Supplement of Hydrol. Earth Syst. Sci., 27, 3999–4018, 2023
https://doi.org/10.5194/hess-27-3999-2023-supplement

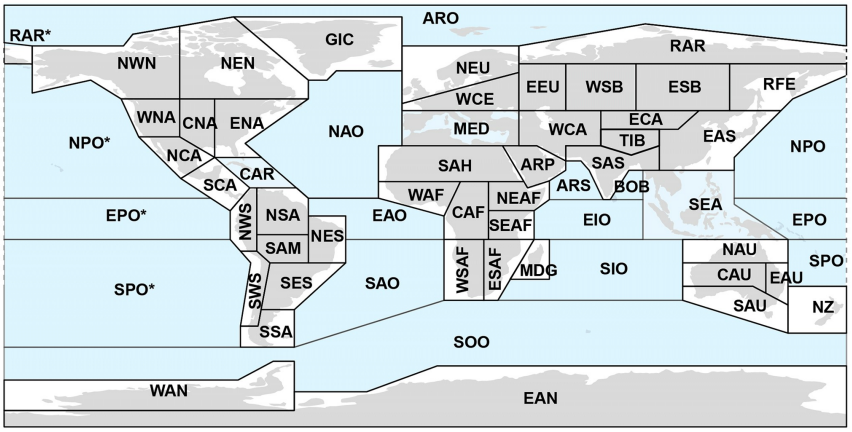
Hydrology and Earth System Sciences
Open Access
EGU

Supplement of

Root zone soil moisture in over 25 % of global land permanently beyond pre-industrial variability as early as 2050 without climate policy

En Ning Lai et al.

Correspondence to: Ruud J. van der Ent (r.j.vanderent@tudelft.nl)



1	GIC	Greenland/Iceland
2	NWN	N.W.North-America
3	NEN	N.E.North-America
4	WNA	W.North-America
5	CNA	C.North-America
6	ENA	E.North-America
7	NCA	N.Central-America
8	SCA	S.Central-America
9-10	CAR	Caribbean
11	NWS	N.W.South-America
12	NSA	N.South-America
13	NES	N.E.South-America
14	SAM	South-American-Monsoon
15	SWS	S.W.South-America
16	SES	S.E.South-America
17	SSA	S.South-America
18	NEU	N.Europe
19	WCE	Western&Central-Europe
20	EEU	E.Europe
21-22	MED	Mediterranean

23	SAH	Sahara
24	WAF	Western-Africa
25	CAF	Central-Africa
26	NEAF	N.Eastern-Africa
27	SEAF	S.Eastern-Africa
28	WSAF	W.Southern-Africa
29	ESAF	E.Southern-Africa
30	MDG	Madagascar
31	RAR	Russian-Arctic
32	WSB	W.Siberia
33	ESB	E.Siberia
34	RFE	Russian-Far-East
35	WCA	W.C.Asia
36	ECA	E.C.Asia
37	TIB	Tibetan-Plateau
38	EAS	E.Asia
39	ARP	Arabian-Peninsula
40	SAS	S.Asia
41-42	SEA	S.E.Asia

43	NAU	N.Australia
44	CAU	C.Australia
45	EAU	E.Australia
46	SAU	S.Australia
47	NZ	New-Zealand
48	EAN	E.Antarctica
49	WAN	W.Antarctica
50	ARO	Arctic-Ocean
51	NPO	N.Pacific-Ocean
52	EPO	Equatorial.Pacific-Ocean
53	SPO	S.Pacific-Ocean
54	NAO	N.Atlantic-Ocean
55	EAO	Equatorial.Atlantic-Ocean
56	SAO	S.Atlantic-Ocean
57	ARS	Arabian-Sea
58	BOB	Bay-of-Bengal
59	EIO	Equatorial.Indic-Ocean
60	SIO	S.Indic-Ocean
61	SOO	Southern-Ocean

Figure S1. Intergovernmental Panel on Climate Change Working Group I (IPCC WGI) climate reference regions (Iturbide et al., 2020).

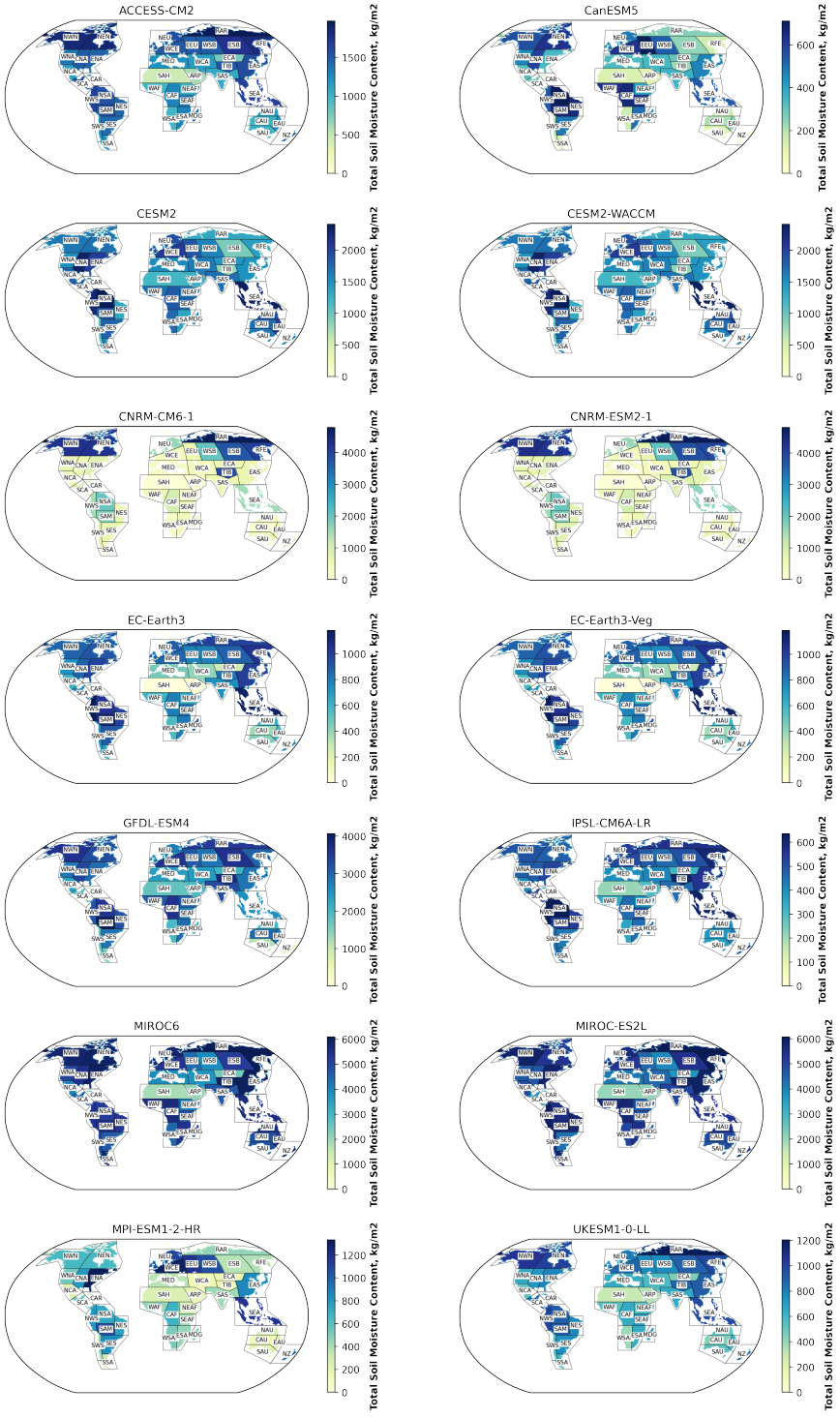


Figure S2. The maps show the 80-year average values of the regional monthly total soil moisture content from the PiControl scenario.

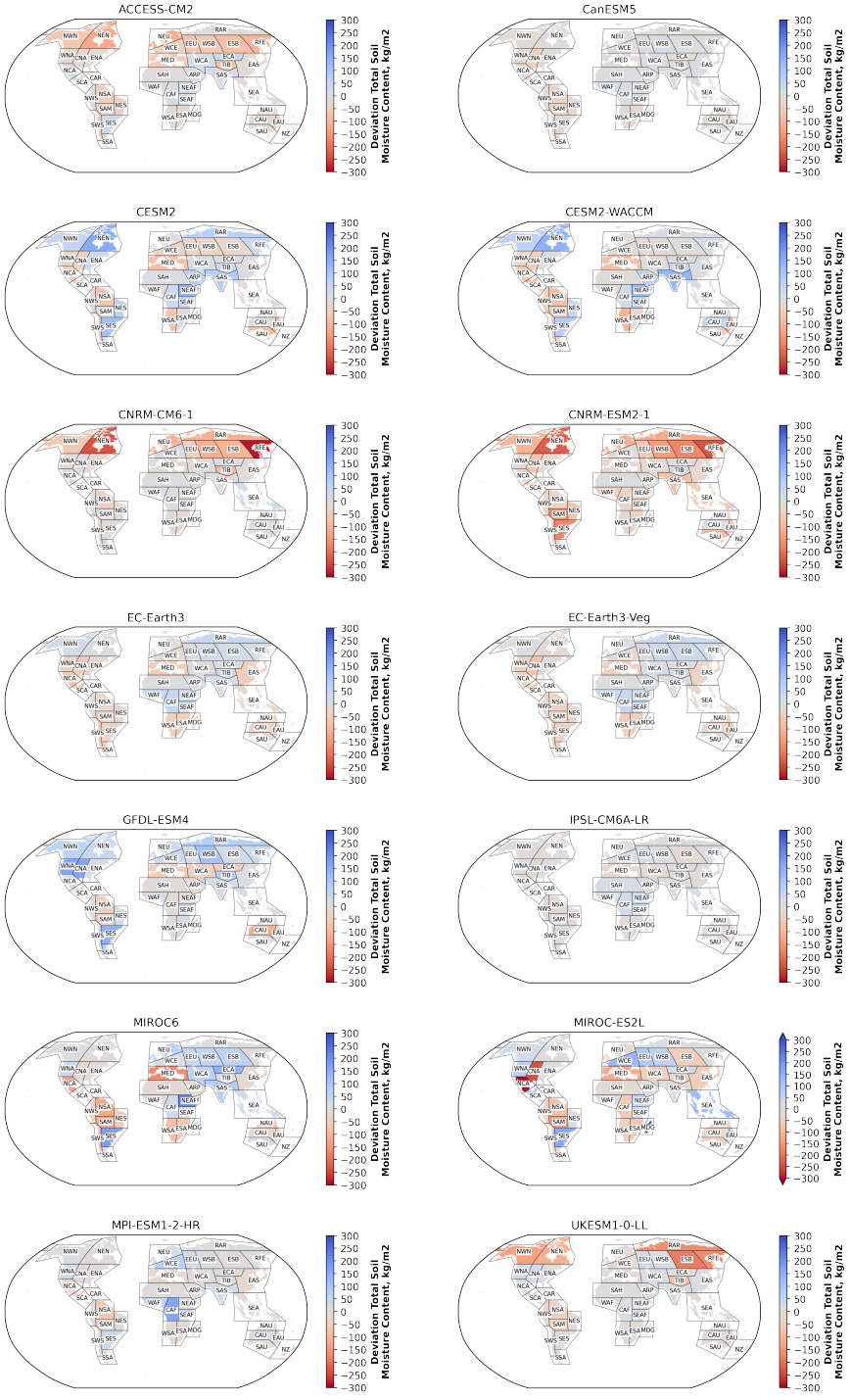


Figure S3. The deviation of the yearly mean total soil moisture content between 2071 and 2100 in SSP1-2.6 from the PiControl scenario for each Earth System Model (ESM). The regions with a lower soil moisture content than the PiControl baseline are in red while the regions with higher soil moisture are in blue.

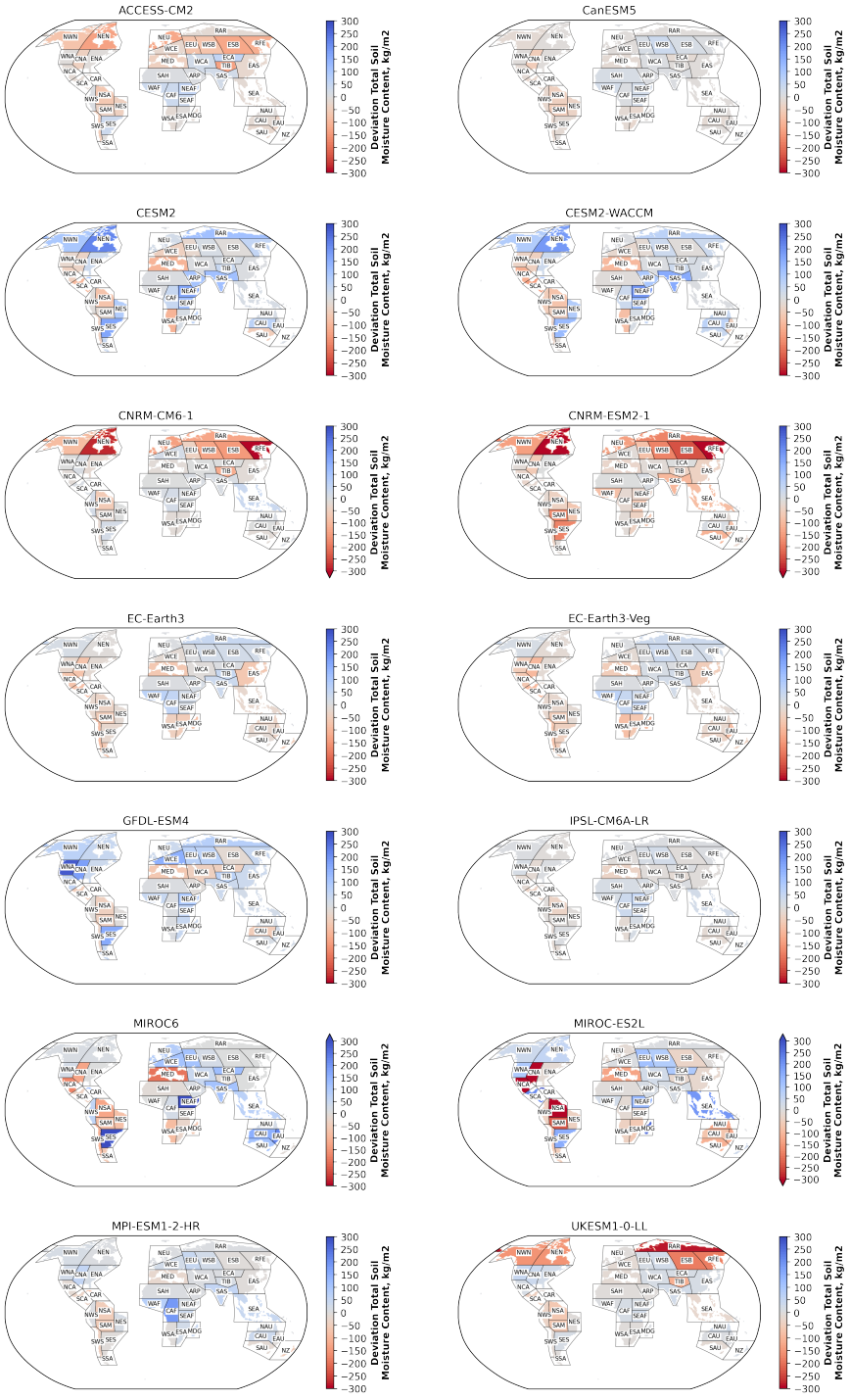


Figure S4. As in S3, but for the SSP2-4.5 scenario.

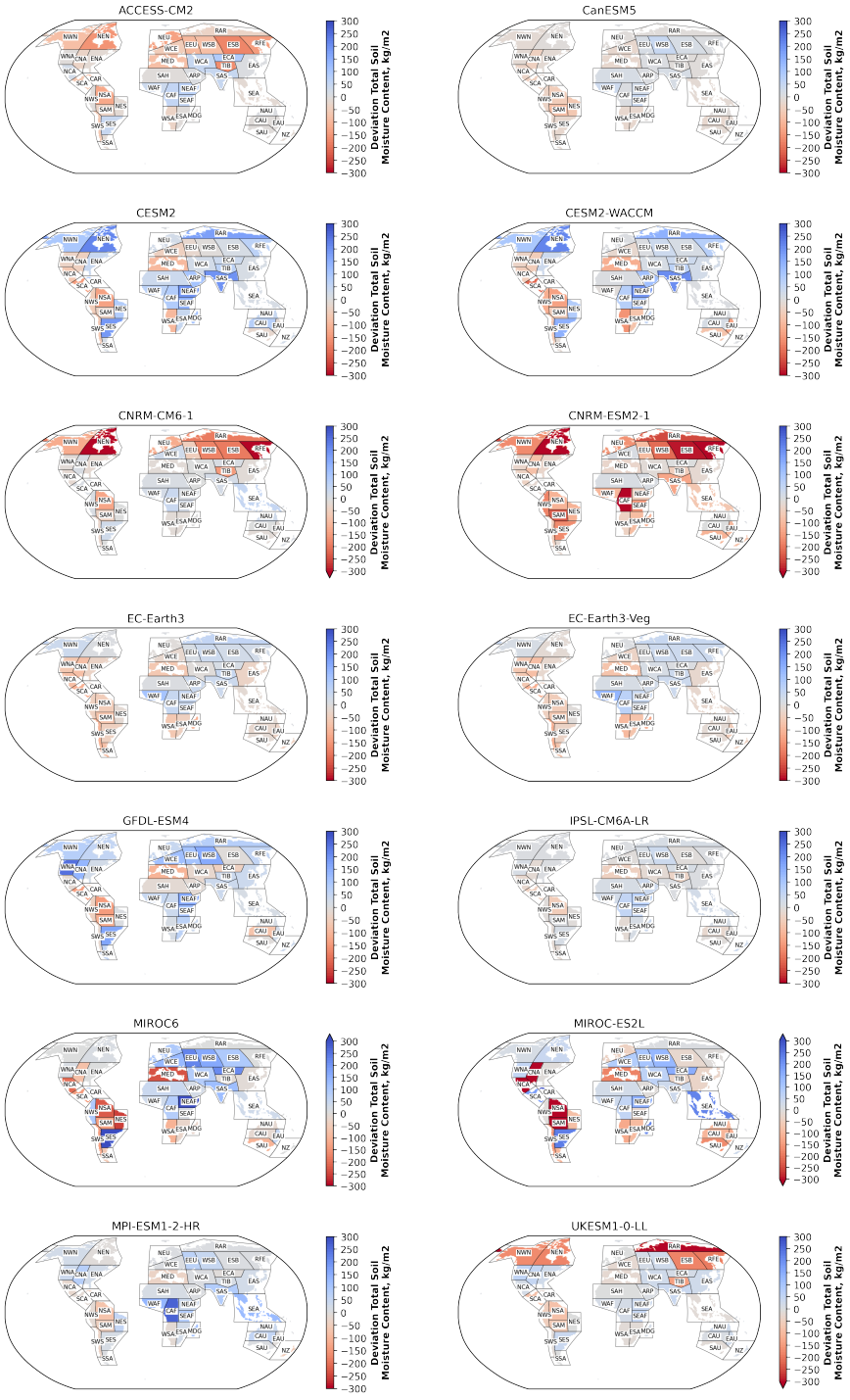


Figure S5. As in S3, but for the SSP3-7.0 scenario.

