

Combining citizen science and Earth observation data to produce global maps of 31 plant traits

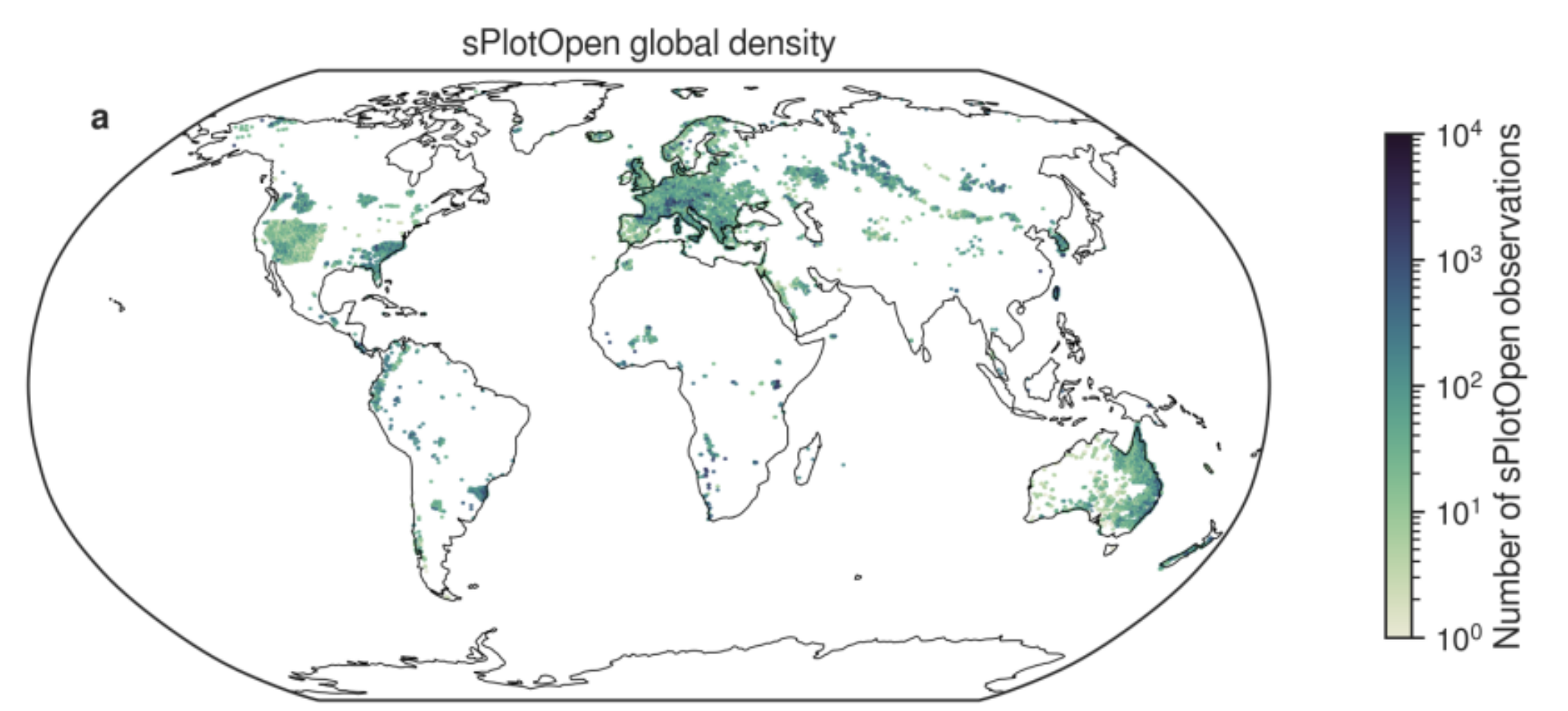
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background

