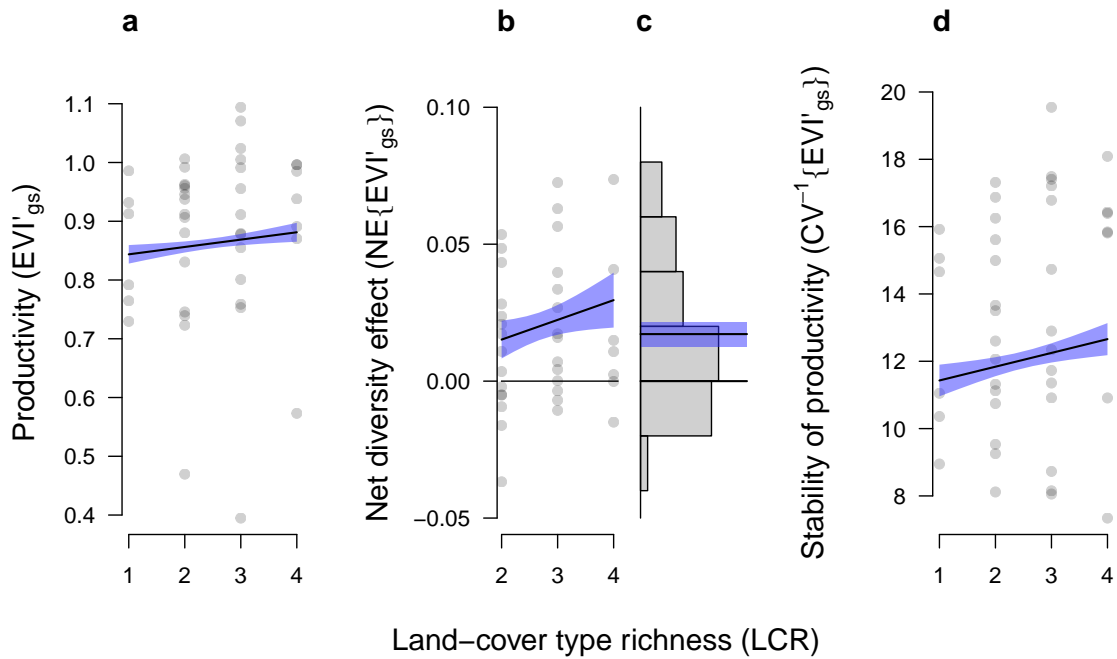


# Supplementary Information

Landscape diversity promotes landscape functioning in North America

Sarah Mayor, Florian Altermatt, Tom W. Crowther, Iris Hordijk, Simon Landauer, Jacqueline Oehri, Merin Reji Chacko, Michael E. Schaepman, Bernhard Schmid, Pascal A. Niklaus

## 1 Supplementary Figures



**Figure S1.** Land-cover type richness effects determined using the Globeland30 land-cover map instead of the Cooperation's North American Land Monitoring System's (CEC) land-cover map. Otherwise, this figure corresponds to Figure 3 in the Main Text. See Supplementary Table S2 for corresponding statistical significance tests.

Land-cover-type richness (LCR) effect on (a) normalized growing-season-integrated productivity ( $EVI'_{gs}$ ), (b) the net diversity effect (NE) calculated as the difference between observed and expected  $EVI'_{gs}$  in mixed landscapes, with (c) the distribution of the NEEVI'\_{gs} values of each LC type compositions shown as histogram, and (d) inverse coefficient of inter-annual variation of  $EVI'_{gs}$  ( $CV^{-1}_{EVI'_{gs}}$ ). Black lines and areas shaded in blue: model-predicted mean  $\pm$  s.e.m.; dots: averages for each land cover composition.

## 2 Supplementary Tables

**Table S1.** Blocks, maximum land-cover type richness in the block ( $LCR_{max}$ ), number of different land-cover types in the block ( $n_{LCC}$ ), and the specific land-cover compositions (LCC) grouped by LCR. Land-cover types are A: agriculture, F: forest, G: grassland, S: shrubland, U: urban, W: wetland; blocks are named according to their longitude (X000: 0–6°W, X001: 6–12°W etc) and latitude (Y000: 90–87°S, ... Y030: 0–3°N, Y031: 3–6°N etc) and ecoregion (E02: cold and mesic E03: cold and wet E04: cool temperate and dry E05: cool temperate and moist E06: cool temperate and xeric E07: extremely cold and mesic E09: extremely hot and arid E10: extremely hot and moist E11: extremely hot and xeric, E12: hot and arid, E13: hot and dry, E14: hot and mesic, E15: warm temperate and mesic, E16: warm temperate and xeric).

