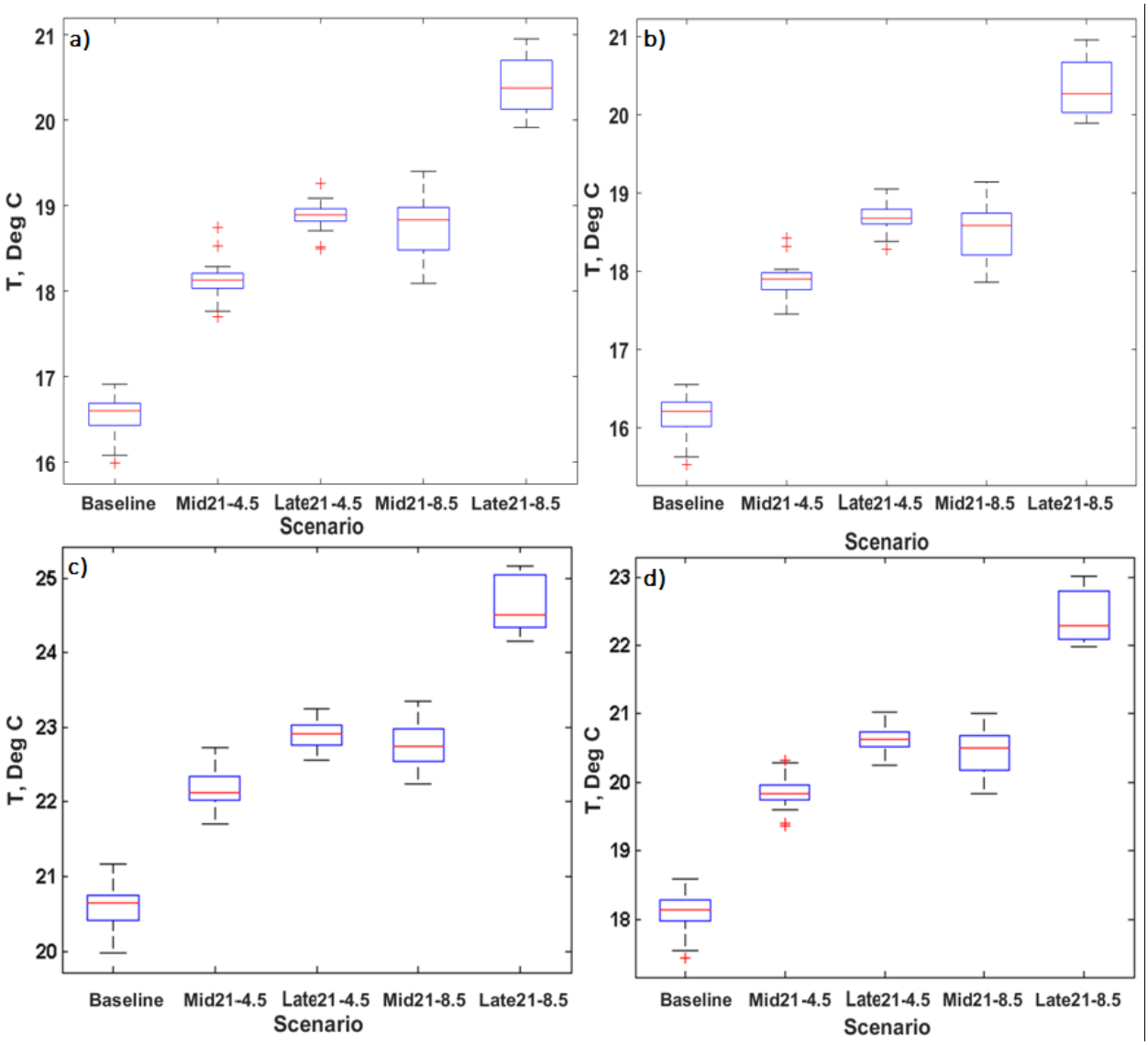

Fig. S1 Mean annual air temperature of 20 GCMs (unit: Deg C), where a) is site AR (Alligator River National Wildlife Refuge in North Carolina), b) is site LP (loblolly pine plantation in North Carolina), c) is site FL-UP (upland in Florida) and site FL-WET (wetland in Florida), and d) is site SC (wetland in South Carolina). Baseline is 1980–1999, historical run of GCMs; mid21 is 2040–2059, under RCPs 4.5 and 8.5 scenarios; late21 is 2080–2099, under RCPs 4.5 and 8.5 scenarios.