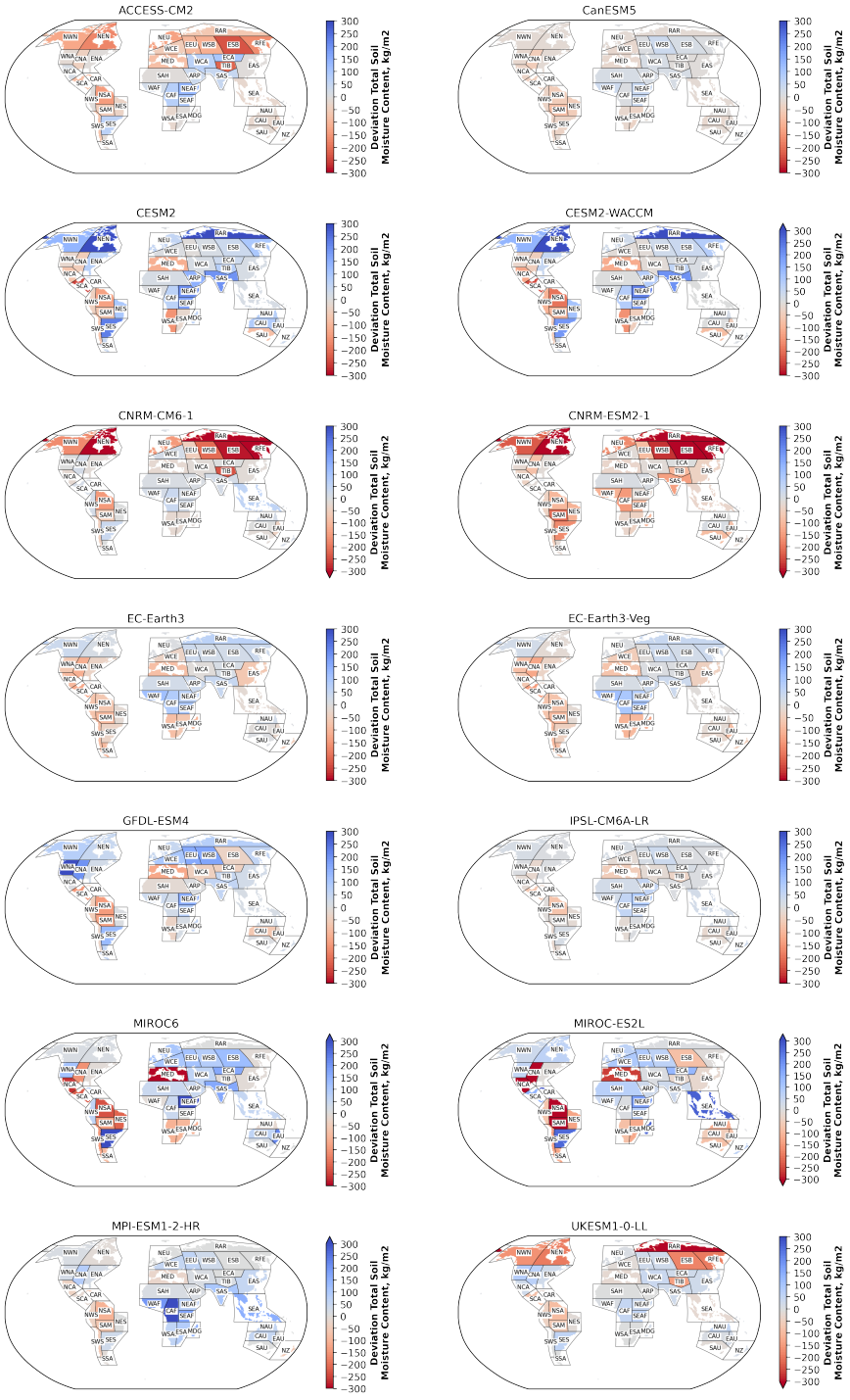


Figure S6. As in S3, but for the SSP5-8.5 scenario.

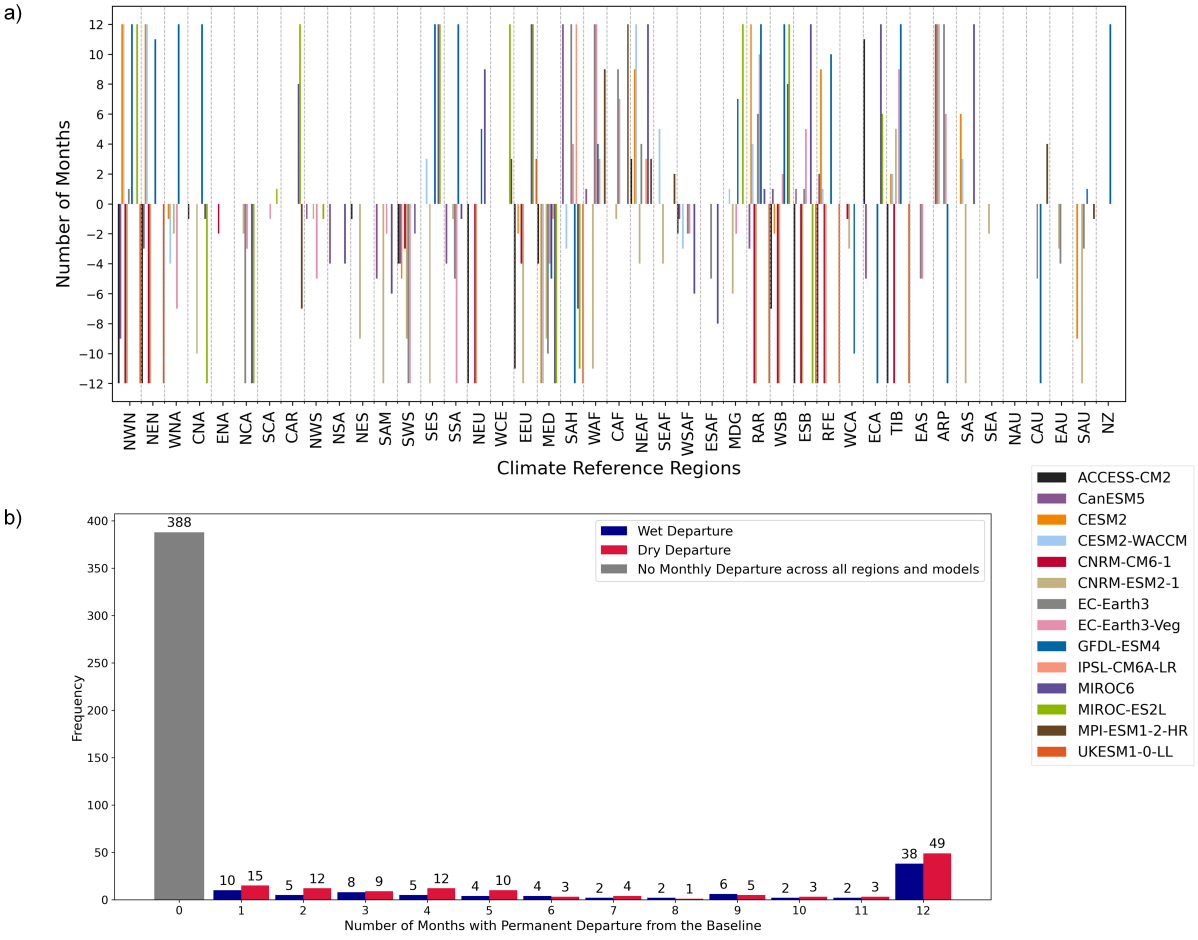


Figure S7. **(a)** For the SSP1-2.6 scenario: The number of months there is a permanent departure from the PiControl baseline variability for each of the climate reference regions (x-axis). The colors indicate the different climate models (legend on the lower-right corner). **(b)** Same data as in (a), but illustrating the frequency of the number of months with a permanent departure across each model and region. Zero indicates that a particular region in a model has no permanent departure at all.

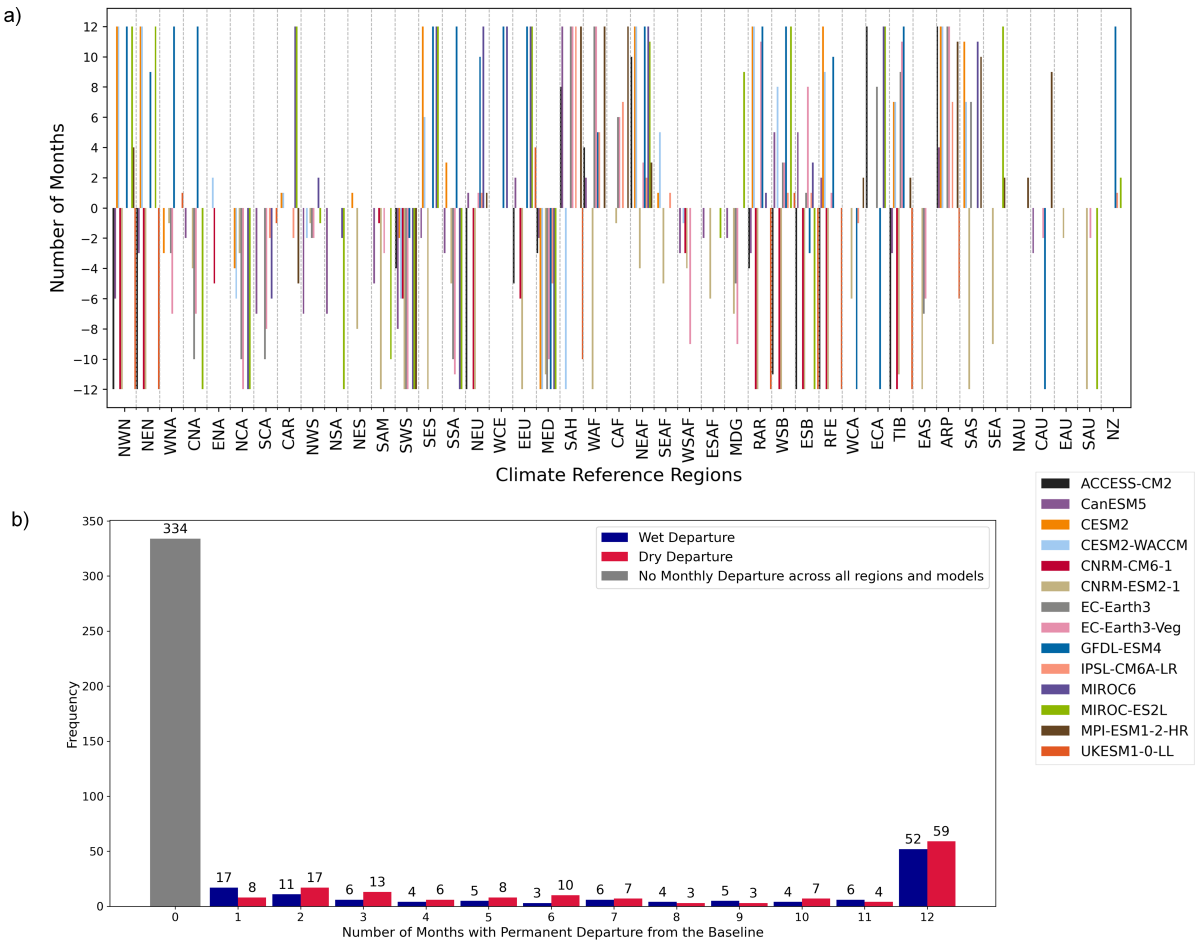


Figure S8. As in S7, but for the SSP2-4.5 scenario.

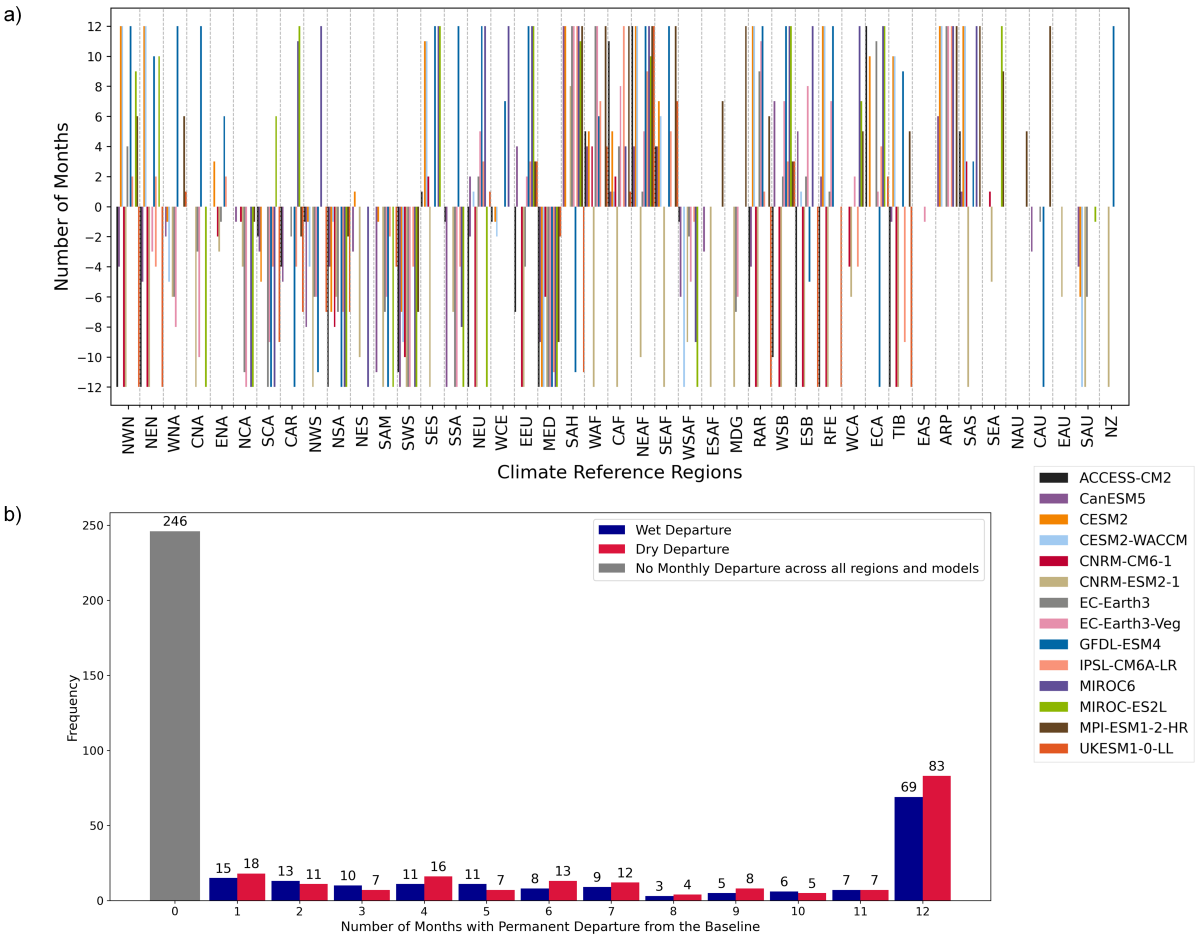


Figure S9. As in S7, but for the SSP3-7.0 scenario.

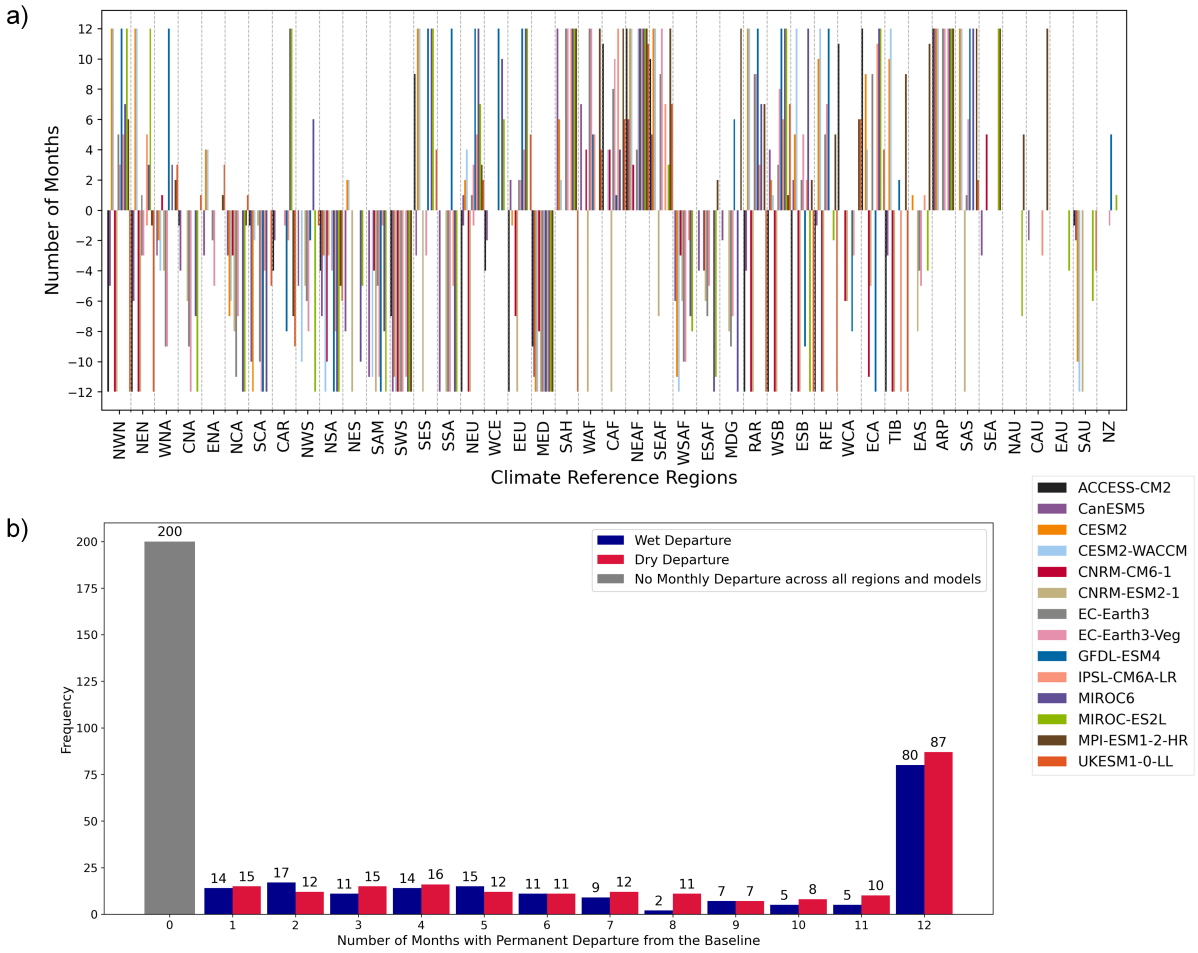


Figure S10. As in S7, but for the SSP5-8.5 scenario.