Block	$LCR_{max}$	$n_{LCC}$	LCC
X036-Y050-E07	2	3	(F, S) (FS)
X037-Y049-E02	2	3	(F, S) (FS)
X037-Y049-E03	2	3	(F, S) (FS)
X037-Y049-E07	2	3	(F, S) (FS)
X037-Y050-E02	3	7	(F, G, S) (FG, FS, GS) (FGS)
X037-Y050-E07	3	7	(F, G, S) (FG, FS, GS) (FGS)
X038-Y047-E03	2	3	(F, S) (FS)
X038-Y047-E07	2	3	(F, S) (FS)
X038-Y048-E03	2	3	(F, S) (FS)
X038-Y048-E07	2	3	(F, S) (FS)
X038-Y049-E02	3	7	(F, G, S) (FG, FS, GS) (FGS)
X038-Y049-E07	3	7	(F, G, S) (FG, FS, GS) (FGS)
X038-Y050-E02	3	7	(F, G, S) (FG, FS, GS) (FGS)
X038-Y050-E07	3	7	(F, G, S) (FG, FS, GS) (FGS)
X038-Y051-E07	3	7	(F, G, S) (FG, FS, GS) (FGS)
X039-Y041-E15	4	15	(F, G, S, U) (FG, FS, FU, GS, GU, SU) (FGS, FGU, FSU, GSU) (FGSU)
X039-Y041-E16	3	7	(A, G, U) (AG, AU, GU) (AGU)
X039-Y043-E02	2	3	(F, S) (FS)
X039-Y043-E04	4	11	(F, G, S, U) (FG, FS, FU, GS, GU, SU) () (FGSU)
X039-Y043-E05	3	7	(F, G, S) (FG, FS, GS) (FGS)
X039-Y043-E06	3	7	(A, G, S) (AG, AS, GS) (AGS)
X039-Y043-E15	4	15	(F, G, S, U) (FG, FS, FU, GS, GU, SU) (FGS, FGU, FSU, GSU) (FGSU)
X039-Y043-E16	3	7	(A, G, U) (AG, AU, GU) (AGU)
X039-Y044-E02	3	7	(F, G, S) (FG, FS, GS) (FGS)
X039-Y044-E03	3	7	(F, G, S) (FG, FS, GS) (FGS)
X039-Y044-E04	4	11	(F, G, S, W) (FG, FS, FW, GS, GW, SW) () (FGSW)
X039-Y044-E05	3	7	(A, F, U) (AF, AU, FU) (AFU)
X039-Y044-E06	3	7	(A, S, U) (AS, AU, SU) (ASU)
X039-Y044-E15	3	7	(A, F, U) (AF, AU, FU) (AFU)
X039-Y045-E02	3	7	(F, G, S) (FG, FS, GS) (FGS)

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**Table S1**, continued

Block	LCR <sub>max</sub>	n <sub>LCC</sub>	LCC
X039-Y045-E03	3	7	(F, G, S) (FG, FS, GS) (FGS)
X039-Y045-E04	3	7	(F, G, S) (FG, FS, GS) (FGS)
X039-Y045-E05	4	15	(A, F, U, W) (AF, AU, AW, FU, FW, UW) (AFU, AFW, AUW, FUW) (AFUW)
X039-Y045-E06	3	7	(A, S, U) (AS, AU, SU) (ASU)
X039-Y045-E15	3	7	(A, F, U) (AF, AU, FU) (AFU)
X039-Y046-E02	3	7	(F, G, S) (FG, FS, GS) (FGS)
X039-Y046-E03	3	7	(F, G, S) (FG, FS, GS) (FGS)
X039-Y046-E04	3	7	(F, G, S) (FG, FS, GS) (FGS)
X039-Y046-E05	4	15	(A, F, S, U) (AF, AS, AU, FS, FU, SU) (AFS, AFU, ASU, FSU) (AFSU)
X039-Y046-E07	3	7	(F, G, S) (FG, FS, GS) (FGS)
X039-Y047-E02	3	7	(F, G, S) (FG, FS, GS) (FGS)
X039-Y047-E04	2	3	(F, G) (FG)
X039-Y047-E07	3	7	(F, G, S) (FG, FS, GS) (FGS)
X039-Y048-E02	3	7	(A, F, S) (AF, AS, FS) (AFS)
X039-Y048-E07	3	7	(F, G, S) (FG, FS, GS) (FGS)
X039-Y049-E02	3	7	(F, S, W) (FS, FW, SW) (FSW)
X039-Y049-E07	3	7	(F, G, S) (FG, FS, GS) (FGS)
X039-Y050-E02	3	7	(F, S, W) (FS, FW, SW) (FSW)
X039-Y050-E07	2	3	(F, G) (FG)
X039-Y051-E02	2	3	(F, W) (FW)
X039-Y051-E07	2	3	(F, G) (FG)
X040-Y039-E13	3	7	(A, G, S) (AG, AS, GS) (AGS)
X040-Y040-E12	3	7	(A, S, U) (AS, AU, SU) (ASU)
X040-Y040-E15	3	7	(F, G, S) (FG, FS, GS) (FGS)
X040-Y040-E16	3	7	(G, S, U) (GS, GU, SU) (GSU)
X040-Y041-E12	2	3	(S, U) (SU)
X040-Y041-E13	2	3	(S, U) (SU)
X040-Y041-E15	2	3	(G, S) (GS)
X040-Y041-E16	4	15	(A, G, S, U) (AG, AS, AU, GS, GU, SU) (AGS, AGU, ASU, GSU) (AGSU)
X040-Y042-E04	3	7	(F, G, S) (FG, FS, GS) (FGS)
X040-Y042-E06	3	7	(F, G, S) (FG, FS, GS) (FGS)
X040-Y042-E13	2	3	(S, U) (SU)
X040-Y042-E15	3	7	(F, G, S) (FG, FS, GS) (FGS)
X040-Y042-E16	3	7	(A, G, U) (AG, AU, GU) (AGU)
X040-Y043-E04	3	7	(A, S, W) (AS, AW, SW) (ASW)
X040-Y043-E06	3	7	(A, S, W) (AS, AW, SW) (ASW)
X040-Y044-E02	3	7	(F, G, S) (FG, FS, GS) (FGS)
X040-Y044-E04	4	15	(A, G, S, U) (AG, AS, AU, GS, GU, SU) (AGS, AGU, ASU, GSU) (AGSU)