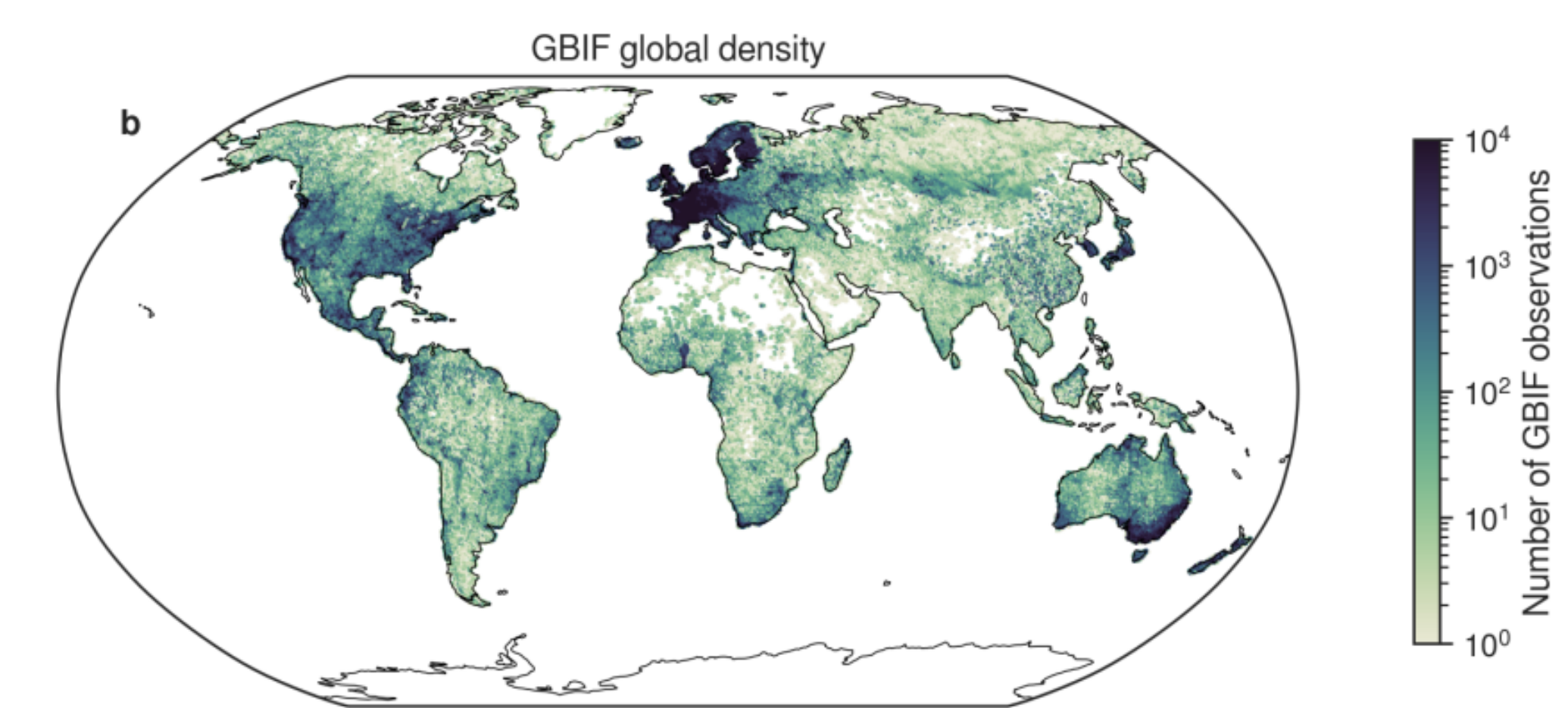
Trait mapping has extrapolation issues...

- Model training data is **sparse** (e.g. research plots),
- **clustered** (skewed toward “global north”),
- and sometimes **simplistic** (e.g. PFTs)



Citizen science species observations...

- are **~10x more abundant** than research plots
- have **greater geographic coverage**



