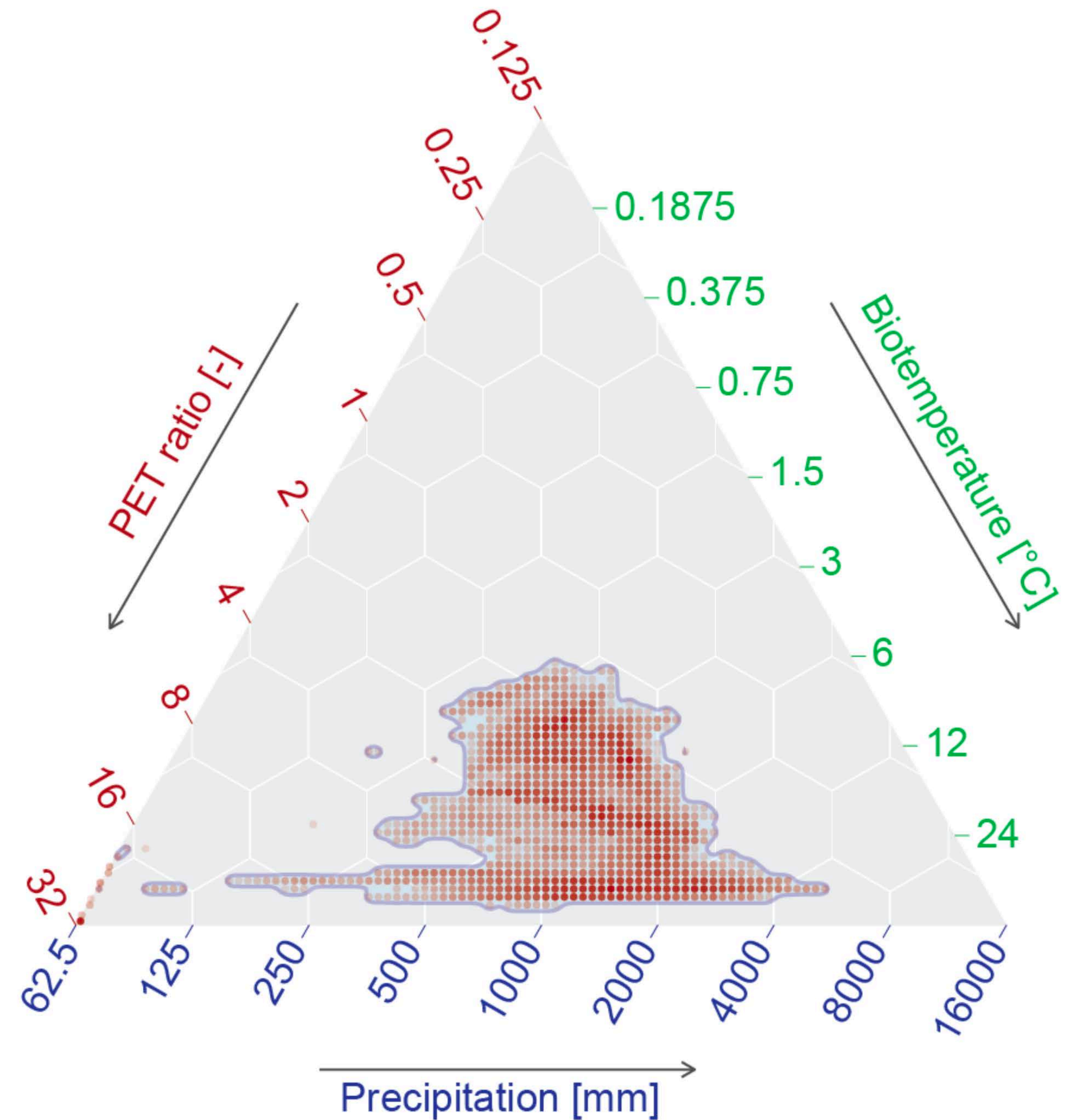


Food production
developed during
stable Holocene era



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Here, we aim to

- define Safe Climatic Space for food production
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Kummu, Heino, Taka, Varis & Viviroli

