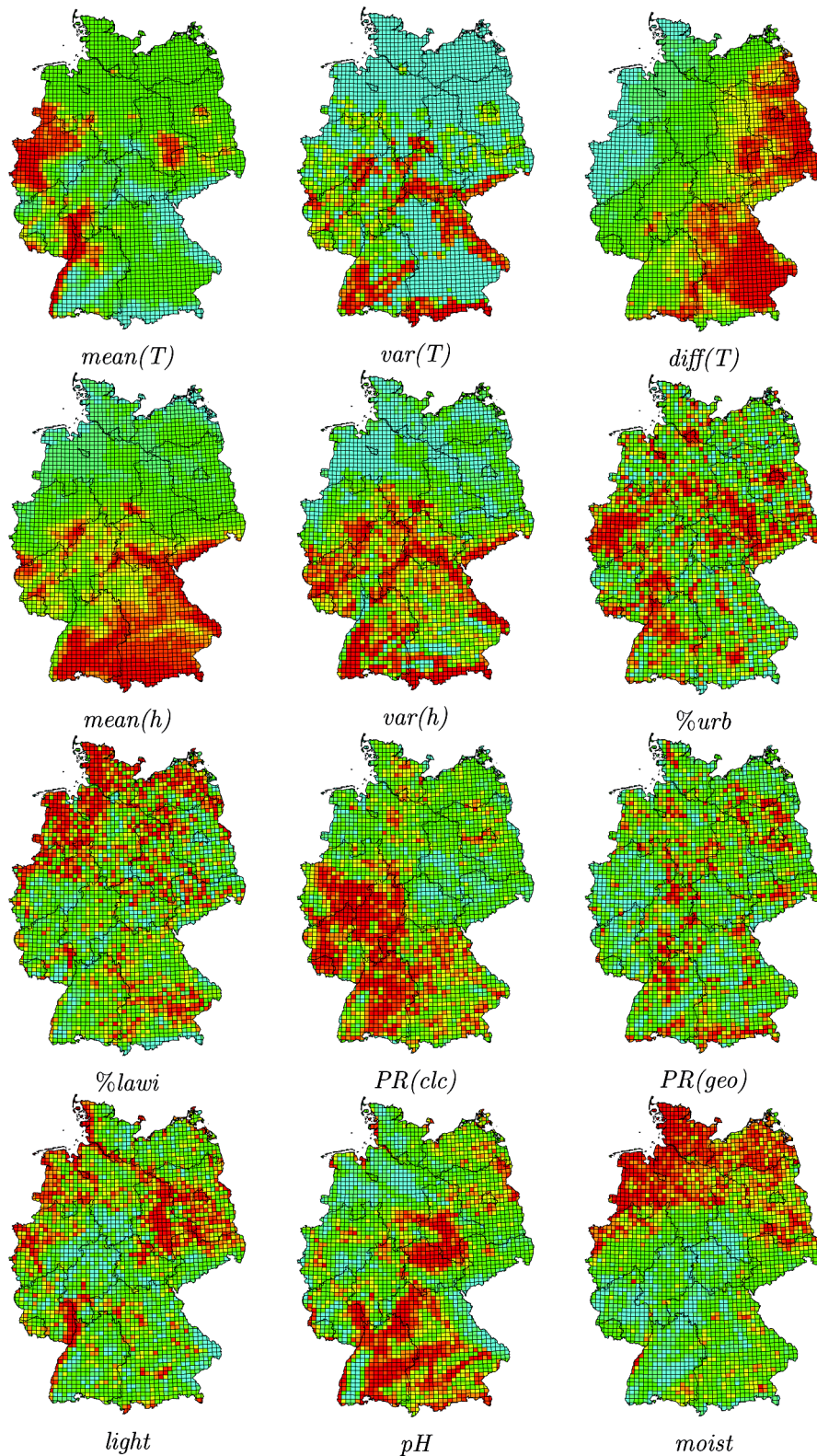


## Supplementary material

Appendix S1. Predictor-space: 0, 25, 50, 75 and 100%-quartiles for the twelve environmental correlates of German grid cells with all 50 control species and an area >117 km<sup>2</sup>. mean(T): average annual temperature, var(T): variance of annual temperature, diff(T): difference of mean January and mean July temperature, mean(h): average altitude, var(h): variance of altitude, %urb: percentage of urban area, %agri: percentage of agricultural area, PR(land): patch richness of land use, PR(geo): patch richness of geology, light: Ellenberg indicator value for light, pH: Ellenberg indicator value for soil reaction, moist: Ellenberg indicator value for moisture.

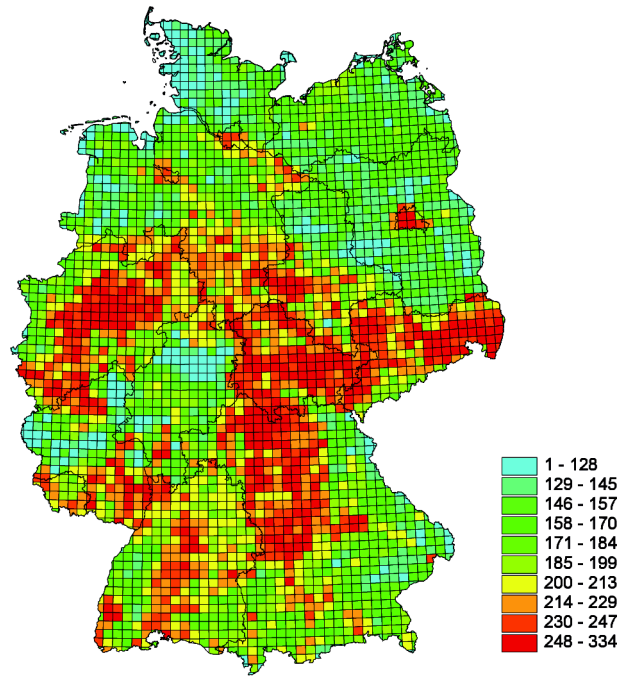
	0%	25%	Quartiles 50%	75%	100%
mean(T) [°C]	4.73	8.50	8.50	8.68	10.50
var(T) [°C]	0.00	0.00	4.00e-76	1.87e-01	2.43
diff(T) [°C]	13.00	15.39	16.39	17.10	19.11
mean(h) [m]	20.88	40.73	135.24	333.97	1076.52
var(h) [m]	0.00	30.89	1399.83	5409.39	64658.92
%urb	0.00	0.03	0.05	0.12	0.93
%agri	0.01	0.42	0.60	0.75	0.99
PR(land)	15	49	66	93	191
PR(geo)	1	11	15	19	51
light	5.91	6.37	6.51	6.66	7.23
pH	4.51	5.71	6.03	6.34	7.22
moist	4.80	6.24	6.79	7.32	8.68