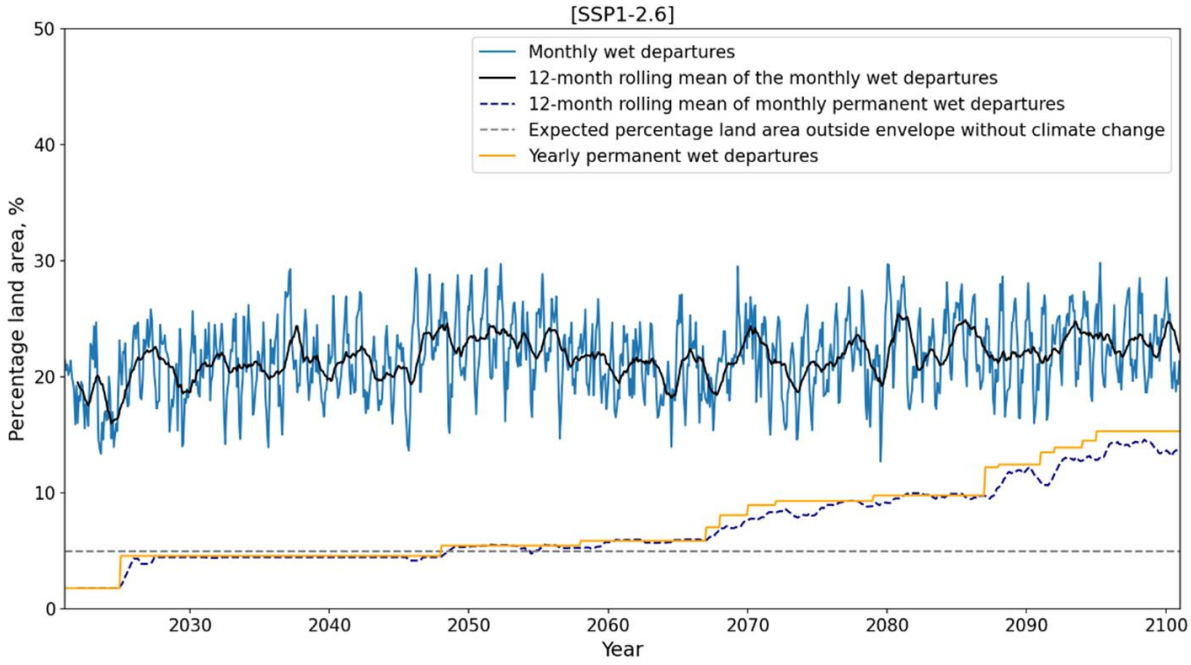


Figure S11. The changes in the percentage of the land area in each SSP1-2.6 with wet departure. The expected percentage (5 %) of land area outside the envelope (grey dotted line) is the land area that has higher total soil moisture content than the 95th percentile of the PiControl baseline even when climate was similar to pre-industrial conditions. The monthly wet departures are the land area where the monthly total soil moisture content exceeds the 95th percentile of the PiControl baseline. The 12-month rolling mean of monthly permanent wet departures is computed from the monthly wet departures that occur only after the time of emergence. The yearly permanent wet departure is the proportion of land area with a yearly total soil moisture content that exceeds the 95th percentile after the time of emergence. The graph is plotted with the ensemble medians.

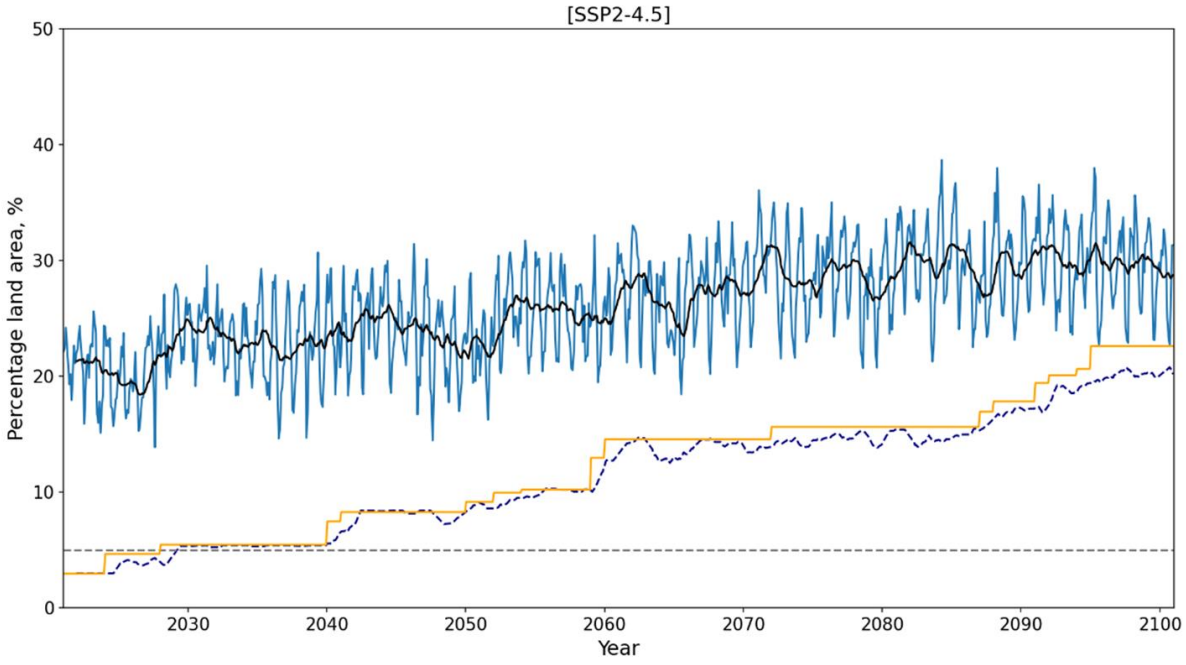


Figure S12. As in S11, but for the SSP2-4.5 scenario.

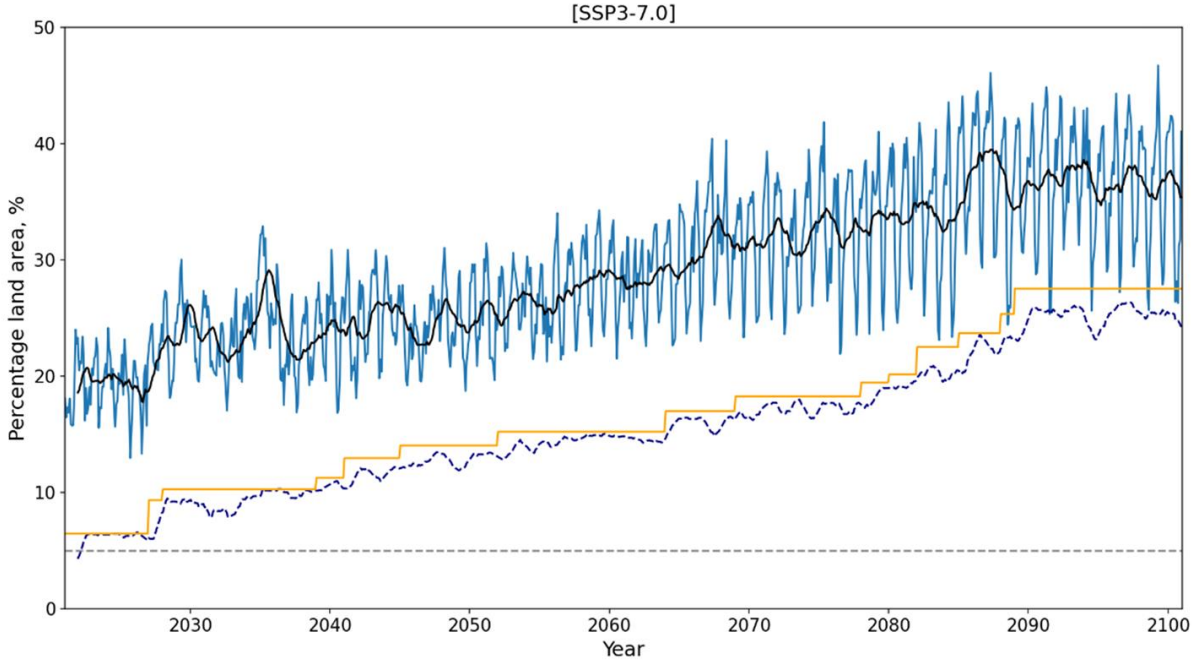


Figure S13. As in S11, but for the SSP3-7.0 scenario.

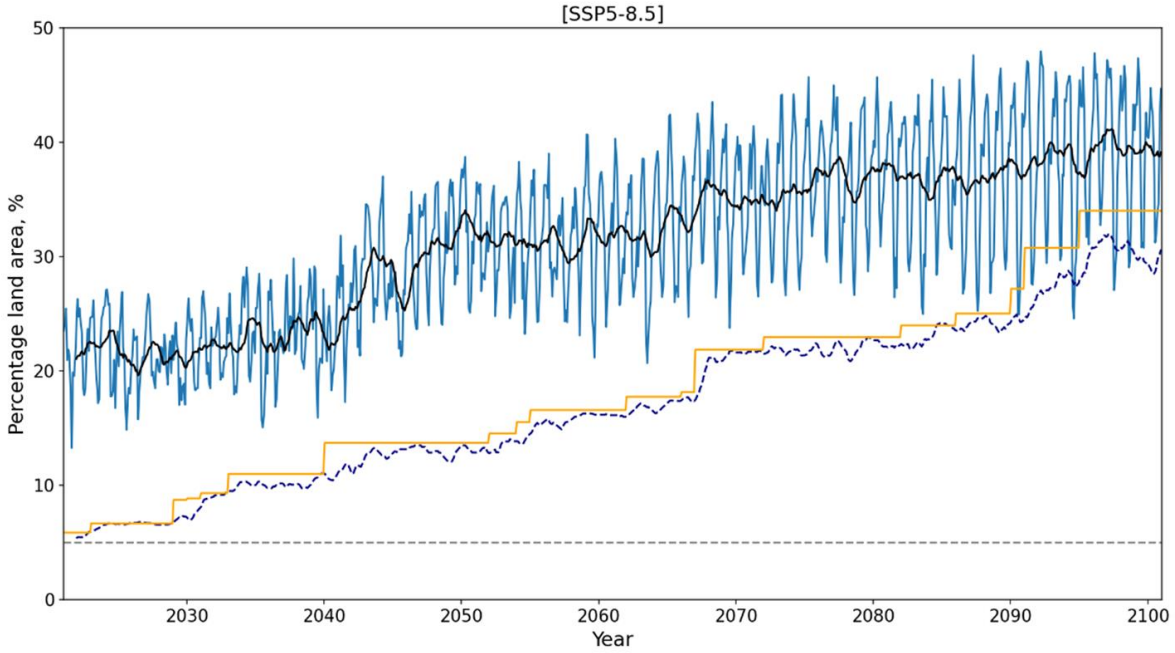


Figure S14. As in S11, but for the SSP5-8.5 scenario.

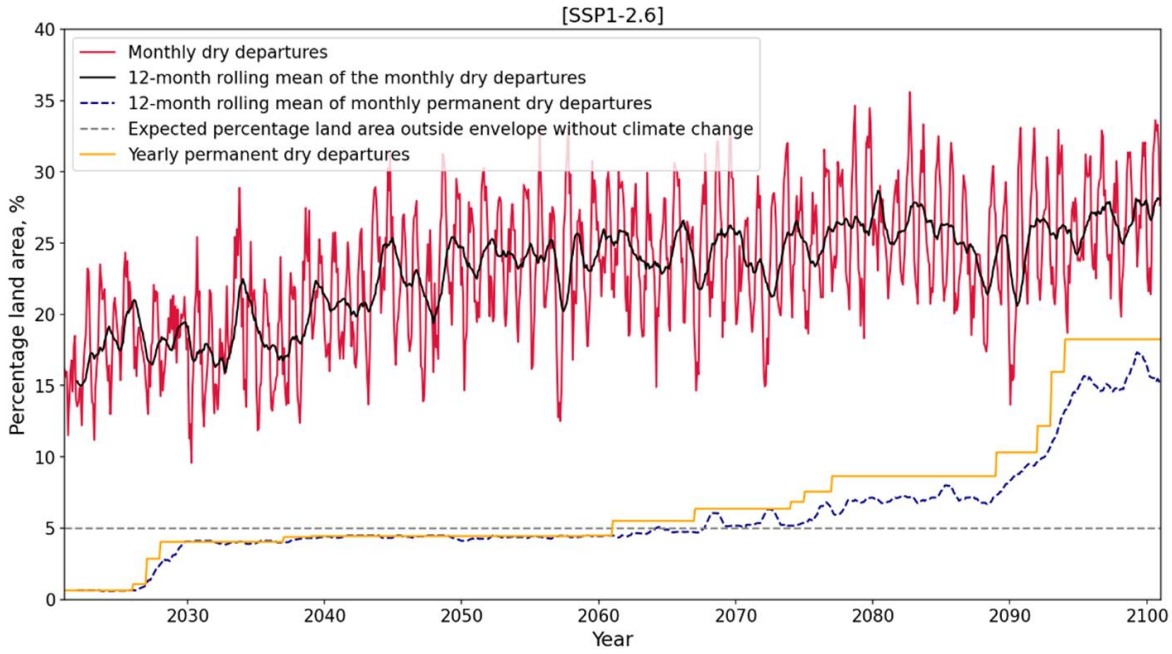


Figure S15. The changes in the percentage of the land area with dry departure in SSP1-2.6. The expected percentage (5 %) of land area outside the envelope (grey dotted line) is the land area that has lower total soil moisture content than the 5th percentile of the PiControl baseline even when climate was similar to pre-industrial conditions. The monthly dry departures are the land area where the monthly total soil moisture content is less than the 5th percentile of the PiControl baseline. The 12-month rolling mean of monthly permanent dry departures is computed from the monthly dry departures that occur only after the time of emergence. The yearly permanent dry departure is the proportion of land area with a yearly total soil moisture content that is less than the 5th percentile after the time of emergence. The graph is plotted with the ensemble medians.

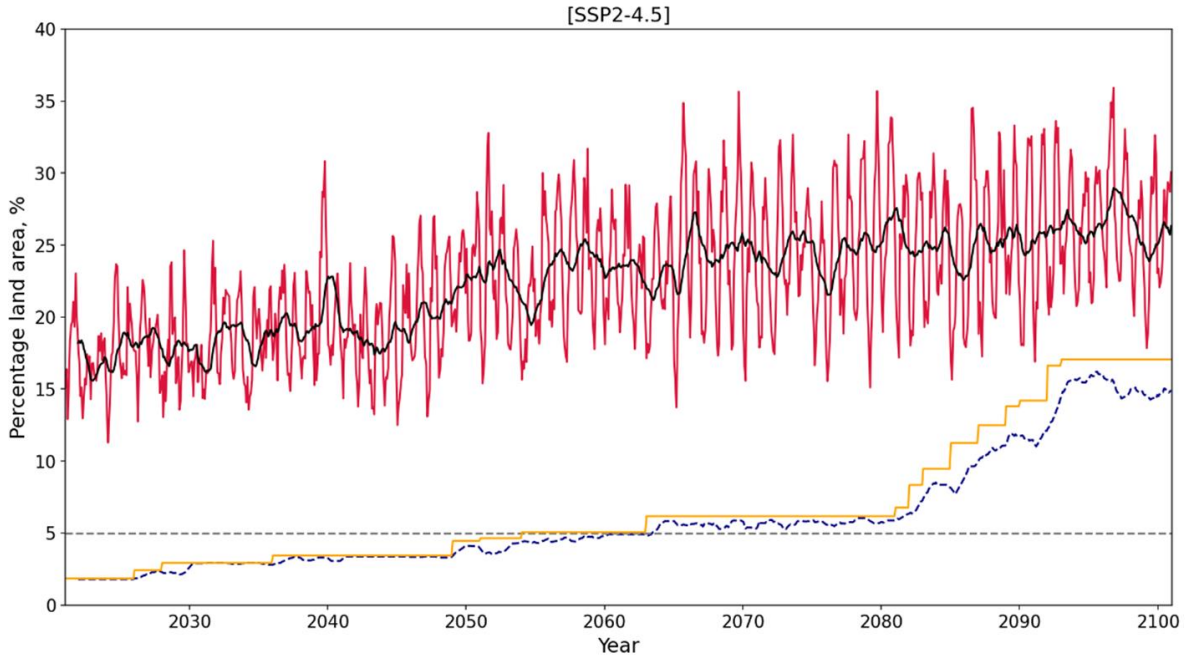


Figure S16. As in S15, but for the SSP2-4.5 scenario.

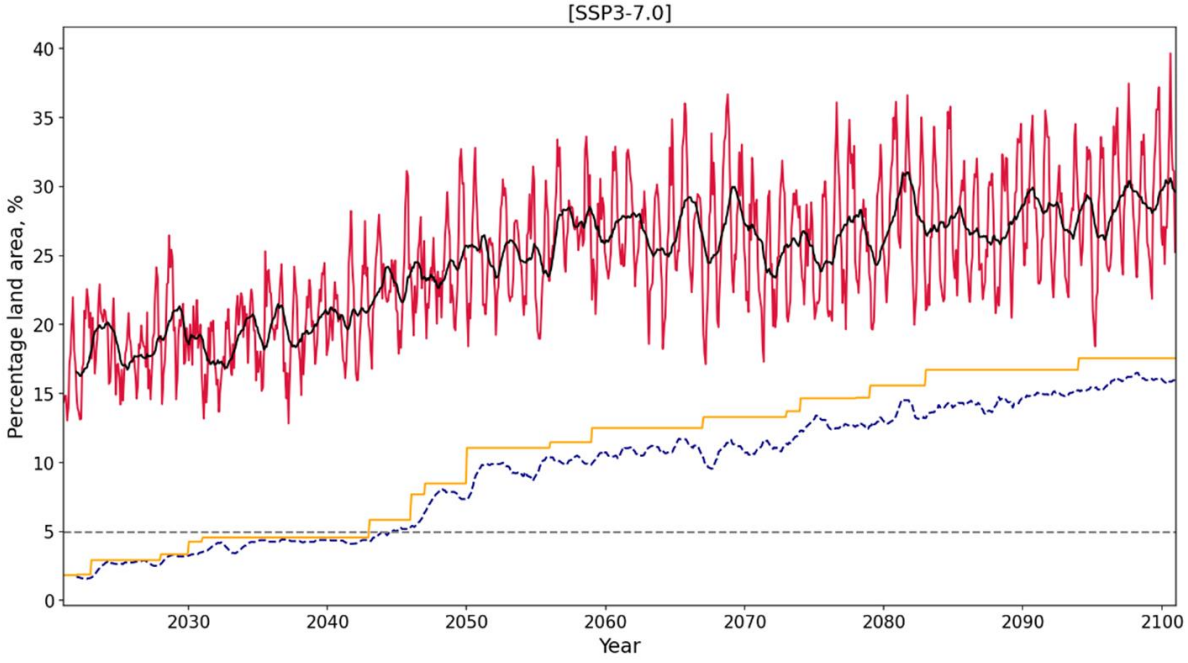


Figure S17. As in S15, but for the SSP3-7.0 scenario.