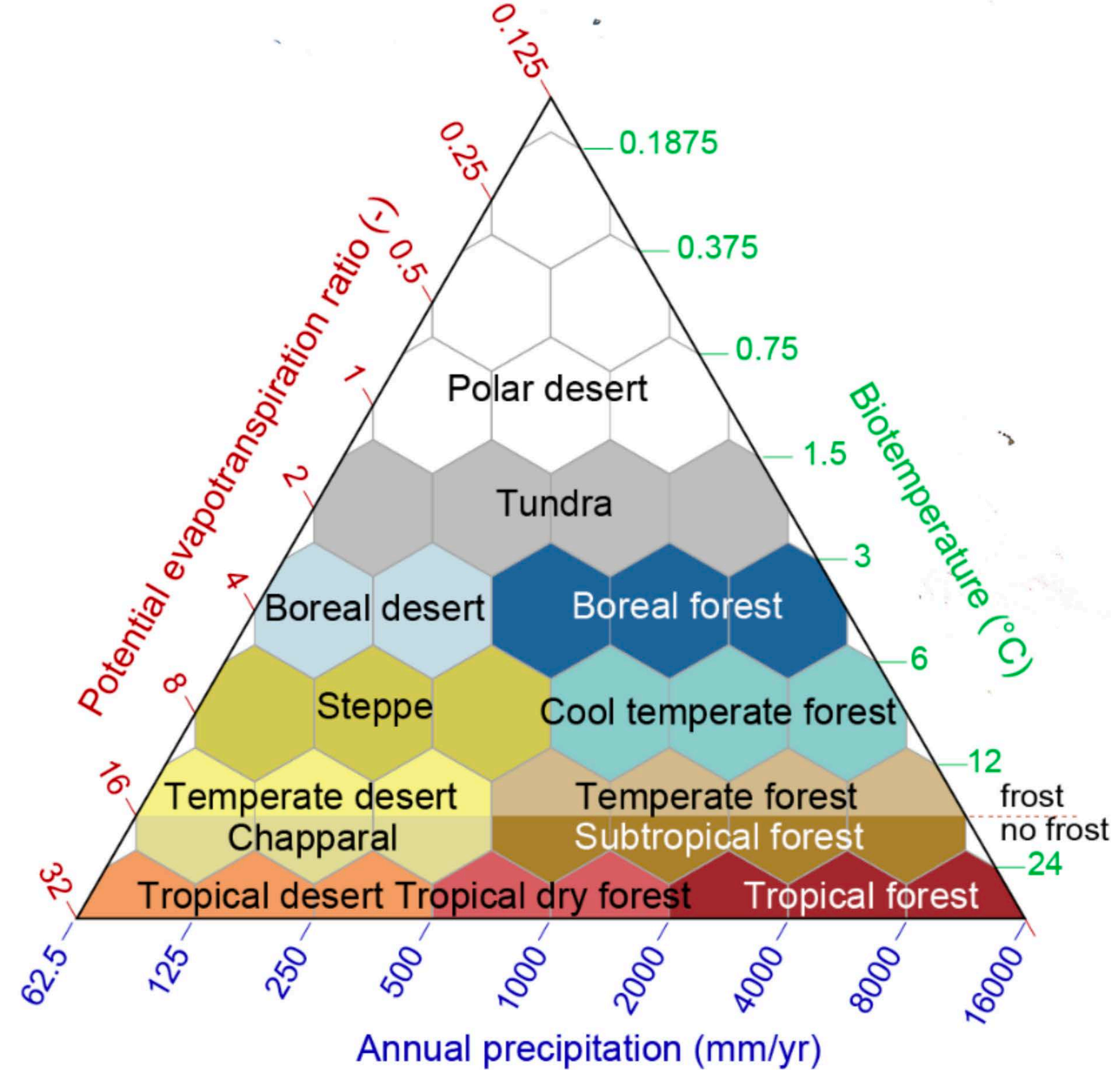
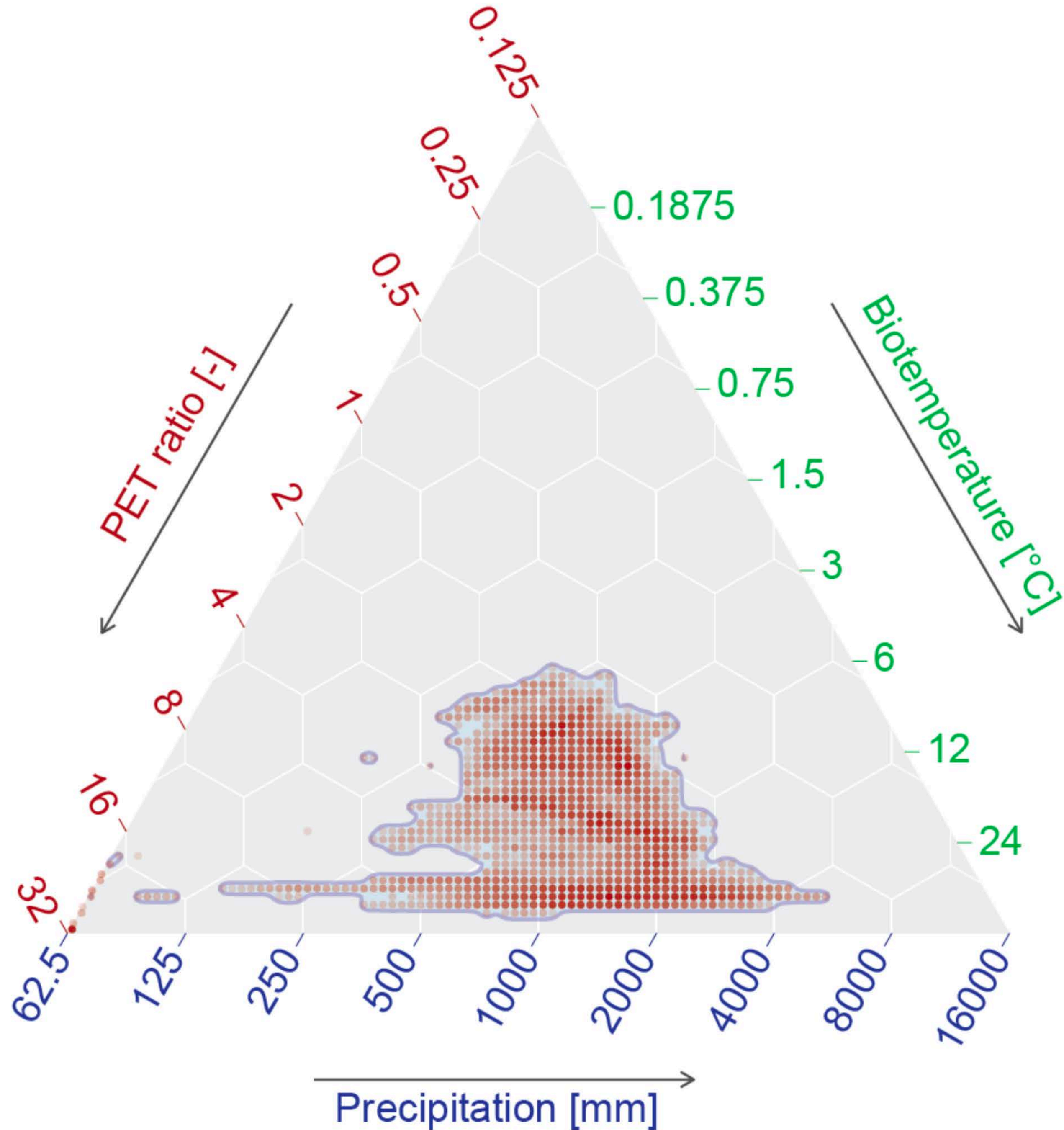
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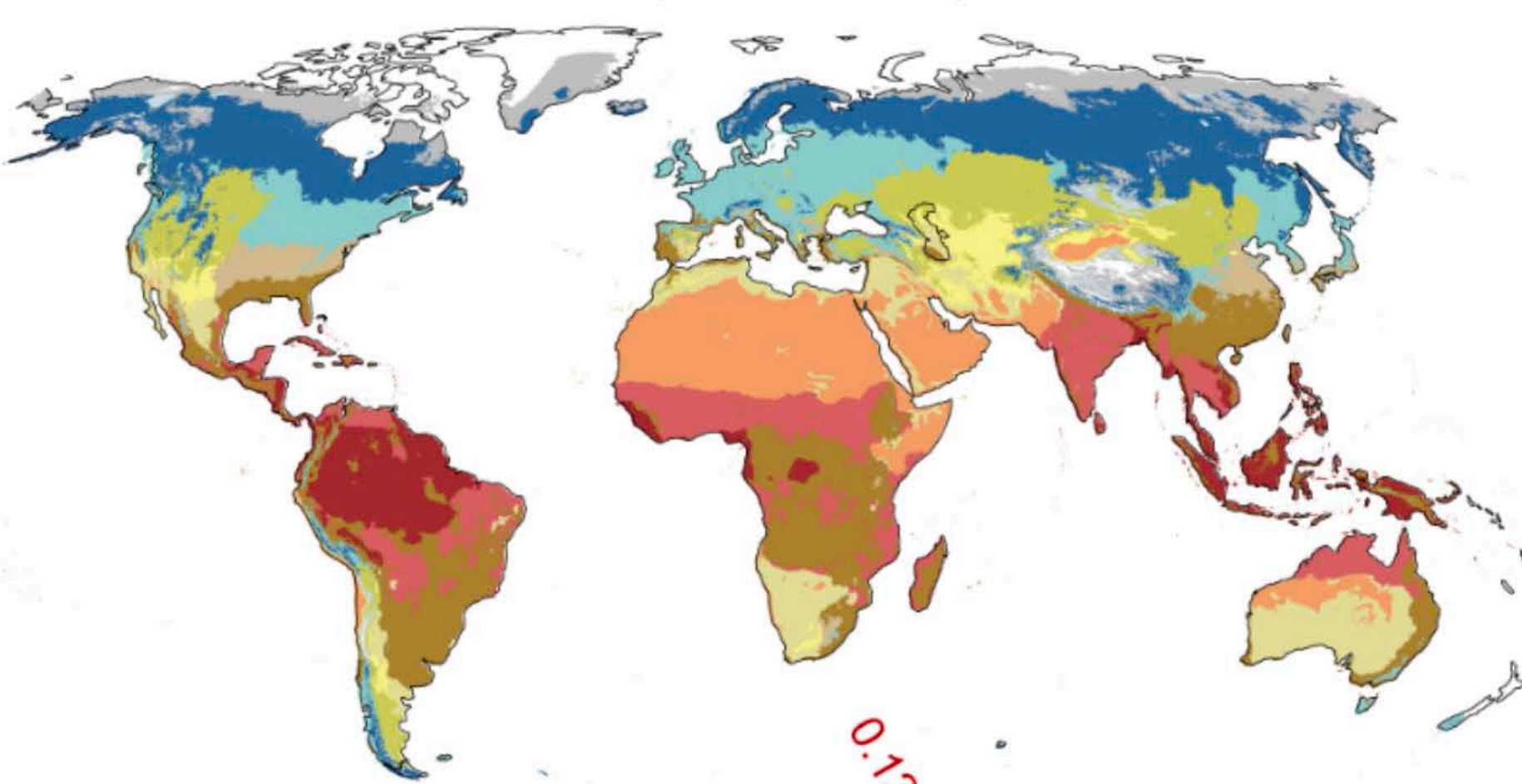
**Universität
Zürich^{UZH}**