Appendix S2. Distribution maps of the environmental correlates. Classes were built with decantiles, values increase from blue to red,  $mean(T)$ : average annual temperature,  $var(T)$ : variance of annual temperature,  $diff(T)$ : difference of mean January and mean July temperature,  $mean(h)$ : average altitude,  $var(h)$ : variance of altitude,  $\%urb$ : percentage of urban area,  $\%agri$ : percentage of agricultural area,  $PR(clc)$ : patch richness of land use,  $PR(geo)$ : patch richness of geology,  $light$ : Ellenberg indicator value for light,  $pH$ : Ellenberg indicator value for soil reaction,  $moist$ : Ellenberg indicator value for moisture.

Appendix S3. Model parameter  $\beta$  and corresponding error probabilities  $p$  of the reduced model fits for all species and the subsets for the growth forms to the ordinary linear model and the spatial error model; n.s.: not significant, mean(T): average annual temperature, var(T): variance of annual temperature, diff(T): difference of mean January and mean July temperature, mean(h): average altitude, var(h): variance of altitude, %urb: percentage of urban area, %agri: percentage of agricultural area, PR(clc): patch richness of land use, PR(geo): patch richness of geology, light: Ellenberg indicator value for light, pH: Ellenberg indicator value for soil reaction, moist: Ellenberg indicator value for moisture.

	linear model			spatial error model		
	$\beta$	$p$		$\beta$	$p$	
*) all species						
Intercept	-0.107	<2e-16	***	-0.107	<0.001	***
diff(T)	0.003	2.95e-07	***	0.004	<0.001	***
mean(h)	0.005	3.44e-08	***	0.003	0.004583	**
var(h)	-0.002	0.00709	**	n.s.	n.s.	
%urban	0.002	0.00103	**	0.002	0.002207	**
%agri	0.004	7.23e-09	***	0.003	<0.001	***
light	-0.007	<2e-16	***	-0.006	<0.001	***
pH	0.024	<2e-16	***	0.023	<0.001	***
moist	-0.014	<2e-16	***	-0.013	<0.001	***
a) annual herbs						
Intercept	-0.2404	<0.001	***	-0.2402	<0.001	***
diff(T)	-0.0054	<0.001	***	-0.0053	<0.01	**
mean(h)	0.0149	<0.001	***	0.0118	<0.001	***
var(h)	-0.0049	<0.01	**	n.s.	n.s.	
%urban	0.0111	<0.001	***	0.0088	<0.001	***
%agri	0.0088	<0.001	***	0.0064	<0.001	***
PR(clc)	0.0029	<0.05	*	n.s.	n.s.	
pH	0.0128	<0.001	***	0.0143	<0.001	***
moist	-0.0125	<0.001	***	-0.0122	<0.001	***
b) perennial herbs						
Intercept	-0.1486	<0.001	***	-0.1488	<0.001	***
mean(T)	-0.0023	<0.01	**	n.s.	n.s.	
diff(T)	0.0064	<0.001	***	0.0053	<0.001	***
mean(h)	-0.0019	<0.05	*	n.s.	n.s.	
%urban	-0.0023	<0.01	**	-0.0026	<0.001	***
%agri	0.0020	<0.01	**	0.0015	<0.05	*
light	-0.0068	<0.001	***	-0.0065	<0.001	***
pH	0.0279	<0.001	***	0.0269	<0.001	***
moist	-0.0084	<0.001	***	-0.0077	<0.001	***
c) shrubs						
Intercept	1.2173	<0.001	***	1.2169	<0.001	***
var(T)	0.0153	<0.001	***	0.0149	<0.001	***
diff(T)	0.0053	<0.05	*	n.s.	n.s.	
var(H)	-0.0191	<0.001	***	-0.0186	<0.001	***
%agri	0.0148	<0.001	***	0.0118	<0.001	***
PR(clc)	0.0172	<0.001	***	0.0169	<0.001	***
light	-0.0106	<0.001	***	-0.0125	<0.001	***
pH	0.0241	<0.001	***	0.0293	<0.001	***
moist	-0.0094	<0.001	***	n.s.	n.s.	
d) trees						
Intercept	1.5462	<0.001	***	1.5467	<0.001	***
mean(T)	0.0161	<0.001	***	<0.1		
mean(h)	0.0148	<0.1	**	n.s.	n.s.	
var(h)	-0.0133	<0.01	**	n.s.	n.s.	
light	-0.0112	<0.01	**	-0.0110	<0.01	**
pH	-0.0139	<0.001	***	n.s.	n.s.	



Appendix S4. Distribution map of the number of competitors per grid cell.