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**Table S1**, continued

Block	LCR <sub>max</sub>	n <sub>LCC</sub>	LCC
X040-Y044-E06	4	15	(A, G, S, U) (AG, AS, AU, GS, GU, SU) (AGS, AGU, ASU, GSU) (AGSU)
X040-Y045-E02	3	7	(F, G, S) (FG, FS, GS) (FGS)
X040-Y045-E04	4	30	(A, F, G, S, U) (AF, AG, AS, AU, FG, FS, FU, GS, GU, SU) (AFG, AFS, AFU, AGS, AGU, ASU, FGS, FGU, FSU, GSU) (AFGS, AFGU, AFSU, AGSU, FGSU)
X040-Y045-E06	4	15	(A, G, S, U) (AG, AS, AU, GS, GU, SU) (AGS, AGU, ASU, GSU) (AGSU)
X040-Y046-E02	3	7	(F, G, S) (FG, FS, GS) (FGS)
X040-Y046-E04	4	30	(A, F, G, S, U) (AF, AG, AS, AU, FG, FS, FU, GS, GU, SU) (AFG, AFS, AFU, AGS, AGU, ASU, FGS, FGU, FSU, GSU) (AFGS, AFGU, AFSU, AGSU, FGSU)
X040-Y046-E06	3	7	(A, S, U) (AS, AU, SU) (ASU)
X040-Y046-E07	2	3	(F, G) (FG)
X040-Y047-E02	3	14	(A, F, G, U) (AF, AG, AU, FG, FU, GU) (AFG, AFU, AGU, FGU)
X040-Y047-E07	2	3	(F, G) (FG)
X040-Y048-E02	3	7	(A, F, U) (AF, AU, FU) (AFU)
X040-Y049-E02	3	7	(F, S, W) (FS, FW, SW) (FSW)
X040-Y050-E02	3	7	(F, S, W) (FS, FW, SW) (FSW)
X040-Y051-E02	2	3	(F, W) (FW)
X041-Y037-E14	2	6	(F, G, S) (FG, FS, GS)
X041-Y038-E09	3	7	(A, G, S) (AG, AS, GS) (AGS)
X041-Y038-E10	2	6	(A, F, S) (AF, AS, FS)
X041-Y038-E12	3	7	(A, G, S) (AG, AS, GS) (AGS)
X041-Y038-E13	2	6	(F, G, S) (FG, FS, GS)
X041-Y038-E14	2	6	(A, F, S) (AF, AS, FS)
X041-Y039-E09	3	14	(A, F, G, S) (AF, AG, AS, FG, FS, GS) (AFG, AFS, AGS, FGS)
X041-Y039-E12	3	7	(F, G, S) (FG, FS, GS) (FGS)
X041-Y039-E13	3	7	(F, G, S) (FG, FS, GS) (FGS)
X041-Y039-E14	3	7	(A, F, G) (AF, AG, FG) (AFG)
X041-Y039-E16	3	7	(F, G, S) (FG, FS, GS) (FGS)
X041-Y040-E06	3	7	(F, G, S) (FG, FS, GS) (FGS)
X041-Y040-E12	3	7	(A, S, U) (AS, AU, SU) (ASU)
X041-Y040-E13	3	7	(F, G, S) (FG, FS, GS) (FGS)
X041-Y040-E15	3	7	(F, G, S) (FG, FS, GS) (FGS)
X041-Y040-E16	4	11	(A, G, S, U) (AG, AS, AU, GS, GU, SU) ( ) (AGSU)
X041-Y041-E06	3	7	(F, G, S) (FG, FS, GS) (FGS)
X041-Y041-E12	3	7	(A, S, U) (AS, AU, SU) (ASU)
X041-Y041-E13	3	7	(A, S, U) (AS, AU, SU) (ASU)
X041-Y041-E15	3	7	(F, S, U) (FS, FU, SU) (FSU)
X041-Y042-E04	3	7	(A, F, S) (AF, AS, FS) (AFS)
X041-Y042-E06	2	3	(G, S) (GS)