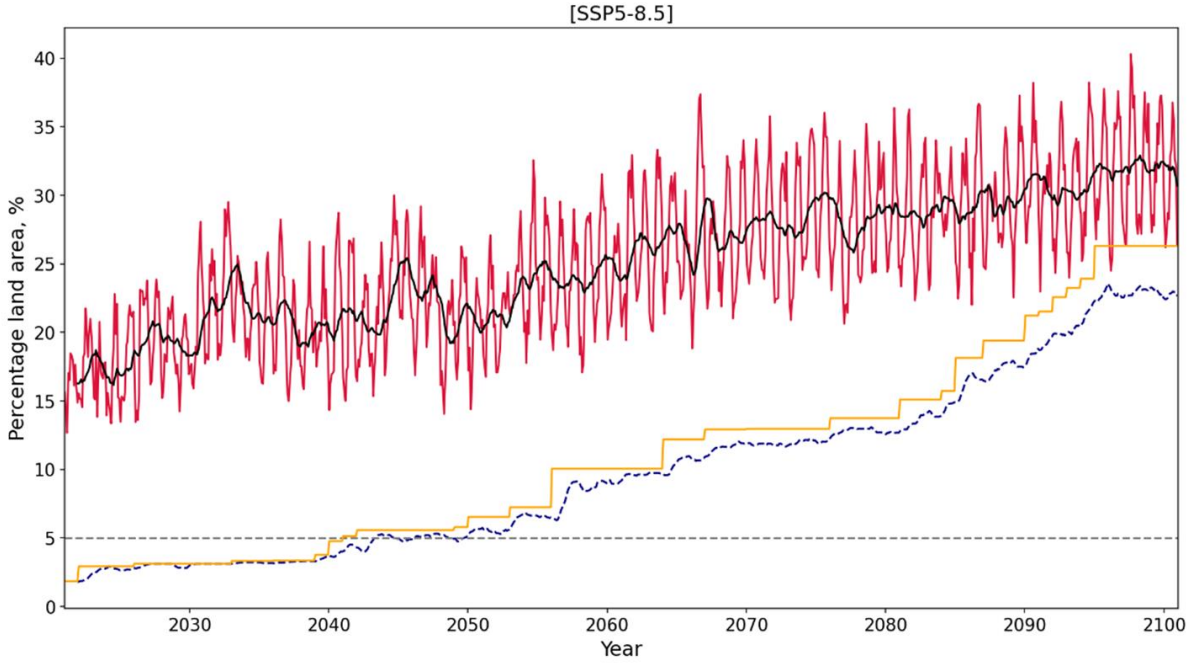


Figure S18. As in S15, but for the SSP5-8.5 scenario.

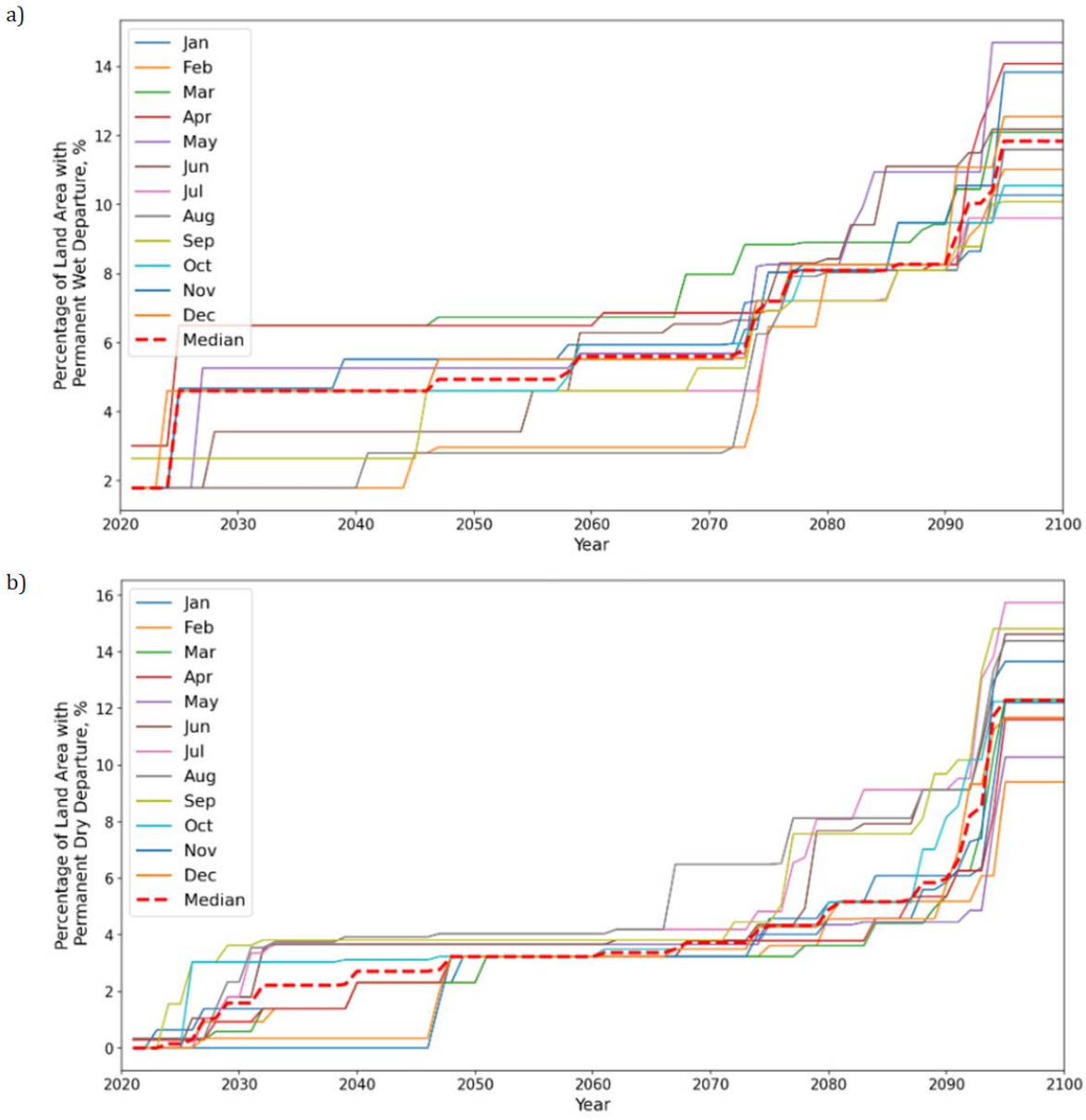


Figure S19. (a) Land area with permanent wet departure of soil moisture in each month across 2021-2100 for the SSP1-2.6 scenario. **(b)** As in (a), but for dry departure.

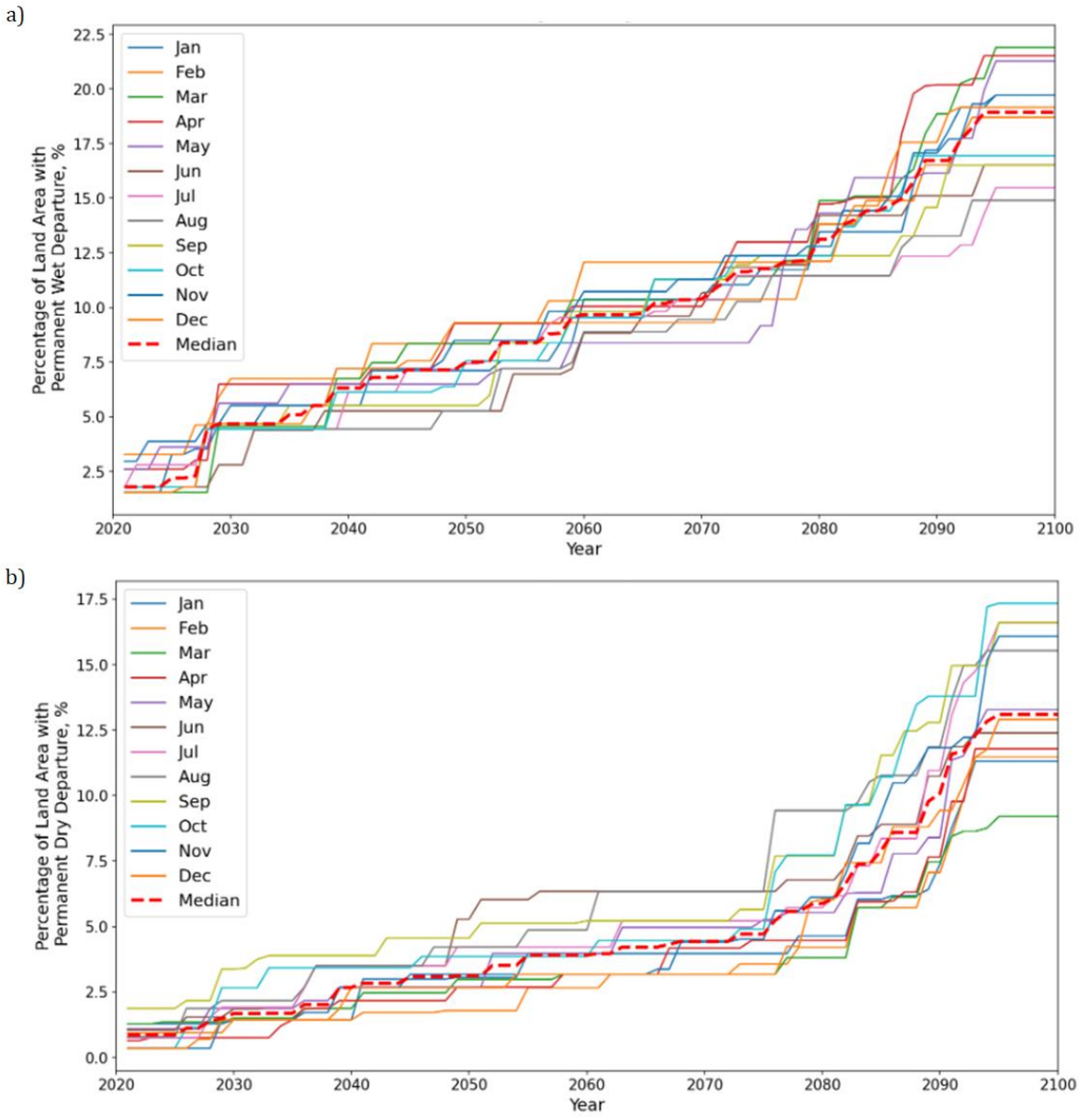


Figure S20. As in S19, but for the SSP2-4.5 scenario.

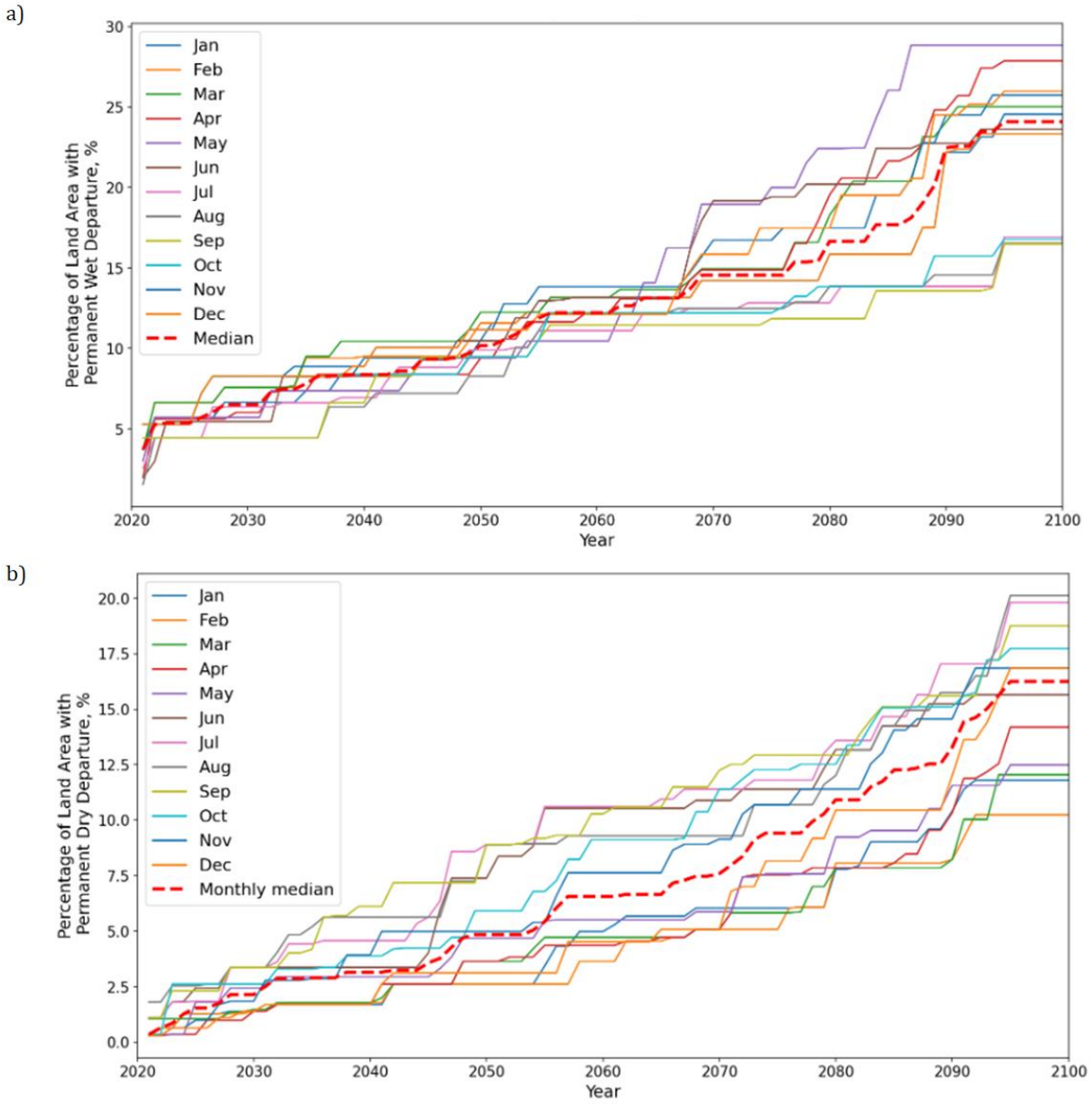


Figure S21. As in S19, but for the SSP3-7.0 scenario.

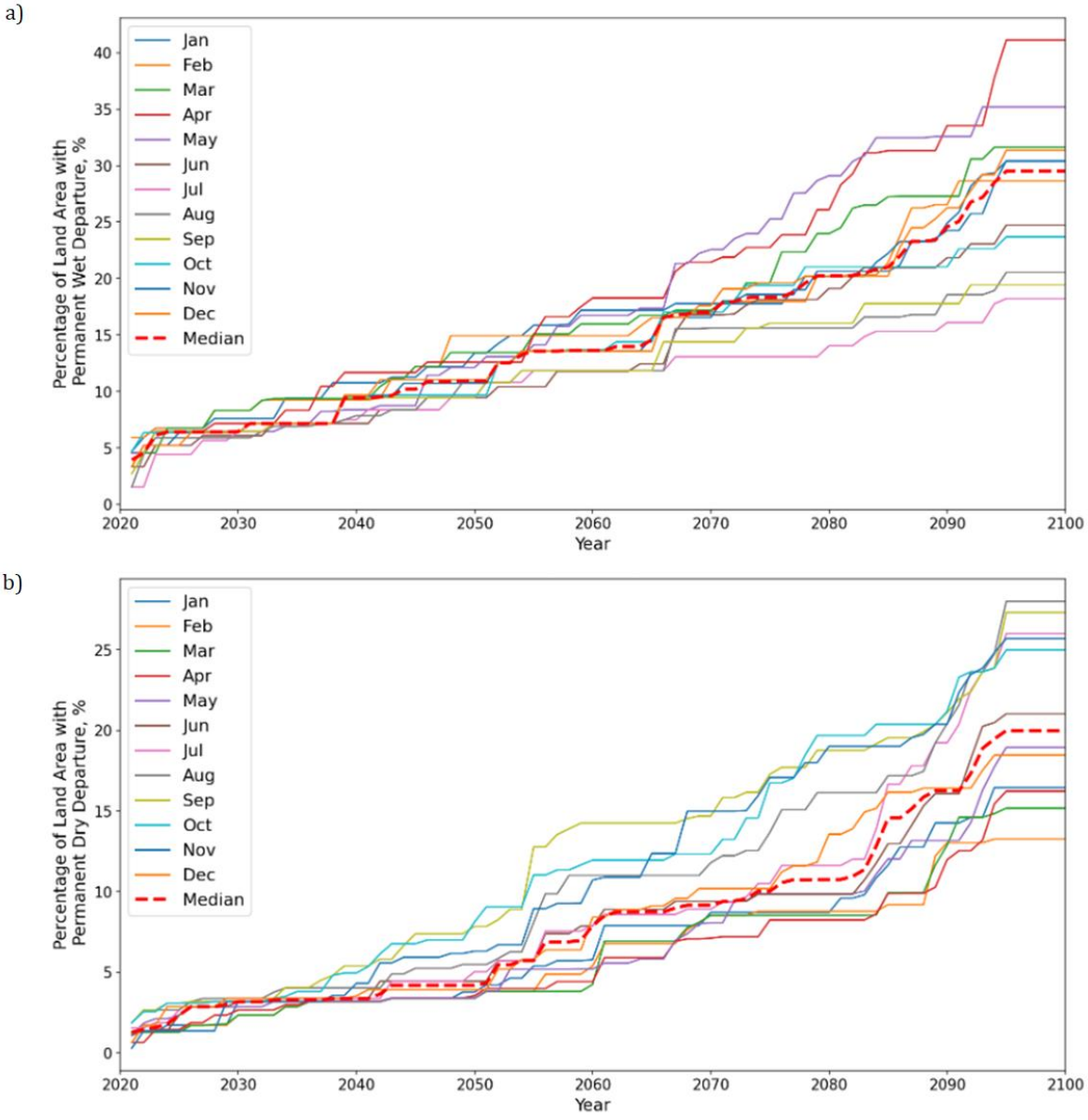


Figure S22. As in S19, but for the SSP5-8.5 scenario.

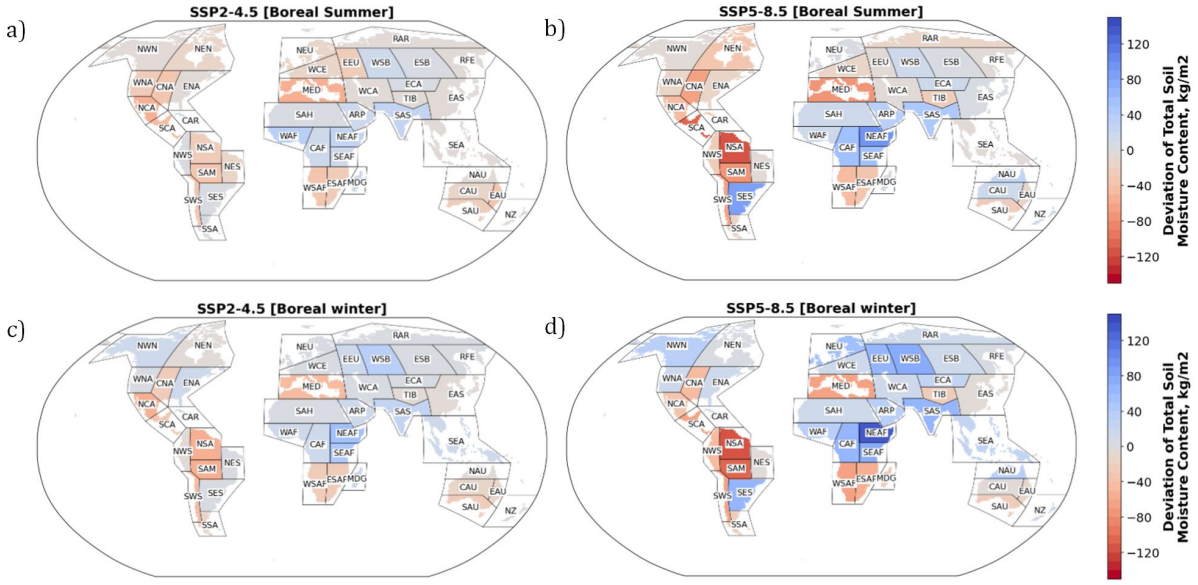


Figure S23. The deviation of the seasonal mean total soil moisture content (values shown in the maps are the ensemble median) in 2100 of SSP2-4.5 and SSP5-8.5 from the PiControl scenario.