Holdridge Life Zones

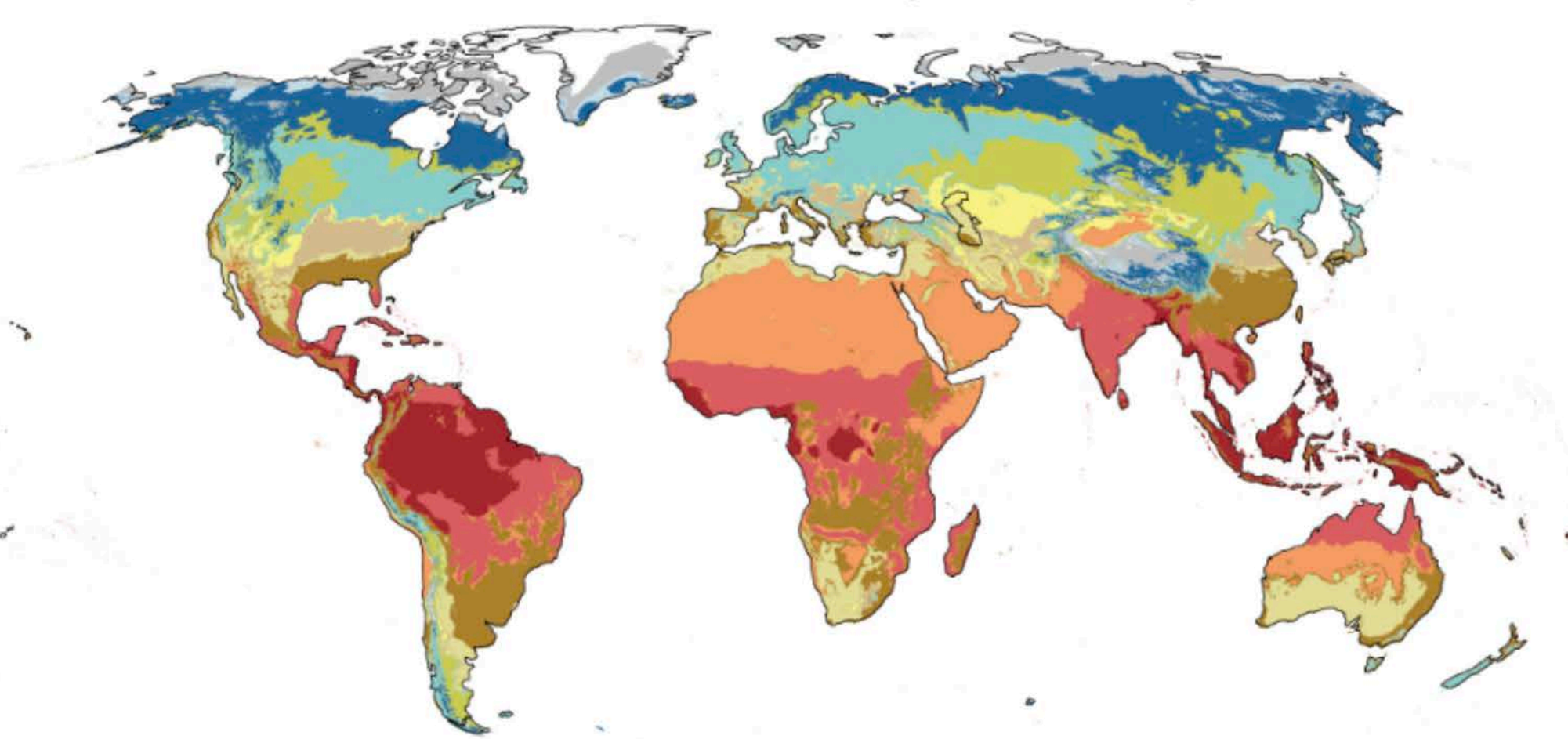


We used
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to first map
the change
in HLZs

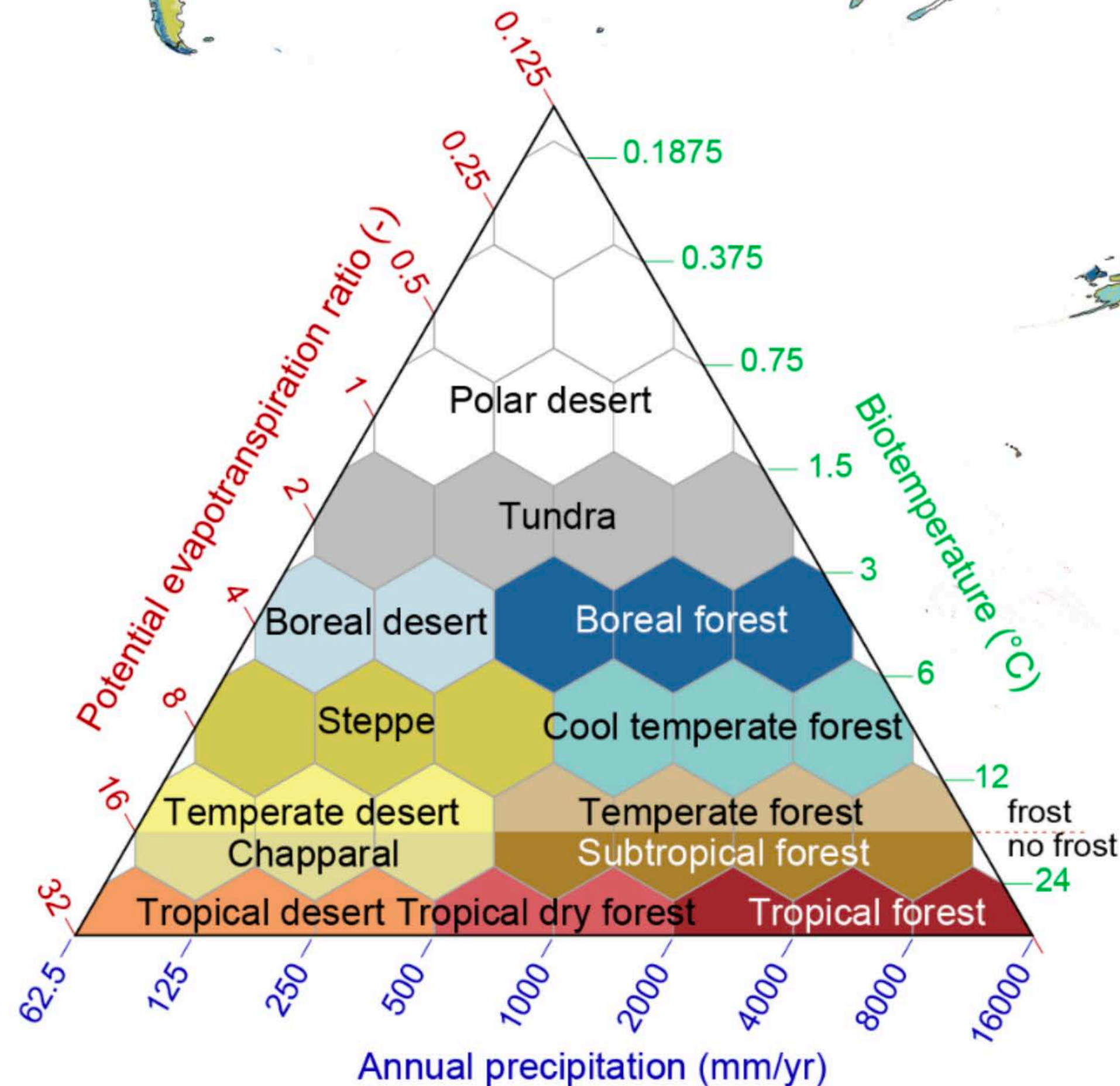
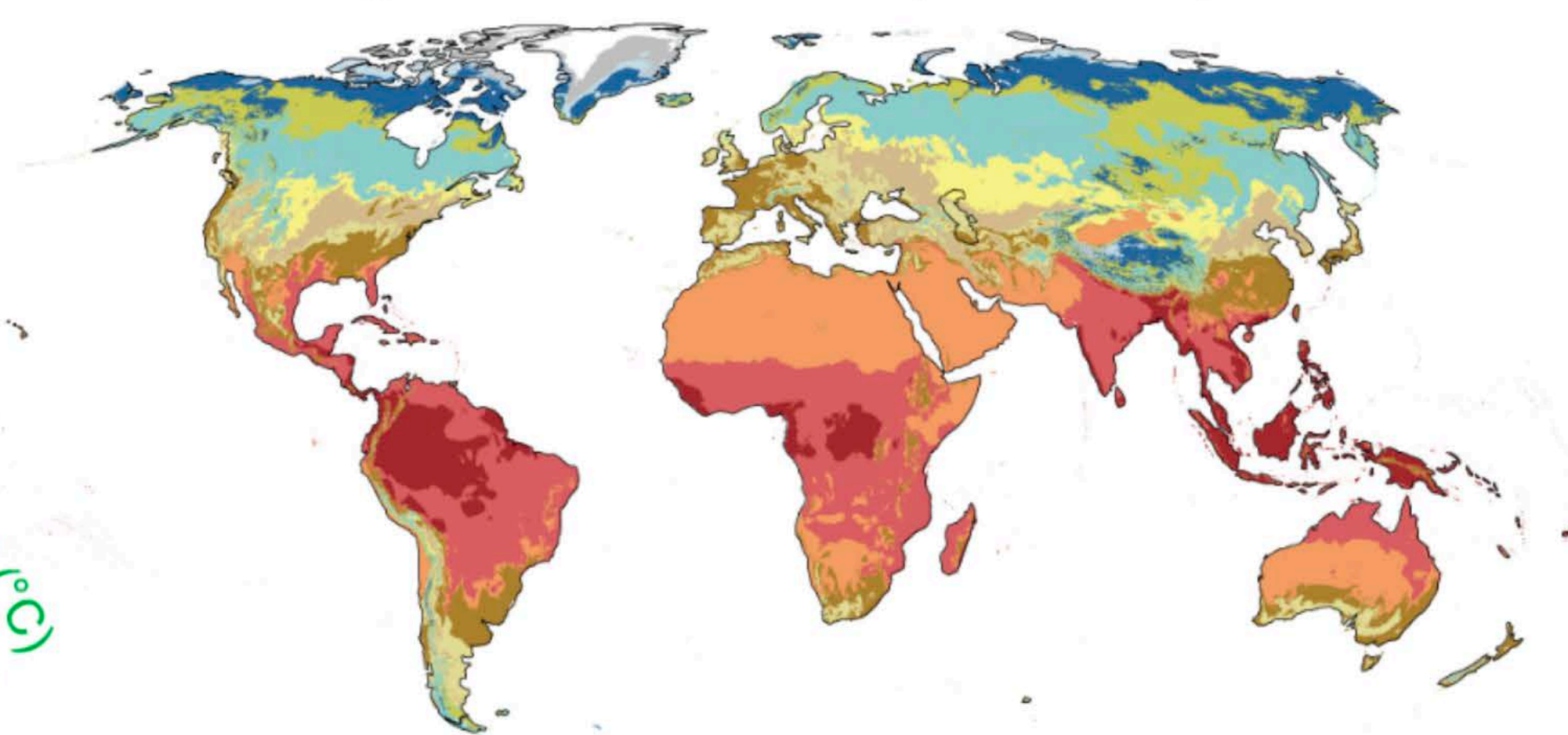
Baseline (1970-2000)