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**Table S1**, continued

Block	LCR <sub>max</sub>	n <sub>LCC</sub>	LCC
X041-Y042-E15	2	3	(G, S) (GS)
X041-Y042-E16	2	3	(G, S) (GS)
X041-Y043-E04	4	11	(A, F, S, U) (AF, AS, AU, FS, FU, SU) () (AFSU)
X041-Y043-E06	4	15	(A, G, S, U) (AG, AS, AU, GS, GU, SU) (AGS, AGU, ASU, GSU) (AGSU)
X041-Y044-E02	3	7	(F, S, W) (FS, FW, SW) (FSW)
X041-Y044-E04	4	15	(A, G, S, U) (AG, AS, AU, GS, GU, SU) (AGS, AGU, ASU, GSU) (AGSU)
X041-Y045-E02	3	7	(F, G, S) (FG, FS, GS) (FGS)
X041-Y045-E04	3	25	(A, F, G, S, W) (AF, AG, AS, AW, FG, FS, FW, GS, GW, SW) (AFG, AFS, AFW, AGS, AGW, ASW, FGS, FGW, FSW, GSW)
X041-Y046-E02	3	7	(F, G, S) (FG, FS, GS) (FGS)
X041-Y046-E04	4	15	(A, F, G, S) (AF, AG, AS, FG, FS, GS) (AFG, AFS, AGS, FGS) (AFGS)
X041-Y047-E02	3	7	(A, F, G) (AF, AG, FG) (AFG)
X041-Y047-E04	3	7	(A, G, U) (AG, AU, GU) (AGU)
X041-Y048-E02	3	7	(A, F, U) (AF, AU, FU) (AFU)
X041-Y049-E02	4	15	(F, G, S, W) (FG, FS, FW, GS, GW, SW) (FGS, FGW, FSW, GSW) (FGSW)
X041-Y050-E02	3	7	(F, G, S) (FG, FS, GS) (FGS)
X041-Y050-E07	2	3	(F, G) (FG)
X042-Y036-E10	3	7	(A, F, G) (AF, AG, FG) (AFG)
X042-Y036-E11	3	7	(A, F, G) (AF, AG, FG) (AFG)
X042-Y036-E13	4	15	(A, F, G, S) (AF, AG, AS, FG, FS, GS) (AFG, AFS, AGS, FGS) (AFGS)
X042-Y036-E14	3	7	(F, G, S) (FG, FS, GS) (FGS)
X042-Y036-E16	3	7	(A, F, S) (AF, AS, FS) (AFS)
X042-Y037-E10	3	7	(A, F, G) (AF, AG, FG) (AFG)
X042-Y037-E13	4	15	(A, F, G, S) (AF, AG, AS, FG, FS, GS) (AFG, AFS, AGS, FGS) (AFGS)
X042-Y037-E14	3	7	(A, F, G) (AF, AG, FG) (AFG)
X042-Y037-E16	3	7	(A, G, S) (AG, AS, GS) (AGS)
X042-Y038-E10	2	6	(A, F, S) (AF, AS, FS)
X042-Y038-E12	3	7	(A, G, S) (AG, AS, GS) (AGS)
X042-Y038-E13	3	7	(A, G, S) (AG, AS, GS) (AGS)
X042-Y038-E14	2	6	(A, F, S) (AF, AS, FS)
X042-Y038-E16	3	7	(A, G, S) (AG, AS, GS) (AGS)
X042-Y039-E15	2	6	(F, G, S) (FG, FS, GS)
X042-Y039-E16	3	7	(A, G, S) (AG, AS, GS) (AGS)
X042-Y040-E15	3	7	(F, G, S) (FG, FS, GS) (FGS)
X042-Y040-E16	4	15	(A, G, S, U) (AG, AS, AU, GS, GU, SU) (AGS, AGU, ASU, GSU) (AGSU)

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**Table S1**, continued

Block	LCR <sub>max</sub>	n <sub>LCC</sub>	LCC
X042-Y041-E06	3	7	(G, S, U) (GS, GU, SU) (GSU)
X042-Y041-E15	4	15	(A, G, S, U) (AG, AS, AU, GS, GU, SU) (AGS, AGU, ASU, GSU) (AGSU)
X042-Y041-E16	3	7	(A, S, U) (AS, AU, SU) (ASU)
X042-Y042-E04	3	7	(A, F, S) (AF, AS, FS) (AFS)
X042-Y042-E06	4	15	(A, G, S, U) (AG, AS, AU, GS, GU, SU) (AGS, AGU, ASU, GSU) (AGSU)
X042-Y042-E15	3	7	(A, G, S) (AG, AS, GS) (AGS)
X042-Y043-E04	3	14	(A, G, S, U) (AG, AS, AU, GS, GU, SU) (AGS, AGU, ASU, GSU)
X042-Y043-E06	4	15	(A, G, U, W) (AG, AU, AW, GU, GW, UW) (AGU, AGW, AUW, GUW) (AGUW)
X042-Y044-E04	4	15	(A, G, S, W) (AG, AS, AW, GS, GW, SW) (AGS, AGW, ASW, GSW) (AGSW)
X042-Y044-E06	3	7	(A, G, U) (AG, AU, GU) (AGU)
X042-Y045-E04	4	15	(F, G, S, W) (FG, FS, FW, GS, GW, SW) (FGS, FGW, FSW, GSW) (FGSW)
X042-Y045-E06	3	7	(A, G, W) (AG, AW, GW) (AGW)
X042-Y046-E04	3	7	(A, G, W) (AG, AW, GW) (AGW)
X042-Y047-E02	4	15	(A, F, S, W) (AF, AS, AW, FS, FW, SW) (AFS, AFW, ASW, FSW) (AFSW)
X042-Y047-E04	4	15	(A, F, G, S) (AF, AG, AS, FG, FS, GS) (AFG, AFS, AGS, FGS) (AFGS)
X042-Y048-E02	4	15	(F, G, S, W) (FG, FS, FW, GS, GW, SW) (FGS, FGW, FSW, GSW) (FGSW)
X042-Y049-E02	4	15	(F, G, S, W) (FG, FS, FW, GS, GW, SW) (FGS, FGW, FSW, GSW) (FGSW)
X042-Y049-E07	3	7	(F, G, S) (FG, FS, GS) (FGS)
X042-Y050-E02	3	7	(F, G, S) (FG, FS, GS) (FGS)
X042-Y050-E07	3	7	(F, G, S) (FG, FS, GS) (FGS)
X043-Y035-E10	3	7	(A, F, G) (AF, AG, FG) (AFG)
X043-Y035-E11	3	7	(A, F, G) (AF, AG, FG) (AFG)
X043-Y035-E13	4	15	(A, F, G, S) (AF, AG, AS, FG, FS, GS) (AFG, AFS, AGS, FGS) (AFGS)
X043-Y035-E14	3	14	(A, F, G, S) (AF, AG, AS, FG, FS, GS) (AFG, AFS, AGS, FGS)
X043-Y035-E15	3	7	(A, F, S) (AF, AS, FS) (AFS)
X043-Y035-E16	2	10	(A, F, G, S) (AF, AG, AS, FG, FS, GS)
X043-Y036-E10	3	14	(A, F, G, S) (AF, AG, AS, FG, FS, GS) (AFG, AFS, AGS, FGS)
X043-Y036-E11	3	7	(A, F, G) (AF, AG, FG) (AFG)
X043-Y036-E13	4	15	(A, F, G, S) (AF, AG, AS, FG, FS, GS) (AFG, AFS, AGS, FGS) (AFGS)
X043-Y036-E14	4	15	(A, F, G, S) (AF, AG, AS, FG, FS, GS) (AFG, AFS, AGS, FGS) (AFGS)