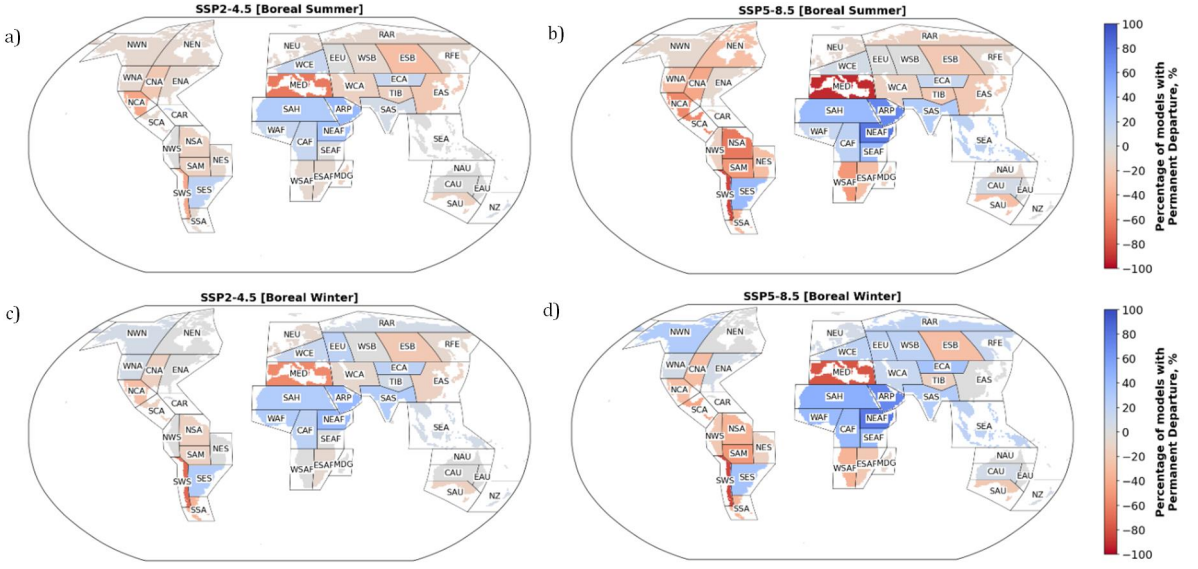


Figure S24. Percentage of models in SSP2-4.5 and SSP5-8.5 that show a permanent departure from the PiControl baseline in different seasons in 2100.

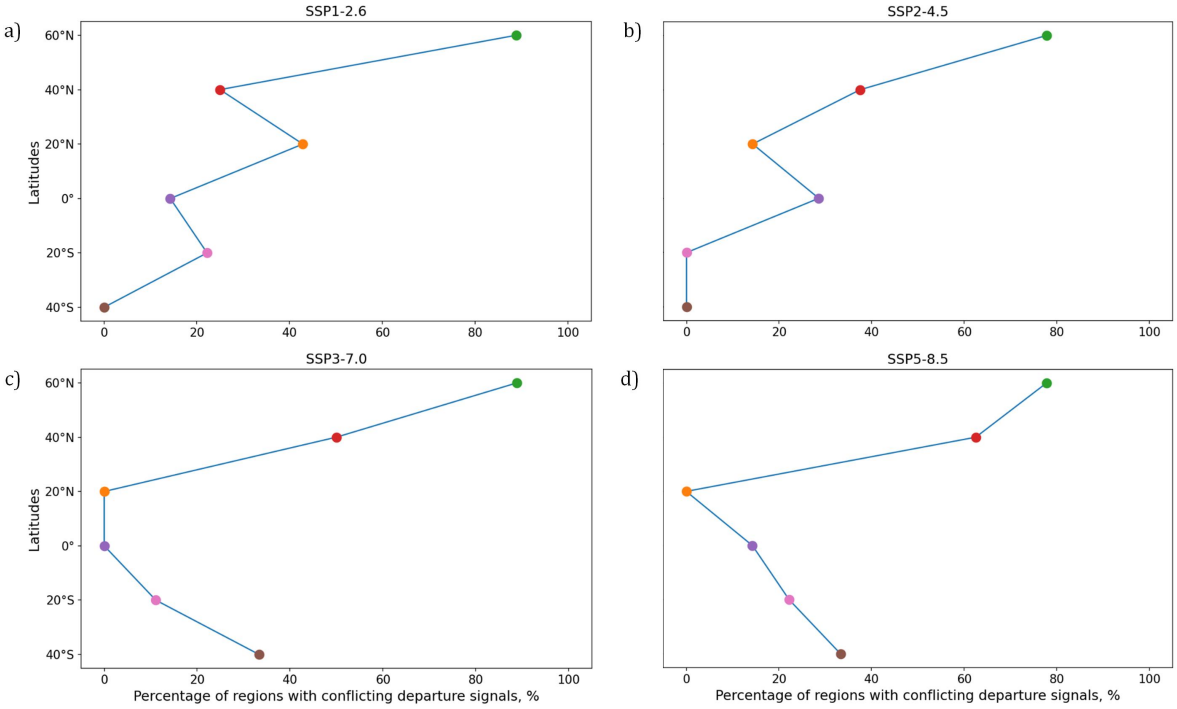


Figure S25. Percentage of regions that show conflicting wet and dry departure signals among ESMs around different latitudes in each SSP scenario.

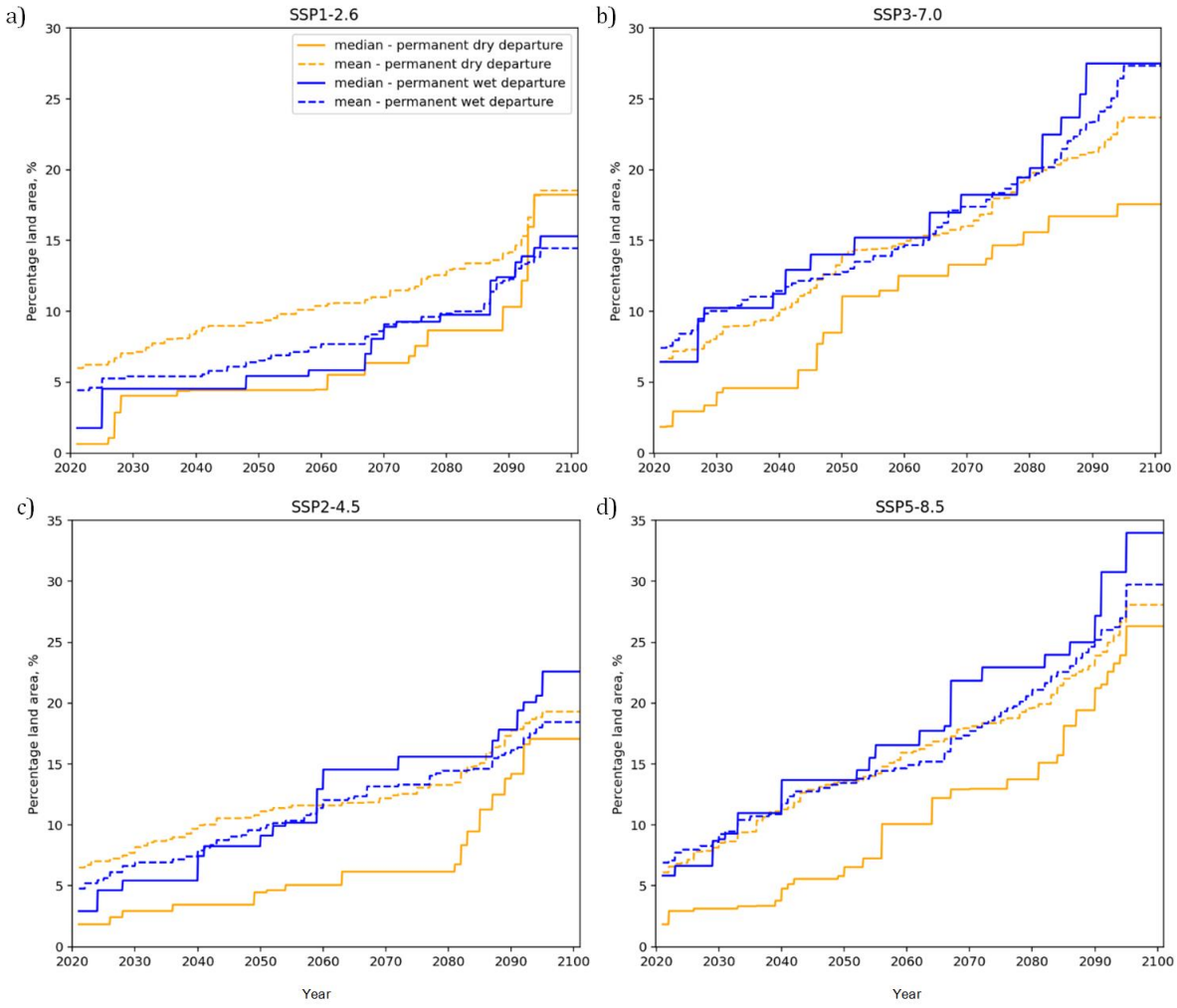


Figure S26. The differences between the ensemble mean and median land area with permanent departures for each SSP scenario.

Table S1. The member ID, version, and reference (hyperlink provided for more information) for the soil moisture data of each ESM used to construct a multi-model ensemble in this study.

	PiControl			SSP1-2.6		SSP2-4.5		SSP3-7.0		SSP5-8.5		
ESM	Member ID	Version	Reference	Member ID	Version	Member ID	Version	Member ID	Version	Member ID	Version	Reference
ACCESS-CM2	r1i1p1f1	v20191112	Dix et al. (2019)	r1i1p1f1	v20191108	r1i1p1f1	v20191108	r3i1p1f1	v20200428	r1i1p1f1	v20191108	Dix et al. (2019)
CanESM5	r1i1p2f1	v20190429	Swart et al. (2019)	r8i1p1f1	v20190429	r8i1p1f1	v20190306	r8i1p1f1	v20190306	r8i1p1f1	v20190306	Swart et al. (2019)
CESM2	r1i1p1f1	v20190320	Danabasoglu et al. (2019)	r10i1p1f1	v20200528	r10i1p1f1	v20200528	r4i1p1f1	v20200528	r11i1p1f1	v20200528	Danabasoglu (2019)
CESM2-WACCM	r1i1p1f1	v20190320	Danabasoglu et al. (2019)	r1i1p1f1	v20190815	r1i1p1f1	v20190815	r1i1p1f1	v20190815	r1i1p1f1	v20190815	Danabasoglu (2019)
CNRM-CM6-1	r1i1p1f2	v20180814	Voldoire (2018)	r1i1p1f2	v20190219	r1i1p1f2	v20190219	r2i1p1f2	v20190410	r1i1p1f2	v20190219	Voldoire (2018)
CNRM-ESM2-1	r1i1p1f2	v20181115	Seferian (2018)	r1i1p1f2	v20190328	r1i1p1f2	v20190328	r1i1p1f2	v20191021	r5i1p1f2	v20190410	Voldoire (2018)
EC-Earth3	r1i1p1f1	v20190712	EC-Earth (2019)	r13i1p1f1	v20200201	r11i1p1f1	v20200201	r4i1p1f1	v20200425	r1i1p1f1	v20190928	EC-Earth (2019)
EC-Earth3-Veg	r1i1p1f1	v20190619	EC-Earth (2019)	r1i1p1f1	v20190629	r1i1p1f1	v20190629	r3i1p1f1	v20200515	r1i1p1f1	v20190629	EC-Earth (2019)
GFDL-ESM4	r1i1p1f1	v20180701	Krasting et al. (2018)	r1i1p1f1	v20180701	r1i1p1f1	v20180701	r1i1p1f1	v20180701	r1i1p1f1	v20180701	John et al. (2018)
IPSL-CM6A-LR	r1i2p1f1	v20190319	Boucher et al. (2018)	r2i1p1f1	v20190410	r1i1p1f1	v20190119	r14i1p1f1	v20191122	r1i1p1f1	v20190903	Boucher et al. (2018)
MIROC6	r1i1p1f1	v20190311	Tatebe and Watanabe (2018)	r1i1p1f1	v20190627	r3i1p1f1	v20190627	r1i1p1f1	v20190627	r2i1p1f1	v20190627	Shiogama et al. (2019)
MIROC-ES2L	r1i1p1f2	v20190823	Hajima et al. (2019)	r1i1p1f2	v20190823	r1i1p1f2	v20190823	r1i1p1f2	v20190823	r1i1p1f2	v20190823	Tachiiri et al. (2019)
MPI-ESM1-2-HR	r1i1p1f1	v20190710	Jungclaus et al. (2019)	r1i1p1f1	v20190710	r2i1p1f1	v20190710	r7i1p1f1	v20190710	r1i1p1f1	v20190710	Schupfner et al. (2019)
UKESM1-0-LL	r1i1p1f2	v20190715	Tang et al. (2019)	r1i1p1f2	v20190708	r1i1p1f2	v20190715	r6i1p1f2	v20201014	r1i1p1f2	v20190726	Good et al. (2019)

Table S2: Time of emergence (TOE) of the regional total soil moisture content for each ESM in SSP1-2.6. Negative signs are introduced to the number of models with a dry departure (in which the total soil moisture is permanently lower that the 5th percentile in PiControl scenario). The net number of model is the sum of models with a dry departure and models with a wet departure in each climate region. These tables are also available as a data file: "Supplement-Tables S1-S12.xlsx".

Regions	ACCESS-CM2	CanESM5	CESM2	CESM2-WACCM	CNRM-CM6-1	CNRM-ESM2-1	EC-Earth3	EC-Earth3-Veg	GFDL-ESM4	IPSL-CM6A-LR	MIROC6	MIROC-ES2L	MPI-ESM1-2-HR	UKESM1-0-LL	Number of models with TOE	Net Number of Models
NWN	0	0	2045	2021	0	0	0	2098	2021	0	0	2048	0	0	4	-1
	2035	2021	0	0	2053	2021	0	0	0	0	0	0	0	2021	-5	
NEN	0	0	2021	2021	0	0	0	0	2021	0	0	0	0	0	3	-1
	2027	2100	0	0	2021	2021	0	0	0	0	2098	0	0	2021	-4	
WNA	0	0	0	0	0	0	0	0	2021	0	0	0	0	0	1	0
	2100	2099	2098	0	2100	2099	0	2092	0	0	0	0	0	0	-1	
CNA	0	0	0	0	0	0	2099	0	2029	0	0	0	0	0	1	-2
	0	2100	2098	0	0	2021	0	2093	0	0	2100	2052	0	0	-3	
ENA	0	0	0	2100	0	0	0	0	2097	0	0	0	0	0	0	-1
	0	2100	0	0	2083	0	0	0	0	0	0	0	0	2100	-1	
NCA	0	0	0	0	0	0	0	0	0	0	0	0	0	2099	0	-4
	0	0	0	0	0	0	2078	2080	0	0	2074	2021	0	0	-4	
SCA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	2099	0	2100	2097	2100	2099	0	0	0	2100	0	0	
CAR	0	0	2100	0	0	0	2100	0	0	0	2085	2021	0	0	2	1
	0	0	0	0	0	0	0	0	2099	0	0	0	2075	0	-1	
NWS	0	0	0	0	2100	0	0	0	0	0	0	0	0	0	0	-2
	0	2092	0	2096	0	2099	0	2095	0	0	0	2098	0	0	-2	
NSA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-3
	2099	2094	2100	2099	0	0	0	2100	2092	0	2089	2096	0	2099	-3	
NES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1
	2100	0	0	0	0	2021	0	0	0	0	0	0	0	2100	-1	
SAM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-3
	2099	2092	0	0	0	2021	2100	2096	2100	0	2077	0	0	2099	-3	
SWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-7
	2094	2037	2062	2094	0	2021	2021	2032	0	2100	2099	0	2097	0	-7	
SES	2097	0	2100	2096	0	0	0	0	2021	2100	2021	2021	0	0	3	2
	0	0	0	0	0	2021	0	2098	0	0	0	0	0	0	-1	
SSA	0	0	0	0	0	0	0	0	2021	0	0	0	0	0	1	-1
	0	2099	0	0	0	0	2021	2068	0	0	2096	2099	0	0	-2	
NEU	0	0	0	0	0	0	0	2100	2067	0	2050	0	0	0	2	-1
	2030	2100	0	0	2021	2021	0	0	0	0	0	2099	0	0	-3	
WCE	0	0	0	0	0	0	0	0	2100	0	0	2094	2099	0	1	1
	0	0	0	2100	0	0	2098	0	0	0	0	0	0	0	0	

Continuation of Table S2																
EEU	0	0	0	0	0	0	0	0	0	0	2081	2021	0	0	2	-1
	2051	0	2098	2100	2068	2021	0	0	0	0	0	0	0	0	-3	
MED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-10
	2095	2100	2040	2048	2098	2021	2026	2083	2067	2087	2032	2021	0	2096	-10	
SAH	0	2021	0	0	0	0	2025	2088	0	2070	0	0	0	0	4	-1
	2099	0	0	2091	0	0	0	0	2094	0	2093	2076	0	2071	-5	
WAF	0	0	0	0	0	0	2025	2067	0	2099	0	0	2092	2100	3	2
	0	0	0	0	0	2021	0	0	0	0	0	0	0	0	-1	
CAF	0	0	0	0	0	0	2095	2091	0	2060	0	0	2021	0	4	4
	0	2100	0	0	0	0	0	0	0	0	0	0	0	0	0	
NEAF	2094	0	2023	2021	0	0	2095	2091	0	2087	2021	0	2091	2095	9	9
	0	0	0	0	0	2099	0	0	0	0	0	0	0	0	0	
SEAF	0	2099	2100	2097	0	0	2100	2100	0	2099	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
WSAF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1
	2096	2098	2100	2096	0	2100	2099	2100	0	0	2093	0	0	0	-1	
ESAF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1
	2100	0	0	0	0	2100	0	0	0	0	2094	0	0	0	-1	
MDG	0	0	0	2098	0	0	0	0	2095	2097	2100	2021	0	0	2	1
	0	0	0	0	0	2021	0	0	0	0	0	0	0	0	-1	
RAR	0	0	2042	2067	0	0	2069	2087	2021	0	2100	0	2100	0	5	1
	0	2059	0	0	2021	2021	0	0	0	0	0	0	0	2021	-4	
WSB	0	2099	0	0	0	0	2096	2096	2052	0	2079	2076	0	0	3	0
	2089	0	2098	0	2041	2022	0	0	0	0	0	0	0	0	-3	
ESB	0	2099	0	0	0	0	2096	2058	0	0	2086	0	0	0	2	-3
	2033	0	0	0	2056	2021	0	0	0	2099	0	2039	0	2021	-5	
RFE	0	0	2076	0	0	0	2098	2096	2051	0	0	0	0	0	2	-2
	2028	0	0	0	2021	2021	0	0	0	0	0	0	0	2021	-4	
WCA	0	0	2100	0	0	0	2100	0	0	0	2099	0	2100	0	0	-1
	0	0	0	0	2098	2099	0	0	2093	0	0	2100	0	0	-1	
ECA	2041	0	0	0	0	0	2092	0	0	0	2021	2089	0	0	4	2
	0	2075	0	0	0	0	0	0	2021	0	0	0	0	0	-2	
TIB	0	0	2088	2021	0	2093	0	2090	2021	0	0	0	2100	0	5	2
	2042	2097	0	0	2021	0	0	0	0	0	0	0	0	2021	-3	
EAS	0	2099	0	0	0	0	0	0	0	0	0	0	0	0	0	-3
	0	0	0	0	2099	2080	2094	2094	0	2100	0	0	0	0	-3	
ARP	0	2072	2021	2021	0	0	2091	2068	0	2097	0	0	0	0	5	4
	0	0	0	0	0	0	0	0	2061	0	0	0	0	0	-1	
SAS	0	0	2086	2055	0	0	0	0	0	0	2087	0	2087	0	4	3
	0	0	0	0	0	2021	0	0	0	0	0	0	0	0	-1	
SEA	0	0	0	0	2097	0	0	0	0	0	2100	0	2099	0	0	-1
	0	0	0	0	0	2093	2099	2100	0	0	0	0	0	0	-1	

Continuation of Table S2																
NAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	2099	0	0	0	0	0	0	0	0	
CAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1
	2099	2100	0	0	0	0	2099	0	2028	0	0	0	0	0	-1	
EAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	2098	0	0	0	0	0	0	0	0	0	
SAU	0	0	0	0	0	0	0	0	0	0	2100	0	0	0	0	-3
	0	0	2081	2097	0	2021	2090	0	0	0	0	0	2100	0	-3	
NZ	0	0	0	0	0	0	0	0	2057	2100	2100	0	0	0	1	1
	0	0	2100	0	0	0	0	2096	0	0	0	0	2098	0	0	
End of TableS2																

Table S3: As in S2, but for SSP2-4.5 scenario.