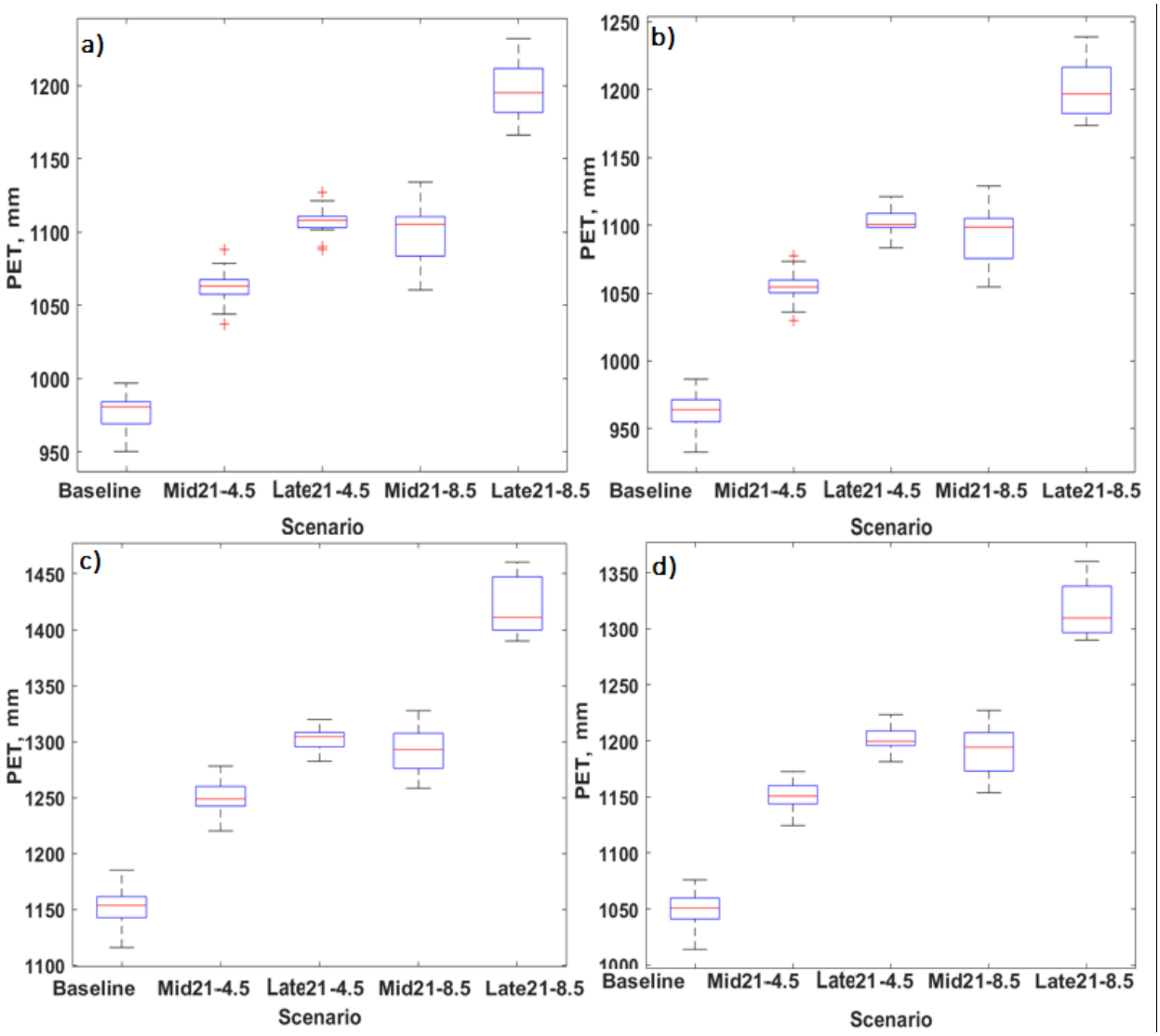

Fig. S2 Mean annual PET of 20 GCMs (unit: mm), where a) is site AR (Alligator River National Wildlife Refuge in North Carolina), b) is site LP (loblolly pine plantation in North Carolina), c) is site FL-UP (upland in Florida) and site FL-WET (wetland in Florida), and d) is site SC (wetland in South Carolina). Baseline is 1980–1999, historical run of GCMs; mid21 is 2040–2059, under RCPs 4.5 and 8.5 scenarios; late21 is 2080–2099, under RCPs 4.5 and 8.5 scenarios.