Low emission scenario (2081-2100)

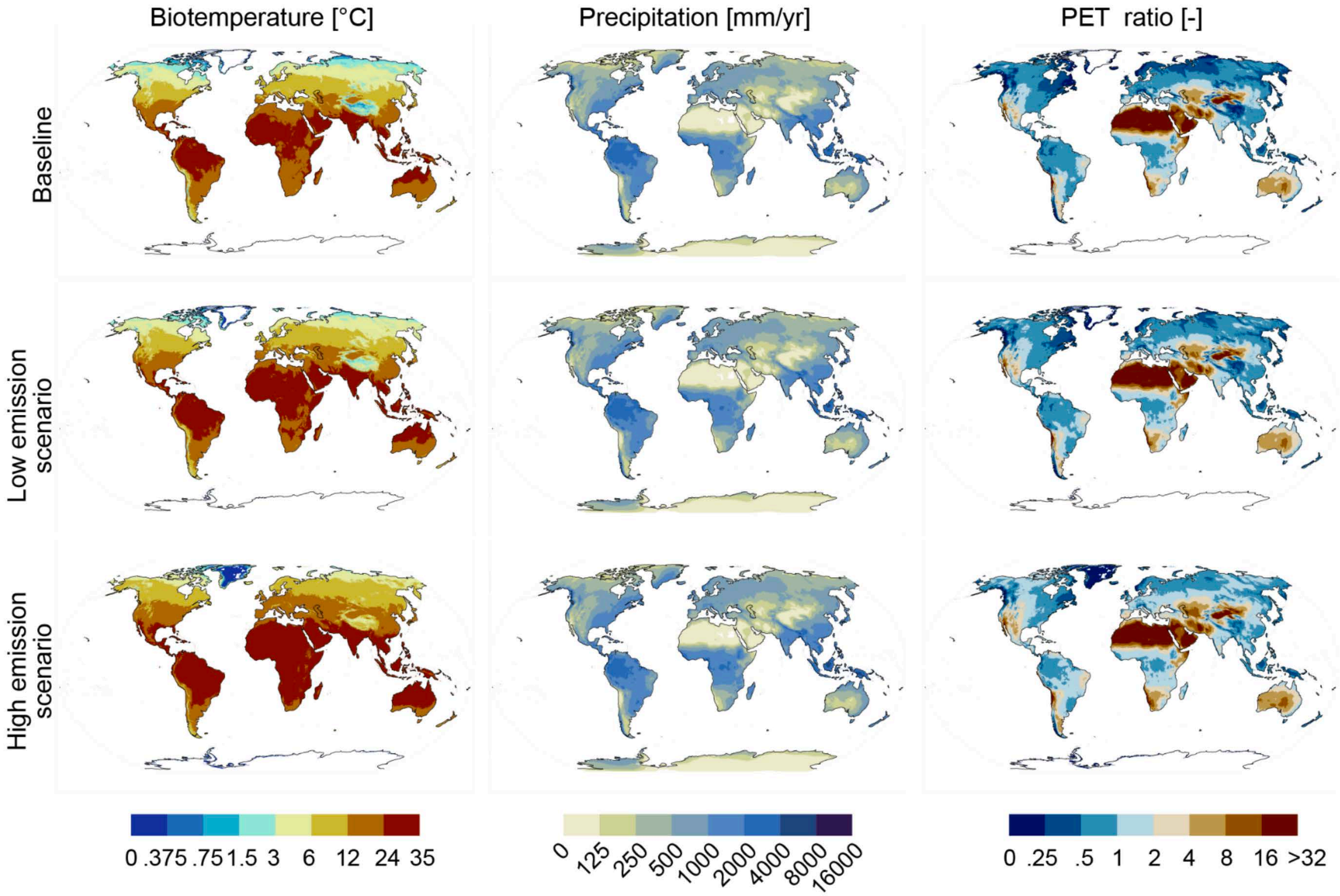


High emission scenario (2081-2100)