Regions	ACCESS-CM2	CanESM5	CESM2	CESM2-WACCM	CNRM-CM6-1	CNRM-ESM2-1	EC-Earth3	EC-Earth3-Veg	GFDL-ESM4	IPSL-CM6A-LR	MIROC6	MIROC-ES2L	MPI-ESM1-2-HR	UKESM1-0-LL	Number of models with TOE	Net Number of Models
NWN	0	0	2030	2022	0	0	0	0	2021	0	0	2026	2094	0	5	0
	2040	2021	0	0	2038	2021	0	0	0	0	0	0	0	2021	-5	
NEN	0	0	2021	2021	0	0	0	0	2021	2100	0	2051	0	0	4	0
	2028	2100	0	0	2021	2021	0	0	0	0	0	0	0	2021	-4	
WNA	0	0	0	0	0	0	0	0	2021	0	0	0	2100	2100	1	0
	0	0	2098	2100	2100	0	0	2092	0	0	0	0	0	0	-1	
CNA	0	0	0	0	0	0	0	0	2060	0	0	0	2096	0	1	-3
	2100	0	0	0	0	2021	2093	2085	0	0	0	2052	0	0	-4	
ENA	0	0	2100	0	0	0	0	0	0	0	0	2099	0	0	0	-1
	2100	0	0	0	2090	0	0	0	0	0	0	0	0	0	-1	
NCA	0	0	0	0	0	0	0	0	2100	0	0	0	0	0	0	-7
	2100	0	2086	2085	2098	2069	2021	2051	0	2100	2032	2021	2100	0	-7	
SCA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-6
	0	2087	2098	2098	0	0	2086	2041	2091	0	2091	0	0	2094	-6	
CAR	0	0	2100	2083	0	0	0	0	0	0	2021	2021	0	0	3	3
	0	0	0	0	0	0	2099	0	0	0	0	0	0	2099	0	
NWS	0	0	0	0	0	0	0	0	0	0	2099	0	0	0	0	-2
	0	2087	0	2094	0	0	2099	0	0	0	0	2096	0	0	-2	
NSA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-2
	2096	2071	0	2100	0	0	2100	0	0	2100	2096	2050	0	0	-2	
NES	0	0	2099	2100	0	0	0	0	0	0	0	0	0	0	0	-1
	0	0	0	0	0	2021	0	2100	0	0	2099	2100	0	0	-1	
SAM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-4
	2099	2035	0	2099	2095	2021	2100	2100	2098	0	0	2036	0	0	-4	
SWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-10
	0	2029	2099	2090	2095	2022	2021	2021	2099	2088	2054	2084	2050	0	-10	
SES	0	0	2078	2079	0	0	0	0	2021	0	2021	2021	0	0	5	4
	0	2100	0	0	0	2021	0	0	0	0	0	0	0	0	-1	
SSA	0	0	2096	2100	0	0	0	0	2021	0	0	0	0	0	1	-4
	0	2100	0	0	0	2067	2021	2021	0	2100	2047	2082	0	0	-5	
NEU	0	0	2100	0	0	0	0	2099	2047	0	2058	0	0	0	2	-1
	2033	0	0	0	2030	2021	0	0	0	0	0	0	0	2100	-3	
WCE	0	0	0	0	0	0	0	0	2026	0	2054	0	0	0	2	2
	0	0	2100	0	0	0	2096	0	0	0	0	0	0	2100	0	
EEU	0	0	0	0	0	0	0	0	2093	0	2057	2021	0	0	3	0
	2055	0	0	0	2086	2021	2100	0	0	0	0	0	0	0	-3	
MED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-11
	2090	2093	2043	2026	2099	2030	2063	2081	2077	2069	2021	2049	2100	2098	-11	

Continuation of Table S3																
SAH	2092	2021	0	0	0	0	2028	2040	0	2067	0	0	2059	0	6	4
	0	0	0	2082	0	0	0	0	0	0	0	0	0	2075	-2	
WAF	2065	2099	0	0	0	0	2021	2021	2096	2094	0	0	2050	0	5	4
	0	0	0	0	0	2021	0	0	0	0	0	0	0	0	-1	
CAF	0	2100	0	0	0	0	2024	2087	0	2043	0	0	2021	0	4	4
	0	0	0	0	0	2099	0	0	0	0	0	0	0	0	0	
NEAF	2077	0	2043	2025	0	0	2092	2087	2057	2067	2021	2048	2089	2096	10	9
	0	0	0	0	0	2029	0	0	0	0	0	0	0	0	-1	
SEAF	2098	2096	0	2099	0	0	0	2097	0	2097	0	0	0	0	0	-1
	0	0	0	0	0	2021	0	0	0	0	0	0	0	0	-1	
WSAF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1
	2098	2098	2099	2100	2098	2100	2096	2083	0	0	2097	0	0	0	-1	
ESAF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1
	0	2098	0	0	0	2022	2100	2100	0	0	0	2099	0	0	-1	
MDG	0	0	2100	2099	0	0	0	0	0	0	0	2083	0	0	1	-2
	0	0	0	0	0	2021	2088	2075	0	0	2100	0	0	0	-3	
RAR	0	0	2036	2048	0	0	2099	2060	2021	0	2095	0	2100	0	5	0
	2095	2083	0	0	2039	2021	0	0	0	0	0	0	0	2021	-5	
WSB	0	2077	2097	2093	0	0	2100	2096	2090	0	0	2038	0	0	4	1
	2086	0	0	0	2021	2021	0	0	0	0	0	0	0	0	-3	
ESB	0	0	0	0	0	0	0	2087	0	0	0	0	2100	0	1	-5
	2043	0	0	0	2023	2021	0	0	2086	0	0	2089	0	2021	-6	
RFE	0	0	2057	2064	0	0	0	2097	2045	0	0	0	0	0	3	-1
	2030	0	0	0	2021	2021	0	0	0	0	0	2100	0	2021	-4	
WCA	0	0	0	0	0	0	0	0	0	0	0	2100	2100	0	0	-2
	0	0	0	0	2099	2082	0	0	2087	0	0	0	0	0	-2	
ECA	2022	0	0	0	0	0	2045	0	0	0	2021	2021	0	0	4	3
	0	2099	2100	0	2100	0	0	0	2021	0	0	0	0	0	-1	
TIB	0	0	2077	2084	0	0	2088	2088	2021	0	0	0	2099	0	5	1
	2039	0	0	0	2031	2072	0	0	0	0	0	2099	0	2021	-4	
EAS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-3
	0	0	0	0	2100	2021	2089	2092	0	2100	0	0	0	0	-3	
ARP	2092	2095	2021	2021	0	0	2072	2052	0	2087	2097	2098	2067	0	8	7
	0	0	0	0	0	0	0	0	2099	0	0	0	0	2032	-1	
SAS	2099	0	2021	2021	2100	0	2091	2098	0	0	2041	0	2042	2098	5	4
	0	0	0	0	0	2021	0	0	0	0	0	0	0	0	-1	
SEA	0	0	0	0	2099	0	0	0	0	0	2099	2060	2098	0	1	0
	0	0	0	0	0	2021	2100	0	0	0	0	0	0	0	-1	
NAU	0	0	0	0	2100	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	2100	0	0	0	0	0	0	0	
CAU	0	0	0	0	0	0	0	0	0	0	0	0	2077	0	1	0
	0	2097	0	0	0	0	2100	2100	2089	0	0	0	0	0	-1	

Continuation of Table S3																
EAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1
	0	0	0	0	0	2092	2100	0	0	0	0	2098	0	0	-1	
SAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-2
	2098	2099	2099	0	2099	2021	2099	2096	0	0	0	2089	2098	0	-2	
NZ	0	2100	0	0	0	0	0	0	2028	2095	0	0	0	0	2	2
	0	0	0	0	2100	2098	2098	0	0	0	0	0	0	0	0	
End of TableS3																

Table S4: As in S2, but for SSP3-7.0 scenario.

Regions	ACCESS-CM2	CanESM5	CESM2	CESM2-WACCM	CNRM-CM6-1	CNRM-ESM2-1	EC-Earth3	EC-Earth3-Veg	GFDL-ESM4	IPSL-CM6A-LR	MIROC6	MIROC-ES2L	MPI-ESM1-2-HR	UKESM1-0-LL	Number of models with TOE	Net Number of Models
NWN	0	0	2047	2041	0	0	2082	0	2021	2099	0	2076	2024	0	6	1
	2040	2021	0	0	2045	2021	0	0	0	0	0	0	0	2021	-5	
NEN	0	0	2021	2021	0	0	0	0	2021	0	2099	2069	0	0	4	0
	2023	0	0	0	2021	2021	0	2099	0	0	0	0	2099	2021	-4	
WNA	0	0	0	0	0	0	0	0	2021	0	2099	0	2092	2100	2	-1
	0	0	2099	2095	2100	2058	2096	2089	0	0	0	0	0	0	-3	
CNA	0	0	0	0	0	0	0	0	2093	0	0	0	0	2100	1	-3
	2098	2099	0	2097	0	2021	2092	2085	0	2100	2098	2047	0	0	-4	
ENA	0	0	2100	2100	0	0	0	0	2094	0	0	0	0	0	1	0
	2098	0	0	0	2098	2077	2096	2099	0	0	0	0	0	0	-1	
NCA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-7
	0	2095	2099	0	2093	2072	2021	2052	0	0	2022	2021	2100	0	-7	
SCA	0	0	0	0	0	0	0	0	0	0	0	2021	0	0	1	-8
	2084	2063	2094	2100	0	0	2093	2045	2056	2083	2073	0	0	2082	-9	
CAR	0	0	0	0	0	0	0	0	0	0	2021	2021	0	0	2	-3
	2084	2092	0	0	0	0	0	0	2056	2097	0	0	2087	2095	-5	
NWS	0	0	0	0	2100	0	0	0	0	0	2066	0	0	0	1	-6
	0	2063	2098	2061	0	2021	2072	2049	2084	2099	0	0	0	2091	-7	
NSA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-10
	2077	2031	0	2100	2074	2092	2094	2098	2067	2078	2050	2042	2099	2091	-10	
NES	0	0	2098	2100	0	0	0	0	0	0	0	0	0	0	0	-3
	0	2071	0	0	2100	2021	0	0	0	0	2059	0	0	0	-3	
SAM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-7
	2097	2029	0	0	2100	2021	2086	2088	2078	0	2100	2028	2099	2092	-7	
SWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-12
	2088	2032	2028	2062	2054	2021	2021	2021	2097	2070	2029	2046	2027	0	-12	
SES	2093	0	2066	2073	2095	0	0	0	2021	0	2021	2021	0	2100	7	6
	0	2096	0	0	0	2021	2097	0	0	0	0	0	0	0	-1	
SSA	0	0	0	0	0	0	0	0	2021	0	0	0	0	2099	1	-6
	2097	2076	0	0	2099	2035	2021	2021	0	2094	2046	2061	0	0	-7	
NEU	0	0	0	0	0	0	2100	2100	2021	0	2060	0	0	0	2	-2
	2037	0	0	0	2042	2021	0	0	0	0	0	2079	0	0	-4	
WCE	0	0	0	0	0	0	0	0	2058	0	2073	2099	0	0	2	2
	2098	0	2099	2099	0	0	2100	2100	0	2099	0	0	0	0	0	
EEU	0	0	0	0	0	0	0	0	2058	0	2021	2055	2100	2100	3	0
	2040	0	0	0	2082	2021	0	0	0	0	0	0	0	0	-3	
MED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-14
	2069	2072	2044	2021	2060	2021	2043	2051	2047	2043	2023	2030	2074	2094	-14	

Continuation of Table S4																
SAH	0	2021	2021	0	0	2094	2021	2027	0	2052	2067	2084	2021	0	9	7
	0	0	0	0	0	0	0	0	2046	0	0	0	0	2074	-2	
WAF	2043	2092	2086	0	2091	0	2021	2027	2091	2087	0	0	2021	2093	10	9
	0	0	0	0	0	2021	0	0	0	0	0	0	0	0	-1	
CAF	2065	0	2055	0	2086	0	0	2021	0	2026	2067	2099	2021	2096	7	6
	0	0	0	0	0	2028	0	0	0	0	0	0	0	0	-1	
NEAF	2050	2085	2023	2027	2099	0	2085	2078	2034	2029	2021	2039	2063	2059	12	11
	0	0	0	0	0	2021	0	0	0	0	0	0	0	0	-1	
SEAF	2093	2086	2078	2091	2099	0	0	2100	2073	2051	0	0	2067	2094	8	7
	0	0	0	0	0	2022	0	0	0	0	0	0	0	0	-1	
WSAF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-4
	0	2099	2100	2085	0	2041	2098	2097	0	2098	2083	2074	0	0	-4	
ESAF	2100	0	0	0	0	0	0	0	0	0	0	0	2094	0	1	0
	0	2100	0	2100	0	2021	2098	2099	0	0	2099	2097	0	0	-1	
MDG	0	0	2100	0	0	0	0	0	0	0	0	2099	2090	0	1	-2
	2100	0	0	0	0	2021	2090	2065	0	0	0	0	0	0	-3	
RAR	0	0	2039	2042	0	0	2028	2034	2021	0	0	0	0	0	5	0
	2080	2050	0	0	2036	2021	0	0	0	0	0	0	0	2021	-5	
WSB	0	2088	0	0	0	0	2100	2088	2023	2096	2035	2032	2094	0	6	3
	2049	0	0	0	2050	2021	0	0	0	0	0	0	0	0	-3	
ESB	0	2091	0	2074	0	0	2099	2089	0	0	2021	0	0	0	4	-1
	2039	0	0	0	2049	2021	0	0	2094	0	0	0	0	2021	-5	
RFE	0	0	2051	2058	0	0	2082	2064	2028	0	0	0	0	0	5	1
	2031	0	0	0	2021	2021	0	0	0	0	0	0	0	2021	-4	
WCA	2096	0	2097	0	0	0	0	2099	0	0	2095	2085	2098	2100	2	1
	0	0	0	0	2099	2078	0	0	0	0	0	0	0	0	-1	
ECA	2022	0	2074	2087	0	0	2033	2100	0	2080	2021	2045	0	0	7	6
	0	2100	0	0	0	2100	0	0	2021	0	0	0	0	0	-1	
TIB	0	0	2021	2021	0	0	0	2099	2021	0	0	0	2081	0	4	-1
	2030	0	0	0	2025	2080	0	0	0	2066	0	0	0	2031	-5	
EAS	0	0	0	0	0	0	0	0	0	0	0	0	2100	2100	0	-1
	0	2100	0	0	2100	2071	2097	2098	0	0	0	0	0	0	-1	
ARP	0	2095	2021	2021	0	0	2024	2021	0	2077	2077	0	2085	2100	8	8
	0	0	0	0	0	0	0	0	2099	0	0	0	0	0	0	
SAS	2096	2098	2021	2021	2095	0	0	2096	0	0	2065	2099	2021	2089	6	5
	0	0	0	0	0	2021	0	0	0	0	0	0	0	0	-1	
SEA	0	0	0	0	2094	0	0	0	0	2096	0	2064	2078	0	3	2
	0	2100	0	0	0	2021	2100	2099	0	0	0	0	0	0	-1	
NAU	0	0	2100	0	0	0	0	0	0	0	0	0	2098	0	0	0
	0	0	0	0	0	0	0	0	0	0	2100	0	0	0	0	
CAU	0	0	0	0	0	0	0	0	0	0	0	0	2063	0	1	0
	0	2100	0	0	0	2100	0	0	2080	0	0	0	0	0	-1	

Continuation of Table S4																
EAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1
	0	0	0	0	2100	2093	0	2100	0	0	0	0	0	0	-1	
SAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-4
	0	2100	2093	2093	2098	2021	2094	0	2098	0	2099	0	0	2100	-4	
NZ	0	0	0	2100	2099	0	0	0	2021	2094	0	2100	0	0	2	1
	0	0	0	0	0	2021	0	2099	0	0	0	0	2099	0	-1	
End of TableS4																

Table S5: As in S2, but for SSP5-8.5 scenario.

