

AR6 chapter 2, Supplemental Table 2.S.3: Projected vulnerabilities and risks of ecosystems to biome shifts from spatial analyses of vegetation biogeography, in order by type of analysis, analysis area, and projected change in temperature. This table updates the assessment in Betts (Betts et al., 2015). Gonzalez (Gonzalez et al., 2010a) and Eigenbrod (Eigenbrod et al., 2015) conducted analyses on equal-area spatial data; others did not analyse pixels of equal area. Authors generally reported biome change estimates directly as a fraction of land area; for authors that did not directly report the biome change, changes are estimates from authors' maps and are indicated by a tilde (~). Authors generally analysed changes from ~1990 to 2100, except for Heubes (2011) and Li (Li et al., 2018a), who projected changes from 2000 to 2050, and Aleman (Aleman et al., 2017) and Rasquinha and Sankaran (Rasquinha and Sankaran, 2016), who projected changes from 2000 to 2070.

Area	ΔT (°C)	Emissions scenario	Biome change, fraction of area (%)	Number of biomes	Number of GCMs	Biome shift criterion	Spatial resolution (km)	Vegetation model	Reference
Dynamic global vegetation models									
World	1	RCP2.6	~4	5–14	3	risk >0.3	~50	Hybrid, JeDi, JULES, LPJmL, ORCHID EE, SGVM, VISIT	(Warszawski et al., 2013)
World	1.5	1.5° C	~5	2	16	P >0.80	~150	LPJ	(Scholze et al., 2006)
World	≤2	B1	7	8	12	change >30%	~50	LPJ	(Park et al., 2015)
World	2.4	B1	10	13	3	confidence >0.8	50	MC1	(Gonzalez et al., 2010b)
World	2.5	+2–3° C	~5	2	16	P >0.80	~150	LPJ	(Scholze et al., 2006)
World	2	RCP4.5	13	5–14	3	risk >0.3	~50	Hybrid, JeDi, JULES, LPJmL, ORCHID EE, SGVM, VISIT	(Warszawski et al., 2013)
World	3	RCP6.0	28	5–14	3	risk >0.3	~50	Hybrid, JeDi, JULES, LPJmL, ORCHID EE,	(Warszawski et al., 2013)

								SGVM, VISIT	
World	2.5– 3.5	A1B	10	8	18	change >30%	~50	LPJ	(Park et al., 2015)
World	3.4	A1B	13	13	3	confidence >0.8	50	MC1	(Gonzalez et al., 2010b)
World	3.5	3.5°C	~5	2	16	P >0.80	~150	LPJ	(Scholze et al., 2006)
World	≥3.5	A2	13	8	18	change >30%	~50	LPJ	(Park et al., 2015)
World	4	A2	16	13	3	confidence >0.8	50	MC1	(Gonzalez et al., 2010b)
World	3.1– 4.7	historical climate and B1, A1B, A2	12	13	3	confidence >0.8	50	MC1	(Gonzalez et al., 2010b)
World	~3.5 –5.5	A1B	~10–30	5	8	range of GCMs	~280	CLM	(Alo and Wang, 2008)
World	4	RCP8.5	35	5–14	3	risk >0.3	~50	Hybrid, JeDi, JULES, LPJmL, ORCHID EE, SGVM, VISIT	(Warszawski et al., 2013)
World	4.6	A1FI	~10	2	1	change >50%	~250– 375	HyLand	(Sitch et al., 2008)
World	4.6	A1FI	~20	2	1	change >50%	~250– 375	LPJ	(Sitch et al., 2008)
World	4.6	A1FI	~10	2	1	change >50%	~250 x 375	ORCHID EE	(Sitch et al., 2008)
World	4.6	A1FI	~15	2	1	change >50%	~250 x 375	TRIFFID	(Sitch et al., 2008)