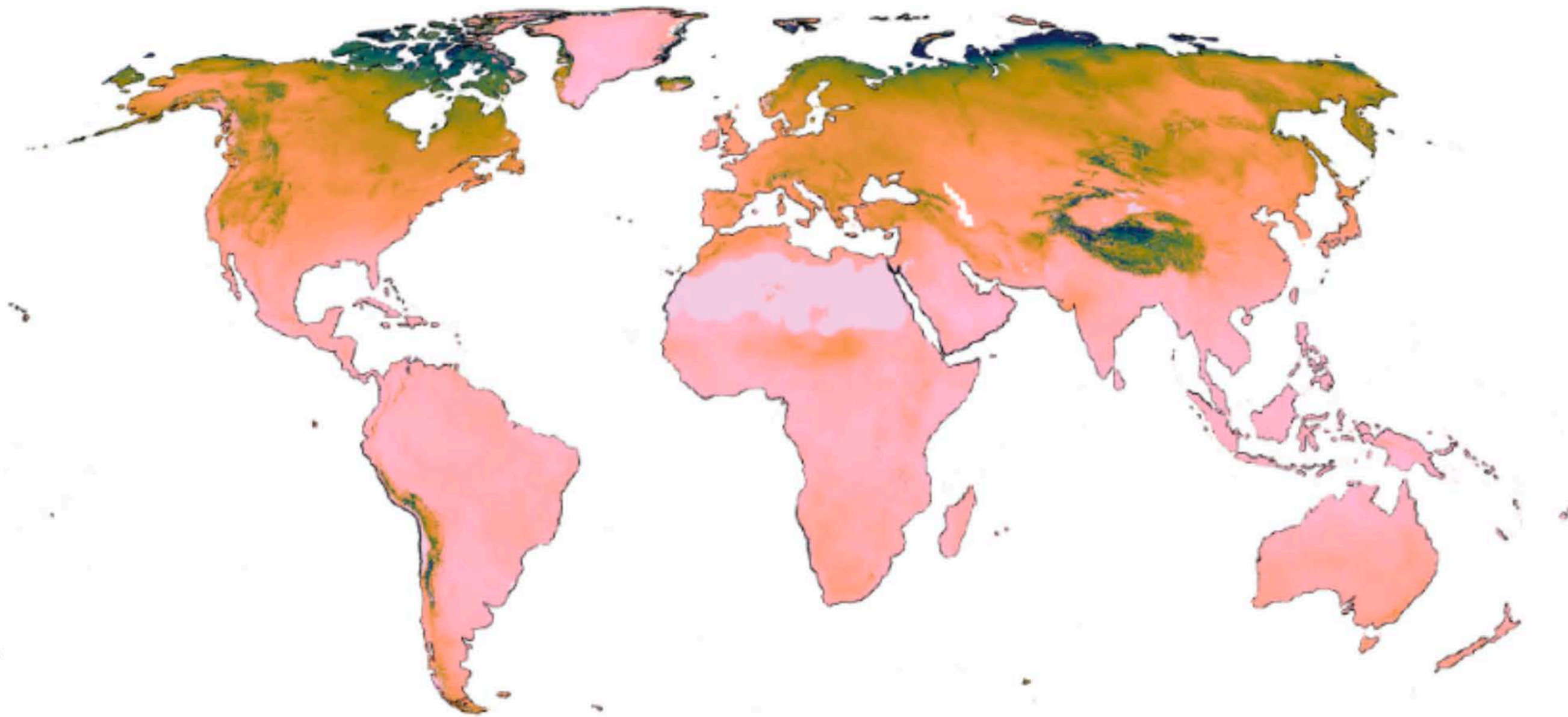
Data: Worldclim v2.1

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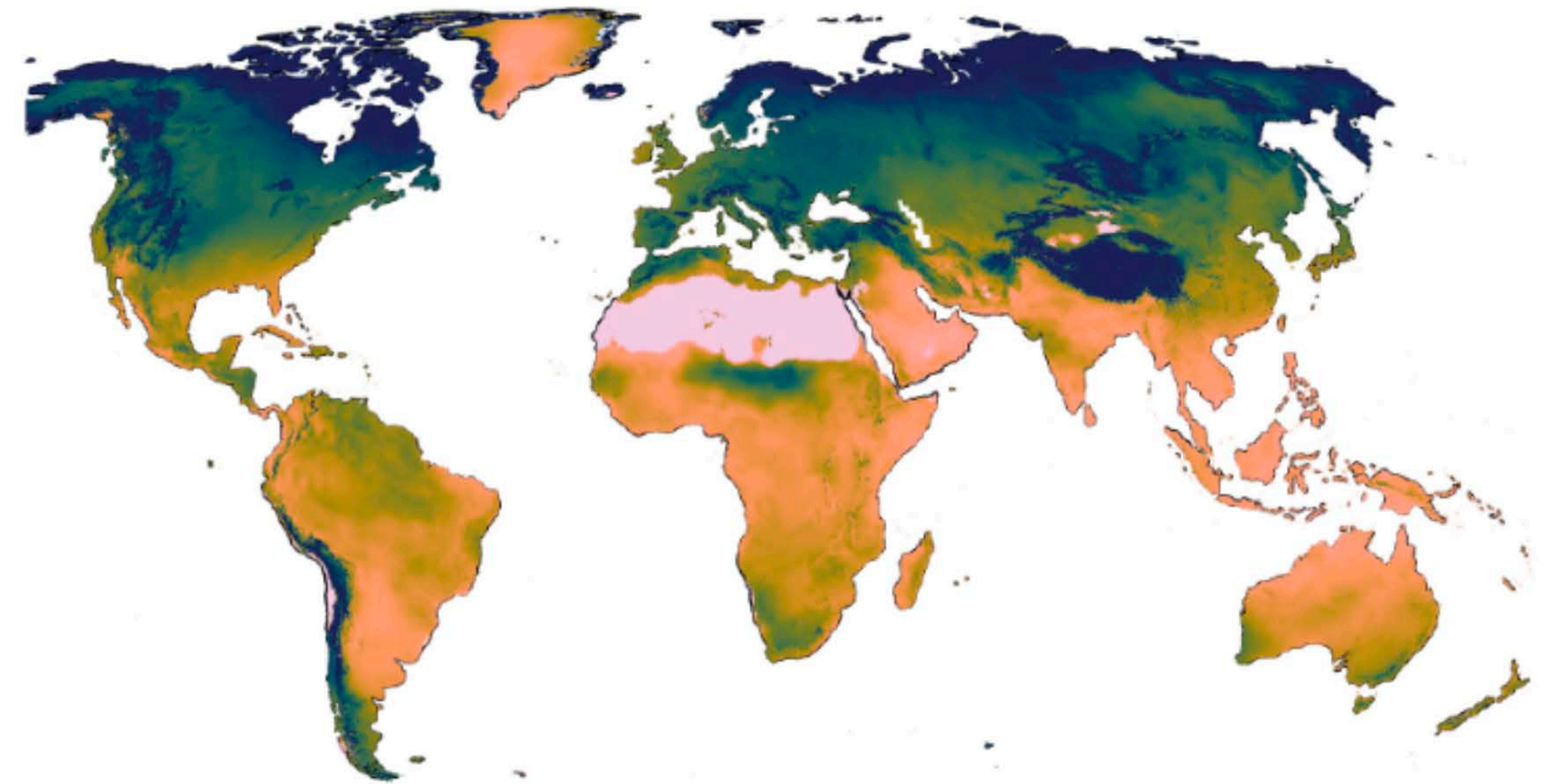