research question

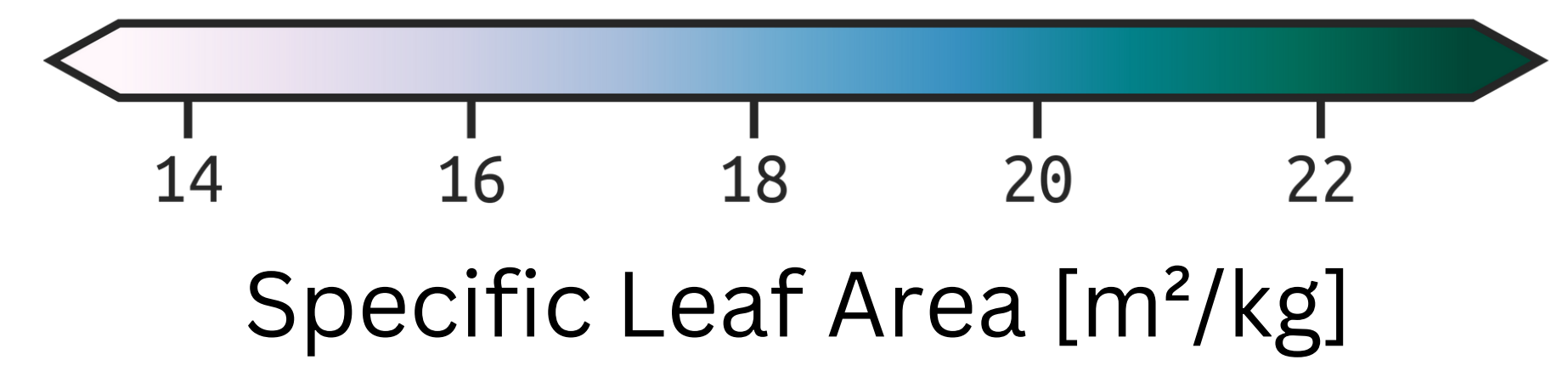
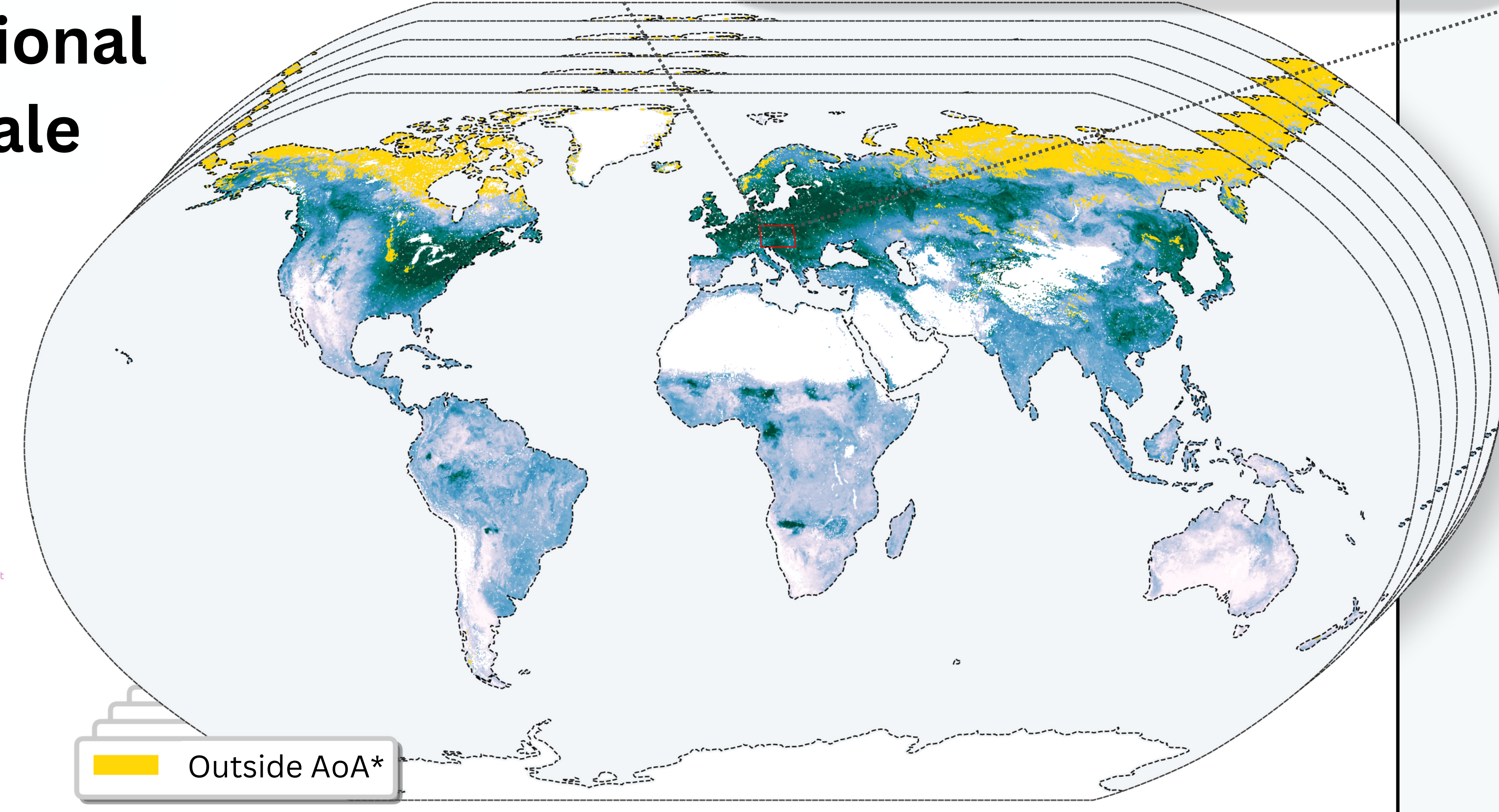
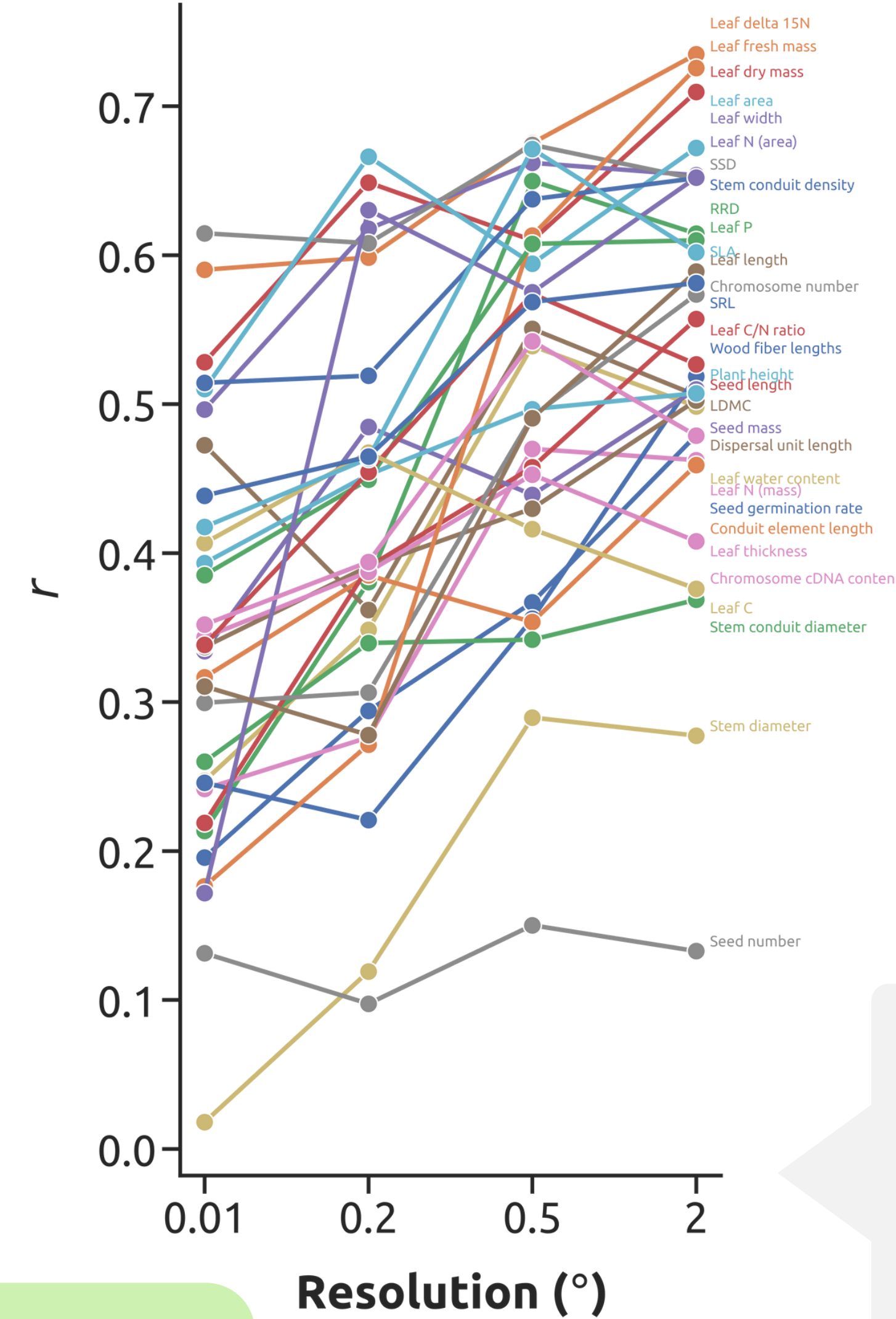
Can we use citizen science to address extrapolation issues in global trait mapping?