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**Table S1**, continued

Block	LCR <sub>max</sub>	n <sub>LCC</sub>	LCC
X043-Y036-E15	3	7	(A, F, G) (AF, AG, FG) (AFG)
X043-Y036-E16	3	7	(A, G, S) (AG, AS, GS) (AGS)
X043-Y037-E10	3	14	(A, F, G, S) (AF, AG, AS, FG, FS, GS) (AFG, AFS, AGS, FGS)
X043-Y037-E13	3	14	(A, F, G, S) (AF, AG, AS, FG, FS, GS) (AFG, AFS, AGS, FGS)
X043-Y037-E14	3	14	(A, F, G, S) (AF, AG, AS, FG, FS, GS) (AFG, AFS, AGS, FGS)
X043-Y037-E16	3	7	(A, G, S) (AG, AS, GS) (AGS)
X043-Y038-E09	3	7	(A, G, S) (AG, AS, GS) (AGS)
X043-Y038-E10	3	7	(A, G, S) (AG, AS, GS) (AGS)
X043-Y038-E12	3	7	(A, G, S) (AG, AS, GS) (AGS)
X043-Y038-E13	3	7	(A, G, S) (AG, AS, GS) (AGS)
X043-Y038-E14	4	15	(A, G, S, U) (AG, AS, AU, GS, GU, SU) (AGS, AGU, ASU, GSU) (AGSU)
X043-Y038-E16	3	7	(A, G, S) (AG, AS, GS) (AGS)
X043-Y039-E12	3	7	(A, G, S) (AG, AS, GS) (AGS)
X043-Y039-E13	4	30	(A, F, G, S, U) (AF, AG, AS, AU, FG, FS, FU, GS, GU, SU) (AFG, AFS, AFU, AGS, AGU, ASU, FGS, FGU, FSU, GSU) (AFGS, AFGU, AFSU, AGSU, FGSU)
X043-Y039-E14	4	15	(A, G, S, U) (AG, AS, AU, GS, GU, SU) (AGS, AGU, ASU, GSU) (AGSU)
X043-Y040-E13	4	30	(A, F, G, S, U) (AF, AG, AS, AU, FG, FS, FU, GS, GU, SU) (AFG, AFS, AFU, AGS, AGU, ASU, FGS, FGU, FSU, GSU) (AFGS, AFGU, AFSU, AGSU, FGSU)
X043-Y040-E16	4	15	(A, G, S, U) (AG, AS, AU, GS, GU, SU) (AGS, AGU, ASU, GSU) (AGSU)
X043-Y041-E13	4	15	(A, F, G, U) (AF, AG, AU, FG, FU, GU) (AFG, AFU, AGU, FGU) (AFGU)
X043-Y041-E15	4	15	(A, F, G, U) (AF, AG, AU, FG, FU, GU) (AFG, AFU, AGU, FGU) (AFGU)
X043-Y041-E16	4	20	(A, F, G, S, U) (AF, AG, AS, AU, FG, FS, FU, GS, GU, SU) (AFGS, AFGU, AFSU, AGSU, FGSU)
X043-Y042-E06	3	7	(A, G, U) (AG, AU, GU) (AGU)
X043-Y042-E15	4	15	(A, F, G, U) (AF, AG, AU, FG, FU, GU) (AFG, AFU, AGU, FGU) (AFGU)
X043-Y043-E05	3	7	(A, G, U) (AG, AU, GU) (AGU)
X043-Y043-E06	4	15	(A, G, U, W) (AG, AU, AW, GU, GW, UW) (AGU, AGW, AUW, GUW) (AGUW)
X043-Y043-E15	3	7	(A, G, U) (AG, AU, GU) (AGU)
X043-Y044-E04	3	7	(A, G, U) (AG, AU, GU) (AGU)
X043-Y044-E06	3	7	(A, G, W) (AG, AW, GW) (AGW)
X043-Y045-E04	4	15	(A, F, G, W) (AF, AG, AW, FG, FW, GW) (AFG, AFW, AGW, FGW) (AFGW)
X043-Y046-E02	3	7	(A, F, G) (AF, AG, FG) (AFG)