HLZ allows to go beyond change in categories

Low emission scenario



High emission scenario

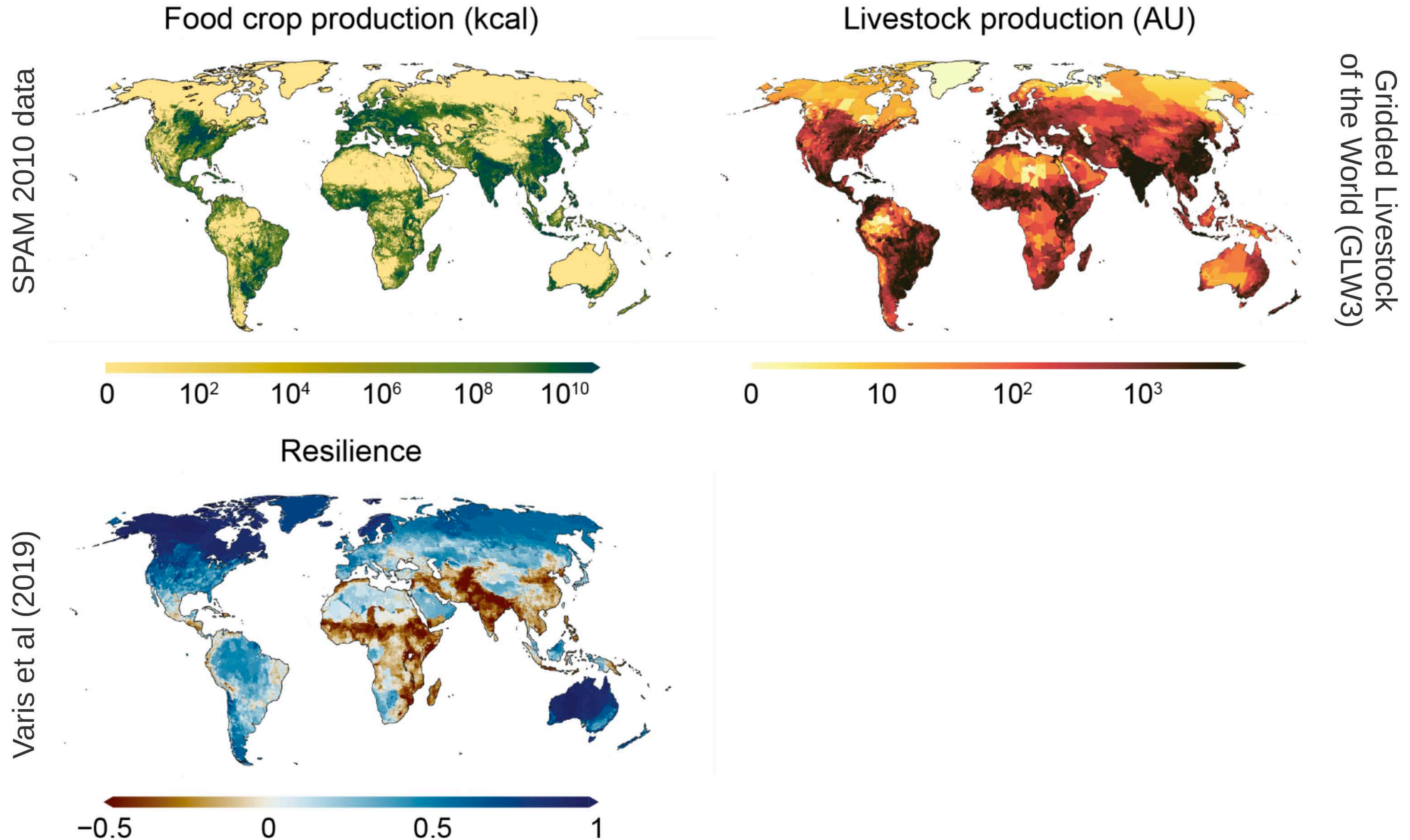


Change in HLZ triangle, from baseline to 2081-2100

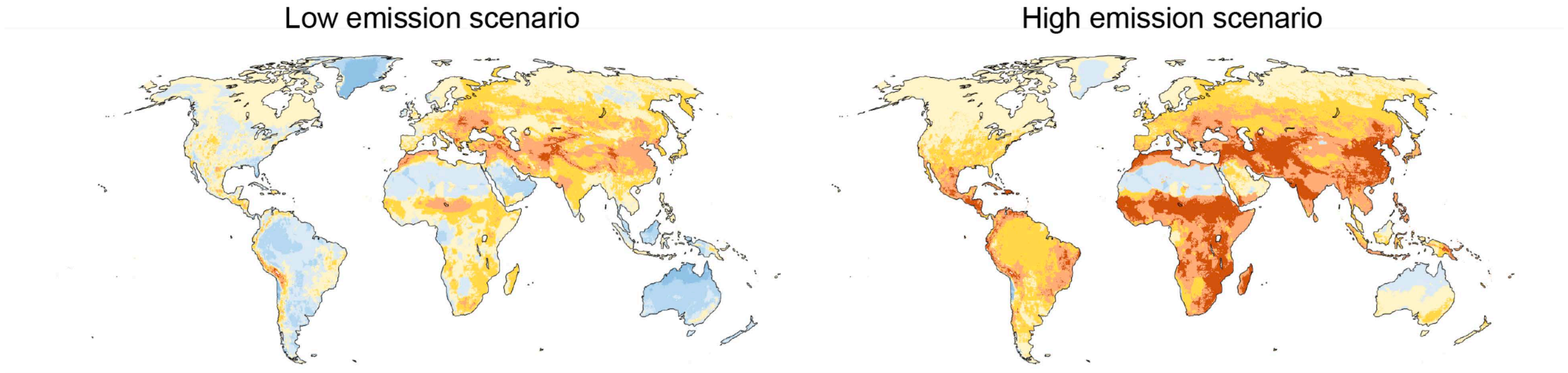


1 = *distance between
two holdridge classes*

We then linked the change with other input data



Over 2/3 of food crop production under high risk zone



		Food crop production (%)			
Resilience	very high	0	0.3	5.5	1.4
	high	1.2	1.6	13	2.1
	moderate	4.9	3.9	8.1	3.7
	low	17	17	19	0.6
		low	moderate	high	very high
Holdridge change					

0	0	0	7.3
0	0	1	17
0	0	4.4	16
0.5	0	21	32

High risk zone

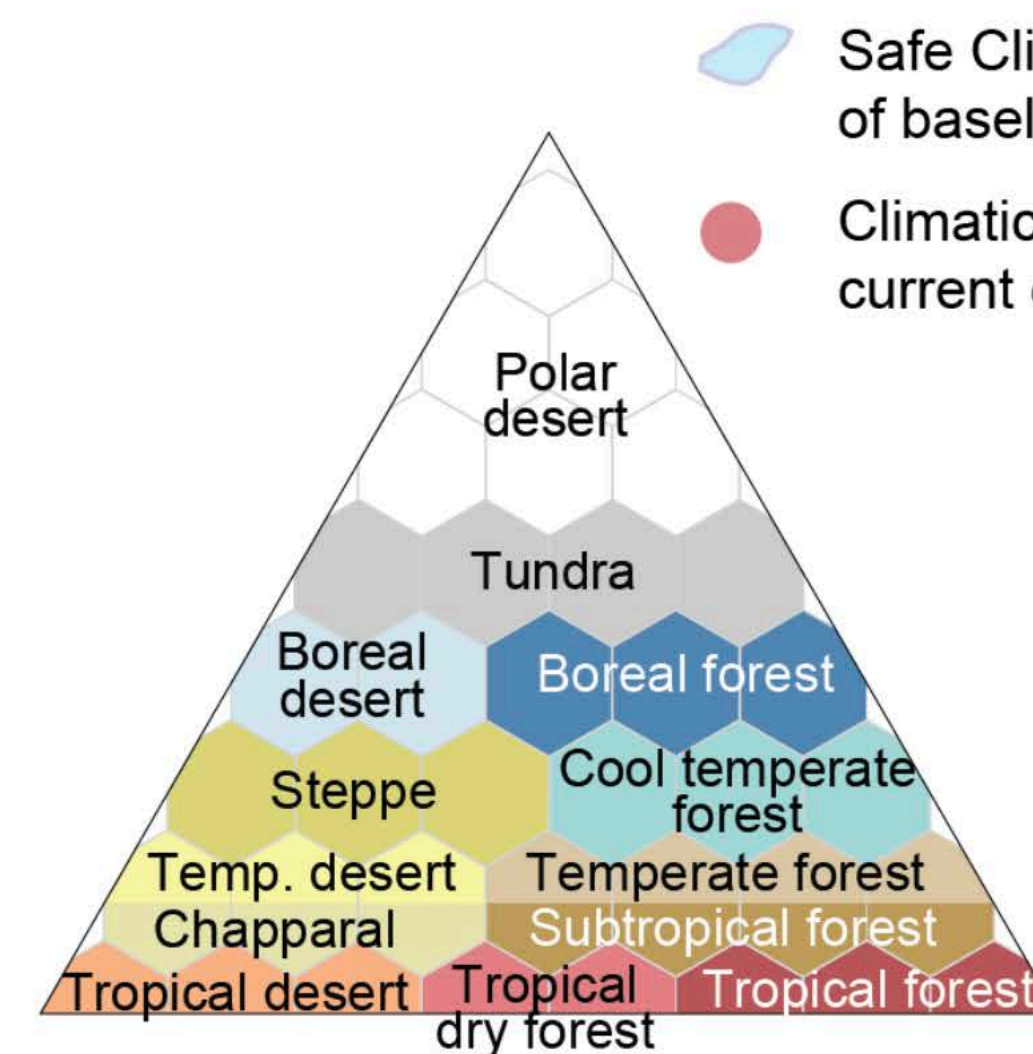
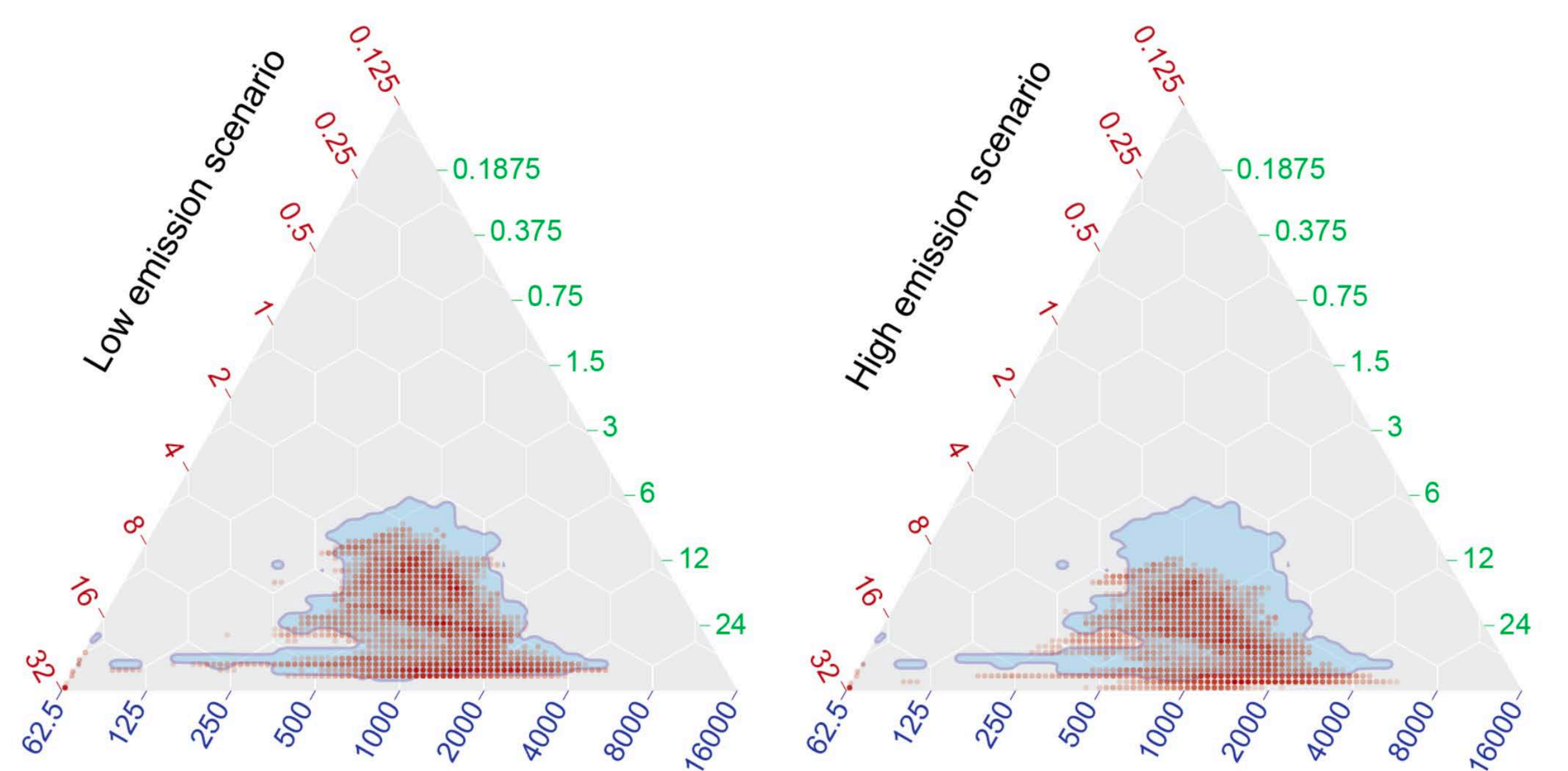
Critical risk zone