Regions	ACCESS-CM2	CanESM5	CESM2	CESM2-WACCM	CNRM-CM6-1	CNRM-ESM2-1	EC-Earth3	EC-Earth3-Veg	GFDL-ESM4	IPSL-CM6A-LR	MIROC6	MIROC-ES2L	MPI-ESM1-2-HR	UKESM1-0-LL	Number of models with TOE	Net Number of Models
NWN	0	0	2035	2021	0	0	2091	0	2021	2099	2089	2066	2094	0	7	2
	2036	2021	0	0	2033	2021	0	0	0	0	0	0	0	2021	-5	
NEN	0	0	2021	2021	0	0	0	0	0	0	2096	2067	0	0	3	-2
	2022	2057	0	0	2021	2023	0	0	0	0	0	0	0	2021	-5	
WNA	0	0	0	0	0	0	0	0	2021	0	2098	0	2095	2096	2	-1
	0	0	2098	0	0	2090	2083	2064	0	0	0	0	0	0	-3	
CNA	0	0	0	0	2100	0	0	0	2099	0	0	0	0	2097	0	-6
	2100	2088	2098	0	0	2021	2083	2056	0	0	2076	2047	0	0	-6	
ENA	0	0	2080	2096	0	0	0	0	0	0	0	0	0	2100	1	-2
	0	2094	0	0	2098	2098	2087	2085	0	0	2100	0	0	0	-3	
NCA	0	0	0	0	0	0	0	0	0	0	0	0	0	2097	0	-8
	0	0	2094	2095	2086	2059	2021	2050	0	0	2053	2021	2099	0	-8	
SCA	0	0	0	0	2100	0	0	0	0	0	0	0	0	0	0	-10
	2080	2043	2069	2059	0	2099	2084	2041	2057	2084	2069	0	0	2068	-10	
CAR	0	0	0	2096	0	0	0	0	0	0	2021	2021	0	0	2	-2
	2083	2099	0	0	0	0	0	2100	2070	0	0	0	2085	2078	-4	
NWS	2099	0	0	0	2099	0	0	0	0	0	2086	0	0	0	1	-6
	0	2041	2099	2094	0	2059	2059	2031	2095	0	0	2061	0	0	-7	
NSA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-12
	2043	2044	2100	2068	2075	2092	2099	2090	2058	2084	2056	2042	2095	2055	-12	
NES	0	0	2096	2100	0	0	0	0	0	0	0	0	2100	0	0	-4
	0	2087	0	0	0	2021	0	0	0	0	2084	2095	0	0	-4	
SAM	0	0	0	0	0	0	0	0	0	2100	0	0	0	0	0	-9
	2099	2038	0	2094	2093	2021	2078	2040	2067	0	2092	2048	0	2098	-9	
SWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-12
	2068	2035	2063	2089	2054	2028	2021	2021	0	2067	2039	2024	2066	0	-12	
SES	2087	0	2058	2070	2099	0	0	0	2021	2100	2021	2021	2097	2083	7	5
	0	2095	0	0	0	2021	0	2100	0	0	0	0	0	0	-2	
SSA	0	0	2100	0	0	0	0	0	2021	0	0	0	0	0	1	-6
	0	2059	0	0	2100	2063	2021	2021	0	2095	2049	2059	0	2099	-7	
NEU	0	0	2098	2099	0	0	2100	0	2021	2097	2052	2082	2098	2100	3	0
	2030	0	0	0	2033	2021	0	0	0	0	0	0	0	0	-3	
WCE	0	0	0	0	0	0	0	0	2080	0	2079	2095	0	0	3	3
	2098	0	0	0	0	0	0	2100	0	0	0	0	0	0	0	
EEU	0	2100	0	0	0	0	2100	0	2078	0	2055	2074	2099	2098	3	0
	2036	0	0	0	2066	2021	0	0	0	0	0	0	0	0	-3	
MED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-13
	2063	2062	2026	2022	2068	2021	2053	2085	2042	2036	2021	2033	2092	2098	-13	

Continuation of Table S5																
SAH	0	2021	2021	2095	2100	2100	2021	2033	0	2023	2066	2067	2040	0	9	8
	0	0	0	0	0	0	0	0	0	0	0	0	0	2043	-1	
WAF	2097	2091	0	0	2100	0	2023	2021	2088	2099	0	0	2021	0	5	4
	0	0	0	0	0	2021	0	0	0	0	0	0	0	0	-1	
CAF	2055	0	2095	2079	2076	0	2024	2021	2100	2030	2090	0	2021	2084	10	9
	0	0	0	0	0	2021	0	0	0	0	0	0	0	0	-1	
NEAF	2041	2070	2021	2021	2089	0	2040	2029	2038	2022	2021	2060	2041	2030	13	13
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
SEAF	2075	2083	2048	2062	0	0	2060	2054	0	2069	0	0	2042	2084	9	8
	0	0	0	0	0	2021	0	0	0	0	0	0	0	0	-1	
WSAF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-8
	2098	2078	2070	2056	2099	2086	2085	2064	0	0	2092	2091	0	0	-8	
ESAF	0	0	0	0	0	0	0	0	0	0	0	0	2098	0	0	-5
	0	2090	0	0	2099	2021	2095	2098	0	0	2089	2083	0	0	-5	
MDG	0	0	0	2100	0	0	0	0	2097	0	0	0	2080	0	1	-3
	0	0	0	0	0	2021	2094	2049	0	0	2094	0	0	0	-4	
RAR	0	0	2030	2040	0	0	2041	2033	2021	2095	0	0	2098	0	6	1
	2072	2084	0	0	2025	2021	0	0	0	0	0	0	0	2021	-5	
WSB	0	2095	0	0	0	0	0	2095	2052	2086	2073	2078	2096	2093	7	4
	2036	0	0	0	2038	2046	0	0	0	0	0	0	0	0	-3	
ESB	0	0	2075	2071	0	0	2099	2090	0	2098	2021	0	2097	0	4	-2
	2026	0	0	0	2030	2021	0	0	2081	0	0	2037	0	2021	-6	
RFE	0	0	2049	2046	0	0	2086	2082	2042	0	0	0	2096	0	5	1
	2026	0	0	0	2021	2021	0	0	0	0	0	2096	0	2021	-4	
WCA	2094	0	0	0	0	0	0	2099	0	0	0	0	2088	2095	3	0
	0	0	0	0	2079	2083	0	0	2090	0	0	0	0	0	-3	
ECA	2027	0	2077	2091	0	0	2021	2098	0	2080	2021	2027	0	2094	8	5
	0	0	0	0	2093	2091	0	0	2021	0	0	0	0	0	-3	
TIB	0	0	2021	2021	0	0	0	0	2021	0	0	0	2072	0	4	-1
	2033	2100	0	0	2021	2078	2097	0	0	2059	2098	2100	0	2021	-5	
EAS	0	0	2095	0	0	0	0	0	0	0	0	0	2082	0	2	-2
	0	2100	0	0	2095	2029	2094	2093	0	0	0	2097	0	0	-4	
ARP	2069	2029	2021	2021	0	0	2046	2048	0	2054	2062	2074	2042	0	10	10
	0	0	0	0	0	0	0	0	2100	0	0	0	0	0	0	
SAS	2098	2096	2021	2021	2087	0	2095	2091	2087	0	2033	0	2031	2098	8	7
	0	0	0	0	0	2021	0	0	0	0	0	0	0	0	-1	
SEA	0	0	0	0	2095	0	0	0	0	2100	2100	2067	2083	0	3	2
	0	2094	0	0	0	0	0	0	0	0	0	0	0	2100	-1	
NAU	0	0	0	0	2099	0	0	0	2097	0	0	0	2097	2100	0	-1
	0	2100	0	0	0	0	0	0	0	0	0	2095	0	0	-1	
CAU	0	0	0	0	0	0	0	0	0	0	2100	0	2072	0	1	1
	0	2099	0	0	0	0	0	0	0	2098	0	2100	0	0	0	

Continuation of Table S5																
EAU	0	0	0	0	0	0	0	0	0	0	2100	0	0	0	0	0
	0	0	0	0	0	2099	0	0	0	2099	0	2096	0	0	0	
SAU	0	0	0	0	0	0	0	0	2099	0	0	0	0	0	0	-4
	0	2100	2078	2089	0	2021	0	0	0	0	0	2095	0	2099	-4	
NZ	0	0	0	2099	2100	0	0	0	2021	2097	0	2100	0	2099	1	1
	0	0	0	0	0	0	2099	2098	0	0	0	0	0	0	0	
End of TableS5																

Table S6. Number of months with permanent dry departure in SSP1-2.6 for each climate reference region in every ESM. The land area covered in ice, i.e. Antartica and Greenland are excluded from the analysis. Negative signs are assigned to the ensemble means to denote dry departure.

Regions	ACCESS-CM2	CanESM5	CESM2	CESM2-WACCM	CNRM-CM6-1	CNRM-ESM2-1	EC-Earth3	EC-Earth3-Veg	GFDL-ESM4	IPSL-CM6A-LR	MIROC6	MIROC-ES2L	MPI-ESM1-2-HR	UKESM1-0-LL	Ensemble Mean
GIC	0	12	0	0	0	0	12	12	0	12	0	0	0	12	
NWN	12	9	0	0	12	12	0	0	0	0	0	0	0	12	-4.071428571
NEN	12	3	0	0	12	12	0	0	0	0	0	0	0	12	-3.642857143
WNA	0	0	1	4	0	2	0	7	0	0	0	0	0	0	-1
CNA	1	0	0	0	0	10	0	0	0	0	1	12	0	0	-1.714285714
ENA	0	0	0	0	2	0	0	0	0	0	0	0	0	0	-0.142857143
NCA	0	0	0	0	0	2	12	3	0	0	12	12	0	0	-2.928571429
SCA	0	0	0	0	0	0	0	1	0	0	0	0	0	0	-0.071428571
CAR	0	0	0	0	0	0	0	0	0	0	0	0	7	0	-0.5
NWS	0	1	0	0	0	1	0	5	0	0	0	1	0	0	-0.571428571
NSA	0	4	0	0	0	0	0	0	0	0	4	0	0	0	-0.571428571
NES	1	0	0	0	0	9	0	0	0	0	0	0	0	0	-0.714285714
SAM	0	5	0	0	0	12	0	2	0	0	6	0	0	0	-1.785714286
SWS	4	4	5	0	3	9	12	12	0	0	2	0	0	0	-3.642857143
SES	0	0	0	0	0	12	0	0	0	0	0	0	0	0	-0.857142857
SSA	0	4	0	0	0	1	5	12	0	0	1	0	0	0	-1.642857143
NEU	12	0	0	0	12	12	0	0	0	0	0	0	0	0	-2.571428571
WCE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EEU	11	0	2	0	4	12	0	0	0	0	0	0	0	0	-2.071428571
MED	4	0	12	12	0	9	10	4	5	1	12	12	0	0	-5.785714286
SAH	0	0	0	3	0	0	0	0	12	0	7	11	0	12	-3.214285714
WAF	0	0	0	0	0	11	0	0	0	0	0	0	0	0	-0.785714286
CAF	0	0	0	0	0	1	0	0	0	0	0	0	0	0	-0.071428571
NEAF	0	0	0	0	0	4	0	0	0	0	0	0	0	0	-0.285714286
SEAF	0	0	0	0	0	4	0	0	0	0	0	0	0	0	-0.285714286
WSAF	2	1	0	3	0	0	2	2	0	0	6	0	0	0	-1.142857143
ESAF	0	0	0	0	0	0	5	0	0	0	8	0	0	0	-0.928571429
MDG	0	0	0	0	0	6	0	2	0	0	0	0	0	0	-0.571428571
RAR	0	3	0	0	12	12	0	0	0	0	0	0	0	12	-2.785714286
WSB	7	0	2	0	12	12	0	0	0	0	0	0	0	0	-2.357142857
ESB	12	0	0	0	12	12	0	0	0	0	0	12	0	12	-4.285714286
RFE	12	0	0	0	12	12	0	0	0	0	0	0	0	12	-3.428571429
WCA	0	0	0	0	1	3	0	0	10	0	0	0	0	0	-1
ECA	0	5	0	0	0	0	0	0	12	0	0	0	0	0	-1.214285714
TIB	12	0	0	0	12	0	0	0	0	0	0	0	0	12	-2.571428571
EAS	0	0	0	0	0	0	5	5	0	0	0	0	0	0	-0.714285714
ARP	0	0	0	0	0	0	0	0	12	0	0	0	0	0	-0.857142857
SAS	0	0	0	0	0	12	0	0	0	0	0	0	0	0	-0.857142857
SEA	0	0	0	0	0	2	0	0	0	0	0	0	0	0	-0.142857143
NAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CAU	0	0	0	0	0	0	5	0	12	0	0	0	0	0	-1.214285714
EAU	0	0	0	0	0	3	4	0	0	0	0	0	0	0	-0.5
SAU	0	0	9	0	0	12	3	0	0	0	0	0	1	0	-1.785714286
NZ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EAN	0	12	0	0	0	0	0	0	0	0	0	0	0	0	
WAN	0	12	0	0	0	0	10	2	0	0	0	0	0	0	

Table S7. As in S6, but for the SSP2-4.5 scenario.

Regions	ACCESS-CM2	CanESM5	CESM2	CESM2-WACCM	CNRM-CM6-1	CNRM-ESM2-1	EC-Earth3	EC-Earth3-Veg	GFDL-ESM4	IPSL-CM6A-LR	MIROC6	MIROC-ES2L	MPI-ESM1-2-HR	UKESM1-0-LL	Ensemble Mean
GIC	0	12	0	0	0	0	12	12	0	12	0	0	0	11	
NWN	12	6	0	0	12	12	0	0	0	0	0	0	0	12	-3.857142857
NEN	12	3	0	0	12	12	0	0	0	0	0	0	0	12	-3.642857143
WNA	0	0	3	0	0	1	3	7	0	0	0	0	0	0	-1
CNA	0	2	0	0	0	4	10	7	0	0	0	12	0	0	-2.5
ENA	0	0	0	0	5	0	0	0	0	0	0	0	0	0	-0.357142857
NCA	0	0	4	6	0	3	10	12	0	0	12	12	0	0	-4.214285714
SCA	0	7	0	0	0	0	10	8	0	2	6	0	0	1	-2.428571429
CAR	0	0	0	0	0	0	0	0	0	2	0	0	5	0	-0.5
NWS	0	7	0	2	0	1	2	2	0	0	0	1	0	0	-1.071428571
NSA	0	7	0	0	0	0	0	0	0	0	2	12	0	0	-1.5
NES	0	0	0	0	0	8	0	0	0	0	0	0	0	0	-0.571428571
SAM	0	5	0	0	1	12	0	3	0	0	0	10	0	0	-2.214285714
SWS	4	8	2	6	6	12	12	12	2	0	12	12	12	0	-7.142857143
SES	0	2	0	0	0	12	0	0	0	0	0	0	0	0	-1
SSA	0	3	0	0	0	5	10	11	0	0	12	12	0	0	-3.785714286
NEU	12	0	0	0	12	12	0	0	0	0	0	0	0	0	-2.571428571
WCE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EEU	5	0	0	0	6	12	0	0	0	0	0	0	0	0	-1.642857143
MED	3	2	12	12	0	11	12	10	12	5	12	12	0	0	-7.357142857
SAH	0	0	0	12	0	0	0	0	0	0	0	0	0	10	-1.571428571
WAF	0	0	0	0	0	12	0	0	0	0	0	0	0	0	-0.857142857
CAF	0	0	0	0	0	1	0	0	0	0	0	0	0	0	-0.071428571
NEAF	0	0	0	0	0	4	0	0	0	0	0	0	0	0	-0.285714286
SEAF	0	0	0	0	0	5	0	0	0	0	0	0	0	0	-0.357142857
WSAF	0	3	0	1	3	4	0	9	0	0	0	0	0	0	-1.428571429
ESAF	0	2	0	0	0	6	0	0	0	0	0	2	0	0	-0.714285714
MDG	0	2	0	0	0	7	5	9	0	0	0	0	0	0	-1.642857143
RAR	4	3	0	0	12	12	0	0	0	0	0	0	0	12	-3.071428571
WSB	11	0	0	0	12	12	0	0	0	0	0	0	0	0	-2.5
ESB	12	0	0	0	12	12	0	0	3	0	0	12	0	12	-4.5
RFE	12	0	0	0	12	12	0	0	0	0	0	0	0	12	-3.428571429
WCA	0	0	0	0	0	6	0	0	12	1	0	0	0	0	-1.357142857
ECA	0	0	0	0	0	0	0	0	12	0	0	0	0	0	-0.857142857
TIB	12	3	0	0	12	11	0	0	0	0	0	0	0	12	-3.571428571
EAS	0	0	0	0	0	12	7	6	0	0	0	0	0	0	-1.785714286
ARP	0	0	0	0	0	0	0	0	0	0	0	0	0	6	-0.428571429
SAS	0	0	0	0	0	12	0	0	0	0	0	0	0	0	-0.857142857
SEA	0	0	0	0	0	9	0	0	0	0	0	0	0	0	-0.642857143
NAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CAU	0	3	0	0	0	0	0	2	12	0	0	0	0	0	-1.214285714
EAU	0	0	0	0	0	2	0	0	0	0	0	0	0	0	-0.142857143
SAU	0	0	0	0	0	12	0	2	0	0	0	12	0	0	-1.857142857
NZ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EAN	0	12	0	0	0	0	9	2	0	0	0	0	0	0	
WAN	0	12	0	0	0	0	12	12	0	0	0	0	0	0	

Table S8. As in S6, but for the SSP3-7.0 scenario.

Regions	ACCESS-CM2	CanESM5	CESM2	CESM2-WACCM	CNRM-CM6-1	CNRM-ESM2-1	EC-Earth3	EC-Earth3-Veg	GFDL-ESM4	IPSL-CM6A-LR	MIROC6	MIROC-ES2L	MPI-ESM1-2-HR	UKESM1-0-LL	Ensemble Mean
GIC	0	12	0	0	0	0	12	12	0	12	0	0	0	12	
NWN	12	4	0	0	12	12	0	0	0	0	0	0	0	12	-3.714285714
NEN	12	5	0	0	12	12	0	3	0	4	0	0	0	12	-4.285714286
WNA	0	2	1	5	0	6	6	8	0	0	0	0	0	0	-2
CNA	0	0	0	0	0	12	3	10	0	0	0	12	0	0	-2.642857143
ENA	0	0	0	0	2	3	1	0	0	0	0	0	0	0	-0.428571429
NCA	0	1	0	0	1	4	11	12	0	0	12	12	1	0	-3.857142857
SCA	2	3	5	0	0	0	12	9	12	4	12	0	0	9	-4.857142857
CAR	4	5	0	0	0	0	2	0	12	4	0	0	2	7	-2.571428571
NWS	1	8	1	4	0	12	6	6	11	0	0	0	0	7	-4
NSA	12	4	7	1	8	6	7	0	12	7	12	12	2	7	-6.928571429
NES	0	3	0	0	0	10	0	0	0	0	12	0	0	0	-1.785714286
SAM	0	11	1	0	0	12	7	6	12	2	0	12	0	4	-4.785714286
SWS	11	12	7	9	10	12	12	12	0	4	12	12	7	0	-8.571428571
SES	0	0	0	0	0	12	0	0	0	0	0	0	0	0	-0.857142857
SSA	1	12	0	0	0	7	12	12	0	4	8	12	0	0	-4.857142857
NEU	12	2	0	0	12	12	0	0	0	0	0	12	0	0	-3.571428571
WCE	1	0	1	2	0	0	0	0	0	0	0	0	0	0	-0.285714286
EEU	7	0	0	0	12	12	4	0	0	0	0	0	0	0	-2.5
MED	12	9	12	12	6	12	12	12	12	11	12	12	9	2	-10.35714286
SAH	0	0	0	0	0	0	0	0	11	0	0	0	0	11	-1.571428571
WAF	0	0	0	0	0	12	0	0	0	0	0	0	0	0	-0.857142857
CAF	0	0	0	0	0	12	0	0	0	0	0	0	0	0	-0.857142857
NEAF	0	0	0	0	0	10	0	0	0	0	0	0	0	0	-0.714285714
SEAF	0	0	0	0	0	12	0	0	0	0	0	0	0	0	-0.857142857
WSAF	1	6	0	12	0	9	2	5	0	1	9	12	0	0	-4.071428571
ESAF	0	3	0	0	0	12	0	0	0	0	0	0	0	0	-1.071428571
MDG	0	0	0	0	0	12	7	6	0	0	0	0	0	0	-1.785714286
RAR	12	4	0	0	12	12	0	0	0	0	0	0	0	12	-3.714285714
WSB	10	0	0	0	12	12	0	0	0	0	0	0	0	0	-2.428571429
ESB	12	0	0	0	12	12	0	0	5	0	0	0	0	12	-3.785714286
RFE	12	0	0	0	12	12	0	0	0	0	0	0	0	12	-3.428571429
WCA	0	0	0	0	4	6	0	0	0	4	0	0	0	0	-1
ECA	0	0	0	0	0	0	0	0	12	0	0	0	0	0	-0.857142857
TIB	12	1	0	0	12	12	0	0	0	9	0	0	0	12	-4.142857143
EAS	0	0	0	0	0	0	0	1	0	0	0	0	0	0	-0.071428571
ARP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SAS	0	0	0	0	0	12	0	0	0	0	0	0	0	0	-0.857142857
SEA	0	0	0	0	0	5	0	0	0	0	0	0	0	0	-0.357142857
NAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CAU	0	3	0	0	0	0	1	0	12	0	0	0	0	0	-1.142857143
EAU	0	0	0	0	0	6	0	0	0	0	0	0	0	0	-0.428571429
SAU	0	4	6	12	0	12	6	0	0	0	0	1	0	0	-2.928571429
NZ	0	0	0	0	0	12	0	0	0	0	0	0	0	0	-0.857142857
EAN	0	12	0	0	0	0	0	10	0	0	0	0	0	0	
WAN	0	12	0	0	0	0	11	11	0	0	0	0	0	0	

Table S9. As in S6, but for the SSP5-8.5 scenario.