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**Table S1**, continued

Block	LCR <sub>max</sub>	n <sub>LCC</sub>	LCC
X043-Y046-E04	3	25	(A, F, G, U, W) (AF, AG, AU, AW, FG, FU, FW, GU, GW, UW) (AFG, AFU, AFW, AGU, AGW, AUW, FGU, FGW, FUW, GUW)
X043-Y047-E02	4	15	(F, G, S, W) (FG, FS, FW, GS, GW, SW) (FGS, FGW, FSW, GSW) (FGSW)
X043-Y047-E04	4	15	(A, F, G, U) (AF, AG, AU, FG, FU, GU) (AFG, AFU, AGU, FGU) (AFGU)
X043-Y048-E02	4	15	(F, G, S, W) (FG, FS, FW, GS, GW, SW) (FGS, FGW, FSW, GSW) (FGSW)
X043-Y049-E02	4	15	(F, G, S, W) (FG, FS, FW, GS, GW, SW) (FGS, FGW, FSW, GSW) (FGSW)
X043-Y049-E07	3	7	(F, G, S) (FG, FS, GS) (FGS)
X043-Y050-E07	3	7	(F, G, S) (FG, FS, GS) (FGS)
X044-Y034-E11	2	6	(A, G, W) (AG, AW, GW)
X044-Y035-E10	3	7	(A, F, G) (AF, AG, FG) (AFG)
X044-Y035-E11	3	7	(A, F, G) (AF, AG, FG) (AFG)
X044-Y035-E13	3	7	(A, F, S) (AF, AS, FS) (AFS)
X044-Y035-E14	3	14	(A, F, G, S) (AF, AG, AS, FG, FS, GS) (AFG, AFS, AGS, FGS)
X044-Y035-E15	3	7	(A, F, S) (AF, AS, FS) (AFS)
X044-Y036-E10	3	7	(A, F, G) (AF, AG, FG) (AFG)
X044-Y036-E14	2	6	(A, F, G) (AF, AG, FG)
X044-Y039-E13	2	10	(A, F, U, W) (AF, AU, AW, FU, FW, UW)
X044-Y040-E13	4	56	(A, F, G, S, U, W) (AF, AG, AS, AU, AW, FG, FS, FU, FW, GS, GU, GW, SU, SW, UW) (AFG, AFS, AFU, AFW, AGS, AGU, AGW, ASU, ASW, AUW, FGS, FGU, FGW, FSU, FSW, FUW, GSU, GSW, GUW, SUW) (AFGS, AFGU, AFGW, AFSU, AFSW, AFUW, AGSU, AGSW, AGUW, ASUW, FGSU, FGSW, FGUW, FSUW, GSUW)
X044-Y041-E13	4	15	(A, F, U, W) (AF, AU, AW, FU, FW, UW) (AFU, AFW, AUW, FUW) (AFUW)
X044-Y041-E15	4	15	(A, F, U, W) (AF, AU, AW, FU, FW, UW) (AFU, AFW, AUW, FUW) (AFUW)
X044-Y042-E15	4	15	(A, F, G, U) (AF, AG, AU, FG, FU, GU) (AFG, AFU, AGU, FGU) (AFGU)
X044-Y043-E05	4	15	(A, F, G, U) (AF, AG, AU, FG, FU, GU) (AFG, AFU, AGU, FGU) (AFGU)
X044-Y043-E15	4	15	(A, F, G, U) (AF, AG, AU, FG, FU, GU) (AFG, AFU, AGU, FGU) (AFGU)
X044-Y044-E04	4	30	(A, F, G, U, W) (AF, AG, AU, AW, FG, FU, FW, GU, GW, UW) (AFG, AFU, AFW, AGU, AGW, AUW, FGU, FGW, FUW, GUW) (AFGU, AFGW, AFUW, AGUW, FGUW)
X044-Y044-E05	4	15	(A, F, G, U) (AF, AG, AU, FG, FU, GU) (AFG, AFU, AGU, FGU) (AFGU)
X044-Y045-E02	4	11	(A, F, U, W) (AF, AU, AW, FU, FW, UW) (AFUW)