Risk falling outside Safe Climatic Space

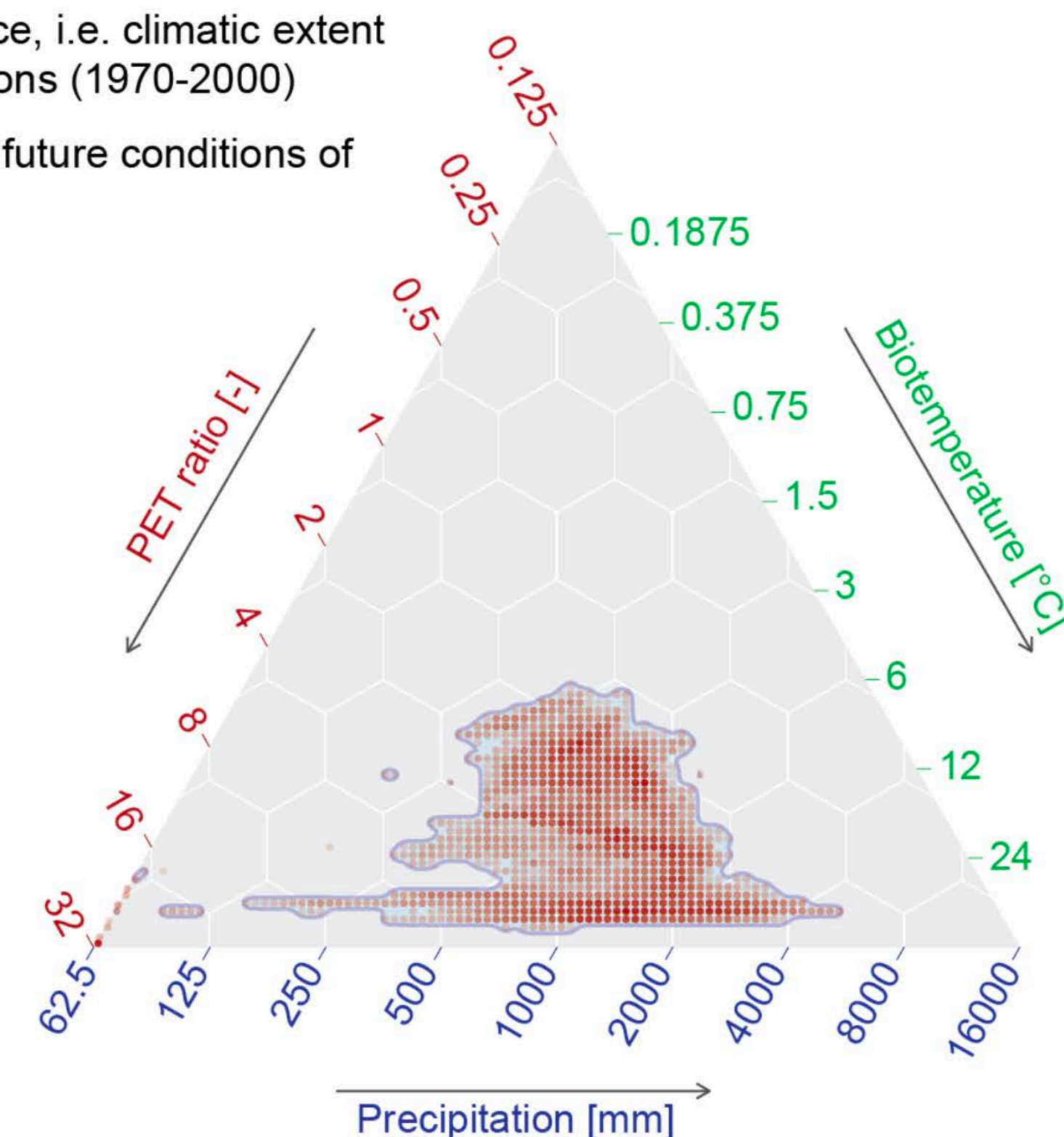
Low emission scenario
(SSP1-2.6): **4-10%**