Regions	ACCESS-CM2	CanESM5	CESM2	CESM2-WACCM	CNRM-CM6-1	CNRM-ESM2-1	EC-Earth3	EC-Earth3-Veg	GFDL-ESM4	IPSL-CM6A-LR	MIROC6	MIROC-ES2L	MPI-ESM1-2-HR	UKESM1-0-LL	Ensemble Mean
GIC	0	12	0	0	0	5	12	12	0	12	0	0	0	12	
NWN	12	5	0	0	12	12	0	0	0	0	0	0	0	12	-3.785714286
NEN	12	6	0	0	12	12	3	3	0	1	0	0	1	12	-4.428571429
WNA	0	3	2	4	0	4	9	9	0	0	0	0	0	0	-2.214285714
CNA	1	4	0	0	0	6	9	12	0	0	7	12	0	0	-3.642857143
ENA	0	3	0	0	0	0	2	5	0	0	0	0	0	0	-0.714285714
NCA	0	3	7	6	3	8	11	7	0	0	12	12	1	0	-5
SCA	1	10	12	2	0	1	10	12	12	4	12	0	0	5	-5.785714286
CAR	4	2	0	0	0	0	0	1	8	2	0	0	7	9	-2.357142857
NWS	0	5	0	10	0	5	6	8	2	0	0	12	0	1	-3.5
NSA	4	7	3	12	10	3	0	4	12	8	12	12	5	6	-7
NES	0	8	0	0	0	12	0	0	0	0	10	5	0	0	-2.5
SAM	0	11	0	11	4	12	5	11	12	1	8	12	0	0	-6.214285714
SWS	7	12	11	12	12	12	12	12	0	11	12	12	12	0	-9.785714286
SES	0	3	0	0	0	12	0	3	0	0	0	0	0	0	-1.285714286
SSA	0	12	0	0	0	12	12	12	0	5	12	12	0	0	-5.5
NEU	12	1	0	0	12	12	0	1	0	0	0	0	0	0	-2.714285714
WCE	4	2	0	0	0	0	0	0	0	0	0	0	0	0	-0.428571429
EEU	12	0	1	0	7	12	0	0	0	0	0	0	0	0	-2.285714286
MED	9	11	12	12	8	12	12	12	12	12	12	12	12	0	-10.57142857
SAH	0	0	0	0	0	0	0	0	0	0	0	0	0	12	-0.857142857
WAF	0	0	0	0	0	12	0	0	0	0	0	0	0	0	-0.857142857
CAF	0	0	0	0	0	12	0	0	0	0	0	0	0	0	-0.857142857
NEAF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SEAF	0	0	0	0	0	7	0	0	0	0	0	0	0	0	-0.5
WSAF	0	6	11	12	3	6	10	10	0	2	7	8	0	0	-5.357142857
ESAF	0	4	0	0	4	6	7	5	0	0	12	11	0	0	-3.5
MDG	0	2	0	0	0	8	9	7	0	0	12	0	0	0	-2.714285714
RAR	12	4	0	0	12	12	0	0	0	0	0	0	0	12	-3.714285714
WSB	12	0	0	0	12	12	0	0	0	0	0	0	0	0	-2.571428571
ESB	12	0	0	0	12	12	0	0	9	0	0	12	0	12	-4.928571429
RFE	12	1	0	0	12	12	0	0	0	0	0	2	0	12	-3.642857143
WCA	0	0	0	0	6	6	0	0	8	3	0	0	0	0	-1.642857143
ECA	0	0	0	0	11	5	0	0	12	0	0	0	0	0	-2
TIB	12	3	0	0	12	12	0	0	0	12	0	0	0	12	-4.5
EAS	0	0	0	0	0	8	4	5	0	0	0	4	0	0	-1.5
ARP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SAS	0	0	0	0	0	12	0	0	0	0	0	0	0	0	-0.857142857
SEA	0	3	0	0	0	0	0	0	0	0	0	0	0	0	-0.214285714
NAU	0	0	0	0	0	0	0	0	0	0	0	7	0	0	-0.5
CAU	0	2	0	0	0	0	0	0	0	3	0	0	0	0	-0.357142857
EAU	0	0	0	0	0	0	0	0	0	0	0	4	0	0	-0.285714286
SAU	1	2	10	12	0	12	0	0	0	0	0	6	0	4	-3.357142857
NZ	0	0	0	0	0	0	0	1	0	0	0	0	0	0	-0.071428571
EAN	0	12	0	0	0	0	0	9	0	0	0	0	0	0	
WAN	0	12	0	0	0	0	10	11	0	0	0	0	0	0	

Table S10. Number of months with permanent wet departure in SSP1-2.6 for each climate reference region in every ESM. The land area covered in ice, i.e. Antartica and Greenland are excluded from the analysis. These tables are also available as a data file: "Supplement-Tables S1-S12.xlsx".

Regions	ACCESS-CM2	CanESM5	CESM2	CESM2-WACCM	CNRM-CM6-1	CNRM-ESM2-1	EC-Earth3	EC-Earth3-Veg	GFDL-ESM4	IPSL-CM6A-LR	MIROC6	MIROC-ES2L	MPI-ESM1-2-HR	UKESM1-0-LL	Ensemble Mean
GIC	3	0	2	0	5	1	0	0	0	0	0	0	0	0	
NWN	0	0	12	12	0	0	1	0	12	0	0	12	0	0	3.5
NEN	0	0	12	12	0	0	0	0	11	0	0	0	0	0	2.5
WNA	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0.857142857
CNA	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0.857142857
ENA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NCA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SCA	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.071428571
CAR	0	0	0	0	0	0	0	0	0	0	8	12	0	0	1.428571429
NWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NSA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SAM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SES	0	0	0	3	0	0	0	0	12	0	12	12	0	0	2.785714286
SSA	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0.857142857
NEU	0	0	0	0	0	0	0	0	5	0	9	0	0	0	1
WCE	0	0	0	0	0	0	0	0	0	0	0	12	3	0	1.071428571
EEU	0	0	0	0	0	0	0	0	0	0	12	12	0	3	1.928571429
MED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SAH	0	12	0	0	0	0	12	4	0	12	0	0	0	0	2.857142857
WAF	0	1	0	0	0	0	12	12	4	3	0	0	9	0	2.928571429
CAF	0	0	0	0	0	0	9	7	0	0	0	0	12	0	2
NEAF	3	0	9	12	0	0	4	0	0	3	12	0	3	0	3.285714286
SEAF	0	0	0	5	0	0	0	0	0	0	0	0	2	0	0.5
WSAF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ESAF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MDG	0	0	0	1	0	0	0	0	7	0	0	12	0	0	1.428571429
RAR	0	0	12	4	0	0	6	10	12	0	1	0	0	0	3.214285714
WSB	0	1	0	0	0	0	0	2	12	0	8	12	0	0	2.5
ESB	0	1	0	0	0	0	1	5	0	0	12	0	0	0	1.357142857
RFE	0	2	9	1	0	0	0	0	10	0	0	0	0	0	1.571428571
WCA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ECA	11	0	0	0	0	0	0	0	0	0	12	6	0	0	2.071428571
TIB	0	0	2	2	0	5	0	9	12	0	0	0	0	0	2.142857143
EAS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ARP	0	12	12	12	0	0	12	6	0	0	0	0	0	0	3.857142857
SAS	0	0	6	3	0	0	0	0	0	0	12	0	0	0	1.5
SEA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CAU	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0.285714286
EAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SAU	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0.071428571
NZ	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0.857142857
EAN	9	0	12	12	12	12	0	0	0	0	0	0	0	0	
WAN	2	0	12	12	12	6	0	0	0	0	0	0	0	0	

Table S11. As in S10, but for the SSP2-4.5 scenario.

Regions	ACCESS-CM2	CanESM5	CESM2	CESM2-WACCM	CNRM-CM6-1	CNRM-ESM2-1	EC-Earth3	EC-Earth3-Veg	GFDL-ESM4	IPSL-CM6A-LR	MIROC6	MIROC-ES2L	MPI-ESM1-2-HR	UKESM1-0-LL	Ensemble Mean
GIC	5	0	6	1	5	1	0	0	8	0	0	0	0	0	
NWN	0	0	12	12	0	0	0	0	12	0	0	12	4	0	3.714285714
NEN	0	0	12	12	0	0	0	0	9	0	0	12	0	0	3.214285714
WNA	0	0	0	0	0	0	0	0	12	0	0	0	0	1	0.928571429
CNA	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0.857142857
ENA	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0.142857143
NCA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SCA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CAR	0	0	1	1	0	0	0	0	0	0	12	12	0	0	1.857142857
NWS	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0.142857143
NSA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NES	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.071428571
SAM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SES	0	0	12	6	0	0	0	0	12	0	12	12	0	0	3.857142857
SSA	0	0	3	0	0	0	0	0	12	0	0	0	0	0	1.071428571
NEU	0	1	0	0	0	0	0	1	10	1	12	0	1	0	1.857142857
WCE	0	0	0	0	0	0	0	0	12	0	12	0	0	0	1.714285714
EEU	0	2	0	0	0	0	0	0	12	0	12	12	0	4	3
MED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SAH	8	12	0	0	0	0	12	12	0	12	0	0	12	0	4.857142857
WAF	4	2	0	0	0	0	12	12	5	5	0	0	12	0	3.714285714
CAF	0	0	0	0	0	0	6	6	0	7	0	0	12	0	2.214285714
NEAF	10	0	12	12	0	0	0	3	12	2	12	11	3	0	5.5
SEAF	0	0	1	5	0	0	0	0	0	1	0	0	0	0	0.5
WSAF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ESAF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MDG	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0.642857143
RAR	0	0	12	12	0	0	0	11	12	0	1	0	0	0	3.428571429
WSB	0	5	0	8	0	0	3	3	12	1	0	12	0	1	3.214285714
ESB	0	5	0	0	0	0	1	8	0	1	3	0	0	0	1.285714286
RFE	0	2	12	9	0	0	0	1	10	0	0	0	0	0	2.428571429
WCA	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0.142857143
ECA	12	0	0	0	0	0	8	0	0	0	12	12	0	0	3.142857143
TIB	0	0	7	7	0	0	9	11	12	0	0	0	2	0	3.428571429
EAS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ARP	12	4	12	12	0	0	12	12	0	7	0	0	11	0	5.857142857
SAS	0	0	11	7	0	0	7	0	0	0	11	0	10	0	3.285714286
SEA	0	0	0	0	0	0	0	0	0	0	0	12	2	0	1
NAU	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0.142857143
CAU	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0.642857143
EAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NZ	0	0	0	0	0	0	0	0	12	1	0	2	0	0	1.071428571
EAN	10	0	12	12	12	12	0	0	0	0	0	0	0	0	
WAN	12	0	12	12	12	9	0	0	0	0	0	0	0	0	

Table S12. As in S10, but for the SSP3-7.0 scenario.

Regions	ACCESS-CM2	CanESM5	CESM2	CESM2-WACCM	CNRM-CM6-1	CNRM-ESM2-1	EC-Earth3	EC-Earth3-Veg	GFDL-ESM4	IPSL-CM6A-LR	MIROC6	MIROC-ES2L	MPI-ESM1-2-HR	UKESM1-0-LL	Ensemble Mean
GIC	5	0	12	12	5	2	0	0	8	0	5	0	1	0	
NWN	0	0	12	12	0	0	4	0	12	2	0	9	6	0	4.071428571
NEN	0	0	12	12	0	0	0	0	10	2	0	10	0	0	3.285714286
WNA	0	0	0	0	0	0	0	0	12	0	0	0	6	1	1.357142857
CNA	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0.857142857
ENA	0	0	3	0	0	0	0	0	6	2	0	0	0	0	0.785714286
NCA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SCA	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0.428571429
CAR	0	0	0	0	0	0	0	0	0	0	11	12	0	0	1.642857143
NWS	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0.857142857
NSA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NES	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.071428571
SAM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SES	1	0	11	11	2	0	0	0	12	0	12	12	0	0	4.357142857
SSA	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0.857142857
NEU	0	2	0	1	0	0	2	5	12	3	12	0	0	1	2.714285714
WCE	0	0	0	0	0	0	0	0	7	0	12	0	0	0	1.357142857
EEU	0	4	0	0	0	0	0	2	12	3	12	12	3	3	3.642857143
MED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SAH	0	12	12	0	0	8	12	12	0	12	12	11	12	0	7.357142857
WAF	5	4	5	0	4	0	12	12	6	7	0	0	12	4	5.071428571
CAF	11	1	5	1	2	0	4	8	0	12	4	0	12	1	4.357142857
NEAF	12	4	12	12	0	0	1	5	12	9	12	10	12	12	8.071428571
SEAF	4	4	7	6	0	0	0	0	12	5	0	0	12	7	4.071428571
WSAF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ESAF	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0.5
MDG	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0.857142857
RAR	0	0	12	12	0	0	9	11	12	1	0	0	6	0	4.5
WSB	0	7	0	0	0	0	2	7	12	3	12	12	3	3	4.357142857
ESB	0	5	0	1	0	0	2	8	0	0	12	0	0	0	2
RFE	0	2	12	12	0	0	1	7	12	0	0	0	0	0	3.285714286
WCA	0	0	0	0	0	0	0	2	0	0	12	7	5	0	1.857142857
ECA	12	0	10	0	0	0	11	1	0	4	12	12	0	2	4.571428571
TIB	0	0	10	10	0	0	0	0	9	0	0	0	5	0	2.428571429
EAS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ARP	0	6	12	12	0	0	12	12	0	12	12	0	12	0	6.428571429
SAS	5	1	12	12	3	0	0	0	3	0	12	0	12	0	4.285714286
SEA	0	0	0	0	1	0	0	0	0	0	0	12	9	0	1.571428571
NAU	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0.357142857
CAU	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0.857142857
EAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NZ	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0.857142857
EAN	11	0	12	12	12	12	0	0	0	0	0	0	0	0	
WAN	12	0	12	12	12	10	0	0	0	0	0	0	0	0	

Table S13. As in S10, but for the SSP5-8.5 scenario.

Regions	ACCESS-CM2	CanESM5	CESM2	CESM2-WACCM	CNRM-CM6-1	CNRM-ESM2-1	EC-Earth3	EC-Earth3-Veg	GFDL-ESM4	IPSL-CM6A-LR	MIROC6	MIROC-ES2L	MPI-ESM1-2-HR	UKESM1-0-LL	Ensemble Mean
GIC	5	0	12	12	4	0	0	0	8	0	5	0	6	0	
NWN	0	0	12	12	0	0	5	3	12	5	7	12	6	0	5.285714286
NEN	0	0	12	12	0	0	1	0	0	5	3	12	0	0	3.214285714
WNA	0	0	0	0	1	0	0	0	12	0	3	0	2	3	1.5
CNA	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.071428571
ENA	0	0	4	4	0	0	0	0	0	0	0	0	1	3	0.857142857
NCA	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.071428571
SCA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CAR	0	0	0	0	0	0	0	0	0	0	12	12	0	0	1.714285714
NWS	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0.428571429
NSA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NES	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0.285714286
SAM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SES	9	0	12	12	0	0	0	0	12	0	12	12	0	4	5.214285714
SSA	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0.857142857
NEU	0	1	2	4	0	0	1	3	12	5	12	7	3	2	3.714285714
WCE	0	0	0	0	0	0	0	0	12	0	10	6	0	0	2
EEU	0	2	0	0	0	0	2	2	12	4	12	12	0	5	3.642857143
MED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SAH	0	12	6	2	0	0	12	12	0	12	12	12	12	0	6.571428571
WAF	0	7	0	0	4	0	12	12	5	5	0	0	12	4	4.357142857
CAF	11	0	0	4	4	0	8	10	1	12	4	0	12	6	5.142857143
NEAF	12	6	12	12	3	0	4	12	12	12	12	12	12	11	9.428571429
SEAF	10	5	12	12	0	0	9	12	0	7	0	3	12	7	6.357142857
WSAF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ESAF	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0.142857143
MDG	0	0	0	0	0	0	0	0	6	0	0	0	12	0	1.285714286
RAR	0	0	12	12	0	0	9	9	12	3	7	0	7	0	5.071428571
WSB	0	4	2	1	0	0	3	8	12	6	12	12	1	7	4.857142857
ESB	0	2	5	12	0	0	2	5	0	2	12	0	2	0	3
RFE	0	0	10	12	0	0	5	7	12	0	0	0	5	0	3.642857143
WCA	11	0	0	0	0	0	0	0	0	0	0	0	6	6	1.642857143
ECA	12	0	9	4	0	0	9	0	0	11	12	12	0	4	5.214285714
TIB	0	0	10	12	0	0	0	0	2	0	0	0	9	0	2.357142857
EAS	0	0	1	0	0	0	0	0	0	1	0	0	11	0	0.928571429
ARP	12	12	12	12	0	0	12	12	0	12	12	12	12	0	8.571428571
SAS	0	0	12	12	0	0	1	6	12	0	12	0	12	2	4.928571429
SEA	0	0	0	0	5	0	0	0	0	0	0	12	12	0	2.071428571
NAU	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0.357142857
CAU	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0.857142857
EAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NZ	0	0	0	0	0	0	0	0	5	0	0	1	0	0	0.428571429
EAN	12	0	12	12	12	12	0	0	0	0	0	0	0	0	
WAN	12	0	12	12	12	7	0	0	0	0	0	0	0	0	

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