methods



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~1 km resolution maps for 31 plant functional traits at global scale



*Area of Applicability. See Meyer and Pebesma (2021)

results

Citizen science maps correlate well against benchmarks like sPlotOpen compared to previous studies.

	Leaf N (area)				SLA			
	2°	0.5°	0.2°	0.01°	2°	0.5°	0.2°	0.01°
Citizen science (this study)	0.65	0.66	0.62	0.5	0.6	0.67	0.46	0.42
Wolf et al., 2022	0.59	0.53	0.5	-	0.56	0.51	0.55	-
Schiller et al., 2021	0.69	0.59	-	-	0.61	0.6	-	-
Dong et al., 2023	0.49	0.56	-	-	0.32	0.34	-	-
Moreno et al., 2018	0.59	0.52	-	-	0.44	0.43	-	-
Boonman et al., 2020	0.54	0.48	-	-	0.46	0.5	-	-
Butler et al., 2017	0.47	0.47	-	-	0.23	0.27	-	-
Vallicrosa et al., 2022	-0.01	0.01	-	-	-	-	-	-
van Bodegom et al., 2014	-	-	-	-	0.44	0.45	-	-
Madani et al., 2018	-	-	-	-	0.16	0.01	-	-

perspectives

Citizen science maps have greater spatial transferability.

