

Table 3.SM.2: 3.4.3 Terrestrial and wetland ecosystems

Risk	Region	Metric (Unit)	Baseline Time Period against Which Change Measured	Socio-Economic Scenario and Date	Baseline Global T	Climate Scenario	Transient (T) or Equilibrium (E)	Overshoot Scenario?	Dynamic Model?	Projected Impact at 1.5°C above Pre-Industrial	Projected Impact at 2°C above Pre-Industrial	Projected Impact at Delta T(°C)	Level of Risk after Adaptation at 1.5°C	Level of Risk after Adaptation at 2°C	Type of Adaptation Modelled	Reference
Biome shift to north and to higher elevation	Global	%	1980–2010	Present day population	0.7°C	4 RCP	T	No	Y	1°C above baseline: 3 to 8 %	2°C above baseline: 5 to 19%	4°C above baseline: 35%	N/A	N/A	N/A	Warszawski et al. (2013)
Biomass loss (tropical forest to savanna/grassland)	Central America	kg m <sup>-2</sup>	1961–1990	0.5°C	1°C	HadGEM2-ES, RCP4.5, 2071-2100	T	No	Y	For 2050, biomass decrease to 6.5 kg/m2	N/A	Local warming of 2 to 4°C (NDC): -4 kg m <sup>-2</sup> (from 7 to 3 kg m <sup>-2</sup> )	N/A	N/A	N/A	Lyra et al. (2017)
Phenological shifts for primary producers (PP), primary consumers (PC), secondary consumers (SC)	UK	Days	1961–1990	N/A	-	UKCP09 projections in 2050	T	-	Y	(Low emission scenario) PP: -2.2 (-1 to -3) / PC: -5 (-2.5 to -7.5) / SC: -2 (-1 to -3)	(Medium emission scenario) PP: -2.3 (-1.2 to -4) / PC: -6 (-3.5 to -8.5) / SC: -2.1 (-1 to -3)	-	N/A	N/A	N/A	Thackeray et al. (2016)
Loss of 50% or more of their climate range	Globe	%	2100 (A1B), no mitigation	-	Pre-industrial	SRES all scenarios are +2°C or more	T	-	Y	-	-	-	N/A	N/A	N/A	Warren et al. (2013)
Loss of 50% or more of their climate range for insects	Globe	%	Not provided	N/A	Pre-industrial	21 CMIP5 models	T	No	N	9% (4–24%)	25% (10–44%)	-	6% (1–18%)	18% (6–35%)	Dispersal	Warren et al. 2018a
Loss of 50% or more of their climate range for vertebrates	Globe	%	Not provided	N/A	Pre-industrial	21 CMIP5 models	T	No	N	5% (3–11%)	10% (6–24%)	-	4% (2–9%)	8% (4–16%)	Dispersal	Warren et al. 2018a
Loss of 50% or more of their climate range for plants	Globe	%	Not provided	N/A	Pre-industrial	21 CMIP5 models	T	No	N	8% (4–15%)	16% (9–28%)	-	8% (4–15%)	16% (9–28%)	Dispersal	Warren et al. 2018a
% of globe identified as climatic refugia for the different taxa (plants/animals)	Global	%	-	-	-	7 CMIP5 models, AVOID2 scenario	T	Y	Y	An additional 4–15% acts as a refugium	-	-	N/A	N/A	N/A	Smith et al. (2018)
Loss of 50% or more of their climate range for plants	Global	%	-	-	-	21 CMIP5 models	-	-	-	Significant reduction	-	-	N/A	N/A	N/A	Smith et al. (2018)
Increase of potential habitat of bamboo	Japan	%	pre-industrial	N/A	Pre-industrial	MRI AGCM CMIP5RCP8.5 at 2027 and 2041	T	No	Y	+11–13%	+16–19%	2°C–1.5°C = 6%	N/A	N/A	N/A	Takano et al. (2017)
Carbon storage in vegetation (GPP) and soil	Europe	%	pre-industrial	-	1881–1910	Euro-Cordex with RCP4.5, 2034-2063	T	No	Y	N/A	+5% in soil and +20% in GPP	-	N/A	N/A	N/A	Sakalli et al. (2017)
Area of cryogenic land surface processes (nitration, cryoturbation, gelifluction, permafrost)	Northern Europe	%	1981–2010	-	-	CMIP5 ensemble RCP2.6, RCP4.5, RCP8.5	T	-	Y	RCP2.6, 2040–69: -19% (maximum of the 4 processes)	RCP2.6 2070–99: -19% (max)	0%	-	-	-	Aalto et al. (2017)
Spring events in temperate forests (oak)	UK	Days	1961–1990	-	0.5°C	SRES (A1F1) near term (2010–2039) and medium term (2040–2069)	T	-	Y	-14.3 days	-24.6 days	2°C–1.5°C = 10.3 days	-	-	-	Roberts et al. (2015)
Starting date of growing season	Northern China	Days	1961–1990	-	0.5°C	HadGEM3- RA: RCP4.5 and 8.5 (2050)	-	-	-	-6.5 days (s.d.=4.8 days)	-7.4 days (s.d.=4.8 days)	2°C–1.5°C = 0.9 days	-	-	-	Luo et al. (2014)
Ecosystem NPP and GPP	Europe	%	1971–2000	N/A	0.46°C	Euro-Cordex / IMPACT2C / 3 RCP	T	No	Y	N/A	N/A	2°C–1.5°C = 6 to 10% according to regions	N/A	N/A	N/A	Jacob et al. (2018)
Permafrost area	Globe	km <sup>2</sup>	1960–1990	-	0.5°C	CMIP5	T	No	Y	11 millions km <sup>2</sup> (present = 15)	9 millions km <sup>2</sup> (present = 15)	2 millions km <sup>2</sup> (1.55 to 2.5)	N/A	N/A	N/A	Chadburn et al. (2017)
	-	-	-	-	-	CMIP3 SRES A2	-	-	-	-	-	-	-	-	-	Meehl et al. (2007)
Forest biomass	Central America	%	1961–1990	-	-	Eta-HadGEM2	T	-	Y	-20%	-30%	10%	-	-	-	Lyra et al. (2017)
Fynbos biome area	South Africa	%	1961–1990	-	0.5°C above pre-industrial	Regional CCAM os 6 GCM, SRES A2	T	-	Y	-20%	-32% (average between 1°C and 2°C)	12%	-	-	-	Engelbrecht and Engelbrecht (2016)