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**Table S1**, continued

Block	LCR <sub>max</sub>	n <sub>LCC</sub>	LCC
X044-Y045-E04	4	15	(A, F, U, W) (AF, AU, AW, FU, FW, UW) (AFU, AFW, AUW, FUW) (AFUW)
X044-Y046-E02	3	7	(F, S, W) (FS, FW, SW) (FSW)
X044-Y046-E04	4	15	(A, F, U, W) (AF, AU, AW, FU, FW, UW) (AFU, AFW, AUW, FUW) (AFUW)
X044-Y047-E02	4	15	(F, G, S, W) (FG, FS, FW, GS, GW, SW) (FGS, FGW, FSW, GSW) (FGSW)
X044-Y048-E02	3	7	(F, S, W) (FS, FW, SW) (FSW)
X044-Y048-E07	4	15	(F, G, S, W) (FG, FS, FW, GS, GW, SW) (FGS, FGW, FSW, GSW) (FGSW)
X044-Y049-E02	3	7	(F, S, W) (FS, FW, SW) (FSW)
X044-Y049-E07	4	15	(F, G, S, W) (FG, FS, FW, GS, GW, SW) (FGS, FGW, FSW, GSW) (FGSW)
X045-Y036-E10	3	7	(A, F, G) (AF, AG, FG) (AFG)
X045-Y036-E11	3	7	(A, F, G) (AF, AG, FG) (AFG)
X045-Y040-E13	4	30	(A, F, G, S, U) (AF, AG, AS, AU, FG, FS, FU, GS, GU, SU) (AFG, AFS, AFU, AGS, AGU, ASU, FGS, FGU, FSU, GSU) (AFGS, AFGU, AFSU, AGSU, FGSU)
X045-Y040-E15	3	7	(A, F, U) (AF, AU, FU) (AFU)
X045-Y041-E13	3	7	(A, F, W) (AF, AW, FW) (AFW)
X045-Y041-E15	4	30	(A, F, G, S, U) (AF, AG, AS, AU, FG, FS, FU, GS, GU, SU) (AFG, AFS, AFU, AGS, AGU, ASU, FGS, FGU, FSU, GSU) (AFGS, AFGU, AFSU, AGSU, FGSU)
X045-Y042-E15	4	15	(A, F, G, U) (AF, AG, AU, FG, FU, GU) (AFG, AFU, AGU, FGU) (AFGU)
X045-Y043-E04	3	7	(A, F, W) (AF, AW, FW) (AFW)
X045-Y043-E05	4	15	(A, F, U, W) (AF, AU, AW, FU, FW, UW) (AFU, AFW, AUW, FUW) (AFUW)
X045-Y043-E15	3	7	(A, F, U) (AF, AU, FU) (AFU)
X045-Y044-E04	4	30	(A, F, G, U, W) (AF, AG, AU, AW, FG, FU, FW, GU, GW, UW) (AFG, AFU, AFW, AGU, AGW, AUW, FGU, FGW, FUW, GUW) (AFGU, AFGW, AFUW, AGUW, FGUW)
X045-Y044-E05	4	15	(A, F, U, W) (AF, AU, AW, FU, FW, UW) (AFU, AFW, AUW, FUW) (AFUW)
X045-Y045-E02	4	15	(A, F, U, W) (AF, AU, AW, FU, FW, UW) (AFU, AFW, AUW, FUW) (AFUW)
X045-Y045-E04	4	15	(A, F, U, W) (AF, AU, AW, FU, FW, UW) (AFU, AFW, AUW, FUW) (AFUW)
X045-Y046-E02	4	15	(F, G, S, W) (FG, FS, FW, GS, GW, SW) (FGS, FGW, FSW, GSW) (FGSW)
X045-Y047-E02	3	7	(F, S, W) (FS, FW, SW) (FSW)
X045-Y048-E02	3	7	(F, S, W) (FS, FW, SW) (FSW)