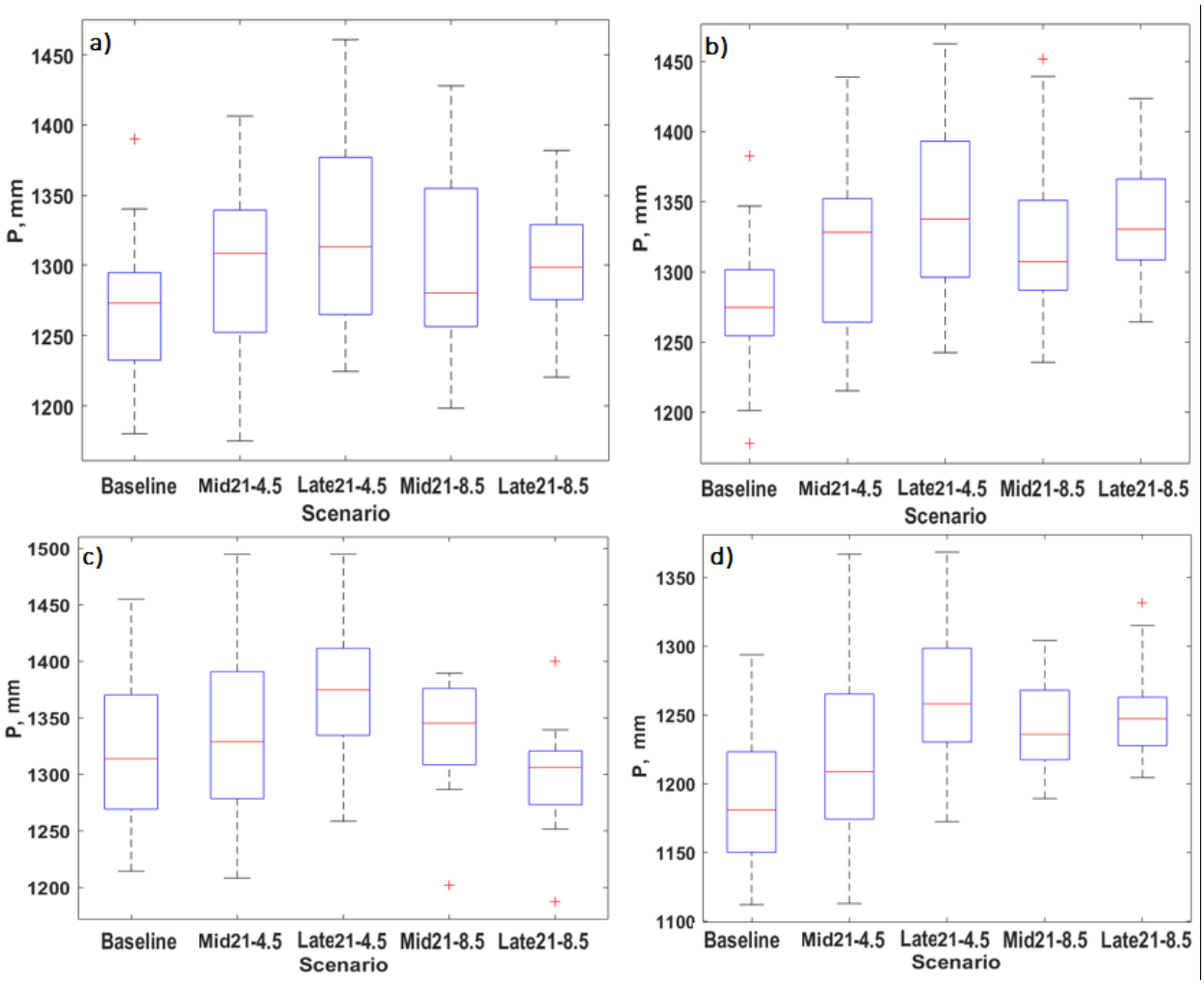

Fig. S3 Total annual precipitation of 20 GCMs (unit: mm), where a) is site AR (Alligator River National Wildlife Refuge in North Carolina), b) is site LP (loblolly pine plantation in North Carolina), c) is site FL-UP (upland in Florida) and site FL-WET (wetland in Florida), and d) is site SC (wetland in South Carolina). Baseline is 1980–1999, historical run of GCMs; mid21 is 2040–2059, under RCPs 4.5 and 8.5 scenarios; late21 is 2080–2099, under RCPs 4.5 and 8.5 scenarios.