Africa	-	A1B	~26	5	1	change in one GCM	~30	aDGVM	(Scheiter and Higgins, 2009)
Asia - Qinghai-Tibetan Plateau	1.5	RCP4.5	55	19	1	change in one GCM	~50	LPJ	{Gao, 2016, Climate change and}
Asia - Qinghai-Tibetan Plateau	4.2	RCP8.5	70	19	1	change in one GCM	~50	LPJ	{Gao, 2016, Climate change and}
Asia - Siberia	2	+2.6°C after 130y	~5	2	-	change >50% of area	372 sites	FAREAS T	(Shuman et al., 2011)
Europe	2.9–4.9	A2	~30–40	13	2	change in one GCM	~12 x 18	LPJ-GUESS	(Hickler et al., 2012)
South America - Amazon	2	A2	~30	2	1	change in one GCM	~250 x 375	HadCM3LC	(Jones et al., 2009)
South America - Amazon	~3	RCP4.5	~50	15	1	change in one GCM	~190 x 125	Inland	(Lyra et al., 2016)
South America - Amazon	~6	RCP8.5	~80	15	1	change in one GCM	~190 x 125	Inland	(Lyra et al., 2016)

Equilibrium models

World	1	RCP2.6	10	14	10	vulnerability index >0.7	~10	vulnerability index	(Li et al., 2018a)
World	1.8	RCP4.5	12	14	10	vulnerability index >0.7	~10	vulnerability index	(Li et al., 2018a)
World	3.7	RCP8.5	15	14	10	vulnerability index >0.7	~10	vulnerability index	(Li et al., 2018a)

World	2–4	A1B	37	5	10	average of GCMs	~100	EVE	(Bergengren et al., 2011)
Africa - South		A1B	50	7	1	change in one GCM	~20	aDGVM	(Moncrieff et al., 2015)
Africa - West		A2	~50	5	17	weighted average of GCMs	~10	GAM	(Heubes et al., 2011)
Asia - India	3	+3°C, +15% precipitation	~25	7	1	change in one scenario	1	Minimum distance supervised classification	(Chakraborty et al., 2013)
Asia - India		RCP4.5	14	11	19	agreement >0.75	~10	RF	(Rasquinha and Sankaran, 2016)
Asia - India		RCP8.5	18	11	17	agreement >0.75	~10	RF	(Rasquinha and Sankaran, 2016)
North America - Northwest		Historical climate and A2	50–57	33	2	change in one GCM	~1	Rehfeldt	(Langdon and Lawler, 2015)
North America - Yukon	3.9–6.9	A2	50	25	5	two projected changes in biome	~18	SNAP-EWHALE	(Rowland et al., 2016)
South America		A2	~5–40	13	14	confidence >0.75	~170	CPTEC-PVM2	(Lapola et al., 2009)
Tropical forests	2	+2°C	<5	2	16	P >0.80	~100	MWCD	(Zelazowski et al., 2011)
Tropical forests	4	+4°C	~5	2	16	P >0.80	~100	MWCD	(Zelazowski et al., 2011)

Combined climate change and land use change

World	1	RCP2.6	22	9		risk >0.3	~50	LPJmL	(Ostberg et al., 2018)
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World	1.8	RCP4.5	34	9		risk >0.3	~50	LPJmL	(Ostberg et al., 2018)
World	2.2	RCP6.0	41	9		risk >0.3	~50	LPJmL	(Ostberg et al., 2018)
World	3.7	RCP8.5	54	9		risk >0.3	~50	LPJmL	(Ostberg et al., 2018)
World	3.1–4.7	historical climate and B1, A1B, A2	48	13		confidence >0.8	48	MC1	(Eigenbrod et al., 2015)
Latin America	1	RCP2.6	8–14	9	5	average of GCMs	~50	LPJmL	(Boit et al., 2016)
Latin America	3.7	RCP8.5	10–15	9	5	average of GCMs	~50	LPJmL	(Boit et al., 2016)