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**Table S1**, continued

Block	LCR <sub>max</sub>	n <sub>LCC</sub>	LCC
X045-Y048-E07	3	7	(F, S, W) (FS, FW, SW) (FSW)
X046-Y039-E13	4	15	(A, F, S, U) (AF, AS, AU, FS, FU, SU) (AFS, AFU, ASU, FSU) (AFSU)
X046-Y039-E14	4	30	(A, F, S, U, W) (AF, AS, AU, AW, FS, FU, FW, SU, SW, UW) (AFS, AFU, AFW, ASU, ASW, AUW, FSU, FSW, FUW, SUW) (AFSU, AFSW, AFUW, ASUW, FSUW)
X046-Y040-E13	4	56	(A, F, G, S, U, W) (AF, AG, AS, AU, AW, FG, FS, FU, FW, GS, GU, GW, SU, SW, UW) (AFG, AFS, AFU, AFW, AGS, AGU, AGW, ASU, ASW, AUW, FGS, FGU, FGW, FSU, FSW, FUW, GSU, GSW, GUW, SUW) (AFGS, AFGU, AFGW, AFSU, AFSW, AFUW, AGSU, AGSW, AGUW, ASUW, FGSU, FGSW, FGUW, FSUW, GSUW)
X046-Y041-E13	4	30	(A, F, S, U, W) (AF, AS, AU, AW, FS, FU, FW, SU, SW, UW) (AFS, AFU, AFW, ASU, ASW, AUW, FSU, FSW, FUW, SUW) (AFSU, AFSW, AFUW, ASUW, FSUW)
X046-Y041-E15	4	30	(A, F, S, U, W) (AF, AS, AU, AW, FS, FU, FW, SU, SW, UW) (AFS, AFU, AFW, ASU, ASW, AUW, FSU, FSW, FUW, SUW) (AFSU, AFSW, AFUW, ASUW, FSUW)
X046-Y042-E05	3	7	(A, F, U) (AF, AU, FU) (AFU)
X046-Y042-E06	3	7	(A, F, U) (AF, AU, FU) (AFU)
X046-Y042-E15	4	15	(A, F, G, U) (AF, AG, AU, FG, FU, GU) (AFG, AFU, AGU, FGU) (AFGU)
X046-Y043-E02	3	7	(A, F, U) (AF, AU, FU) (AFU)
X046-Y043-E04	3	7	(A, F, U) (AF, AU, FU) (AFU)
X046-Y043-E05	4	15	(A, F, G, U) (AF, AG, AU, FG, FU, GU) (AFG, AFU, AGU, FGU) (AFGU)
X046-Y043-E06	3	7	(A, F, U) (AF, AU, FU) (AFU)
X046-Y043-E15	3	7	(A, F, U) (AF, AU, FU) (AFU)
X046-Y044-E02	3	7	(A, F, U) (AF, AU, FU) (AFU)
X046-Y044-E04	4	15	(A, F, U, W) (AF, AU, AW, FU, FW, UW) (AFU, AFW, AUW, FUW) (AFUW)
X046-Y044-E05	4	15	(A, F, U, W) (AF, AU, AW, FU, FW, UW) (AFU, AFW, AUW, FUW) (AFUW)
X046-Y045-E02	3	7	(A, F, U) (AF, AU, FU) (AFU)
X046-Y045-E04	3	7	(A, F, W) (AF, AW, FW) (AFW)
X046-Y046-E02	4	15	(F, G, S, W) (FG, FS, FW, GS, GW, SW) (FGS, FGW, FSW, GSW) (FGSW)
X046-Y047-E02	3	7	(F, S, W) (FS, FW, SW) (FSW)
X046-Y048-E07	3	7	(F, S, W) (FS, FW, SW) (FSW)
X047-Y041-E15	3	7	(A, F, W) (AF, AW, FW) (AFW)
X047-Y042-E15	4	15	(A, F, U, W) (AF, AU, AW, FU, FW, UW) (AFU, AFW, AUW, FUW) (AFUW)
X047-Y043-E02	3	7	(A, F, U) (AF, AU, FU) (AFU)

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**Table S1**, continued

Block	LCR <sub>max</sub>	n <sub>LCC</sub>	LCC
X047-Y043-E04	3	7	(A, F, U) (AF, AU, FU) (AFU)
X047-Y043-E05	3	7	(A, F, U) (AF, AU, FU) (AFU)
X047-Y043-E15	3	7	(A, F, U) (AF, AU, FU) (AFU)
X047-Y044-E02	4	15	(A, F, S, W) (AF, AS, AW, FS, FW, SW) (AFS, AFW, ASW, FSW) (AFSW)
X047-Y044-E04	4	15	(A, F, U, W) (AF, AU, AW, FU, FW, UW) (AFU, AFW, AUW, FUW) (AFUW)
X047-Y044-E05	3	7	(A, F, W) (AF, AW, FW) (AFW)
X047-Y045-E02	3	7	(A, F, U) (AF, AU, FU) (AFU)
X047-Y046-E02	2	6	(F, S, W) (FS, FW, SW)
X047-Y047-E02	3	7	(F, G, S) (FG, FS, GS) (FGS)
X047-Y047-E07	3	7	(F, G, S) (FG, FS, GS) (FGS)
X047-Y048-E07	3	7	(F, G, S) (FG, FS, GS) (FGS)
X048-Y046-E02	3	7	(A, F, U) (AF, AU, FU) (AFU)
X048-Y046-E07	3	7	(F, G, S) (FG, FS, GS) (FGS)
X048-Y047-E07	3	7	(F, G, S) (FG, FS, GS) (FGS)
X048-Y048-E07	2	3	(F, S) (FS)
X048-Y049-E07	2	3	(F, S) (FS)
X049-Y048-E07	2	3	(F, S) (FS)

**Supplementary Table 2. Landscape diversity effects on landscape functioning based on GlobeLand30 land-cover map.** For three productivity metrics ( $EVI'_{gs}$ : growing-season-integrated EVI;  $\overline{EVI}'$ : average growing-season EVI;  $EVI'_{max}$ : peak EVI), the table shows the dependency on land-cover type richness (LCR), whether mixtures are more productive than single-LC landscapes ( $NE > 0$ ), whether the net diversity effect NE depends on LCR, and whether the temporal stability of productivity ( $CV^{-1}$ ) depends on LCR.

Metric	Effect of LCR		NE>0		Effect of LCR on NE		Effect of LCR on $CV^{-1}$	
	F-value	P-value	t-value	P-value	F-value	P-value	F-value	P-value
$EVI'_{gs}$	$F_{1,39}=2.4$	0.129	$t_{35}=3.9$	<0.001	$F_{1,35}=1.2$	0.289	$F_{1,40}=1.3$	0.260
$\overline{EVI}'$	$F_{1,39}=2.6$	0.118	$t_{35}=4.0$	<0.001	$F_{1,35} = 1.1$	0.294	$F_{1,40}=1.3$	0.260
$EVI'_{max}$	$F_{1,39}=1.2$	0.273	$t_{35}=2.2$	0.018	$F_{1,35}=0.6$	0.443	$F_{1,40}=0.2$	0.659