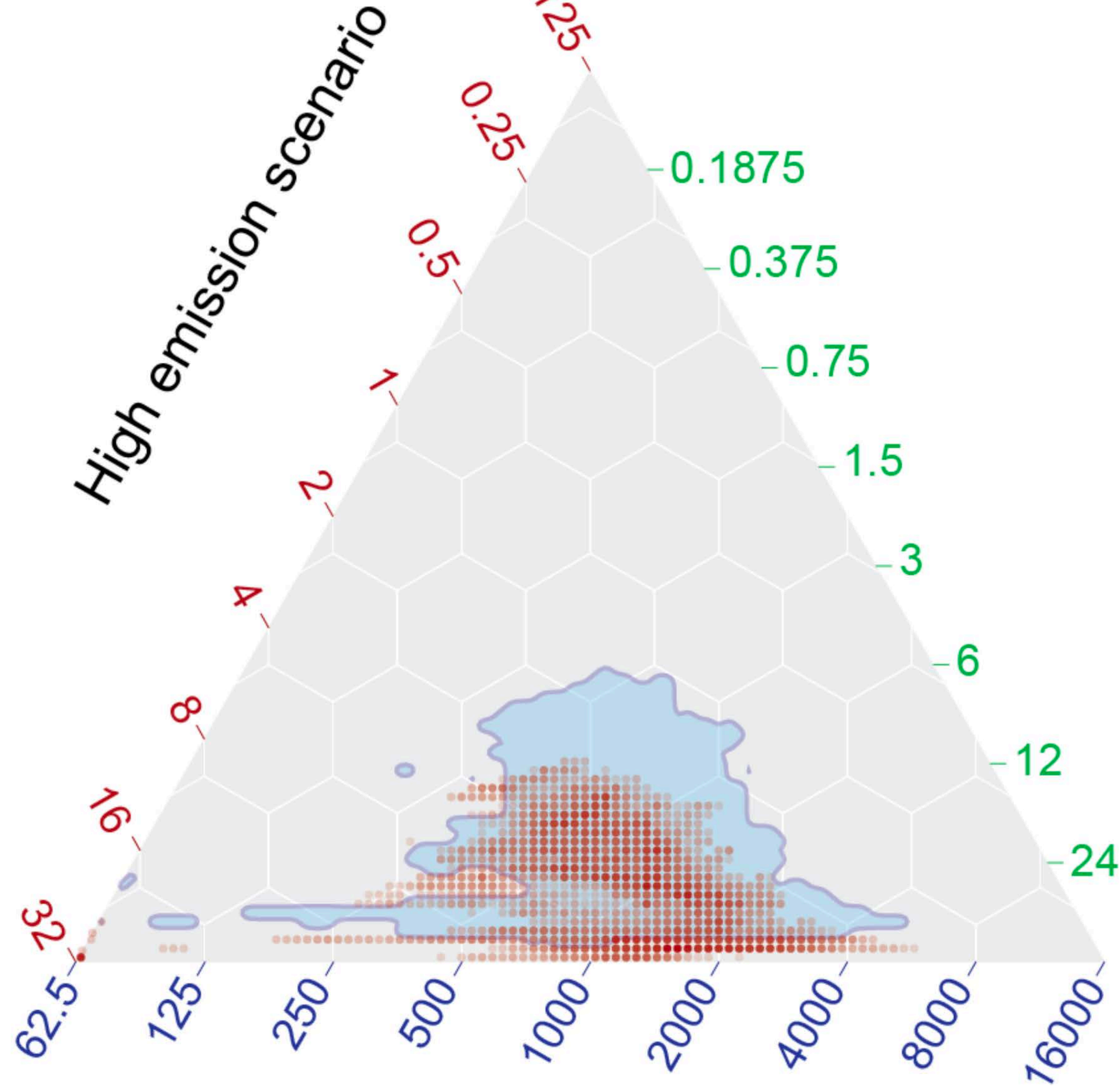
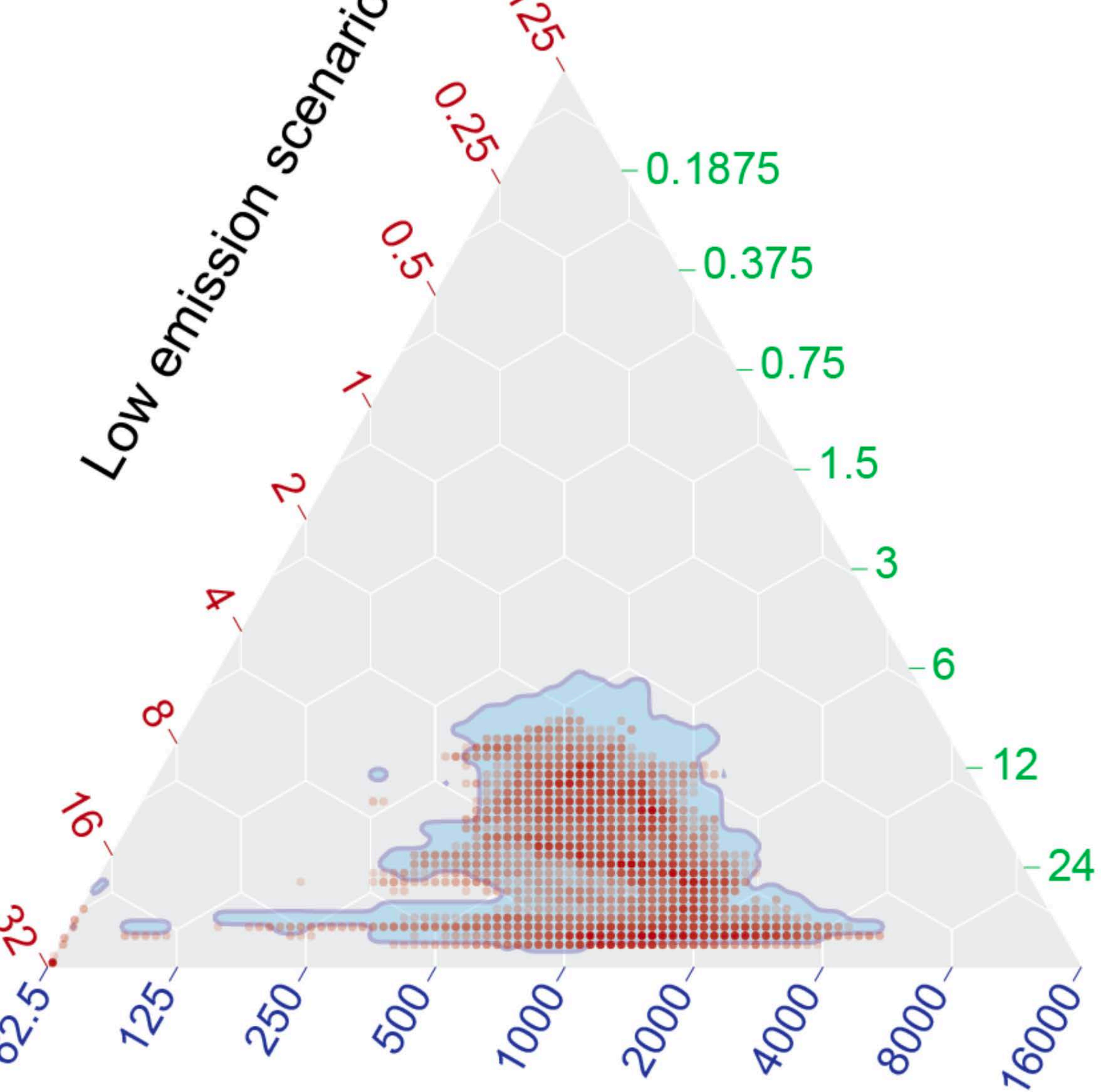
High emission scenario
(SSP5-8.5): **25-37%**

*of global food crop
production*

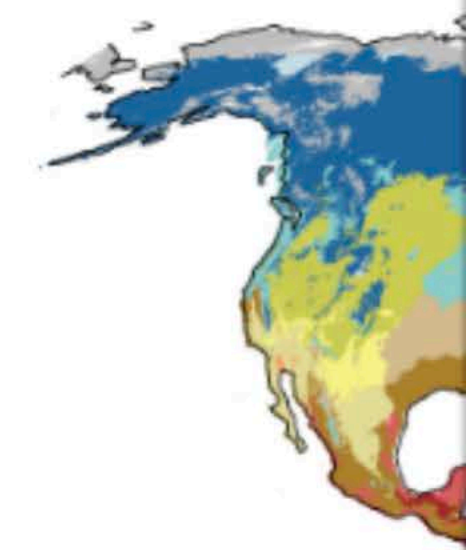


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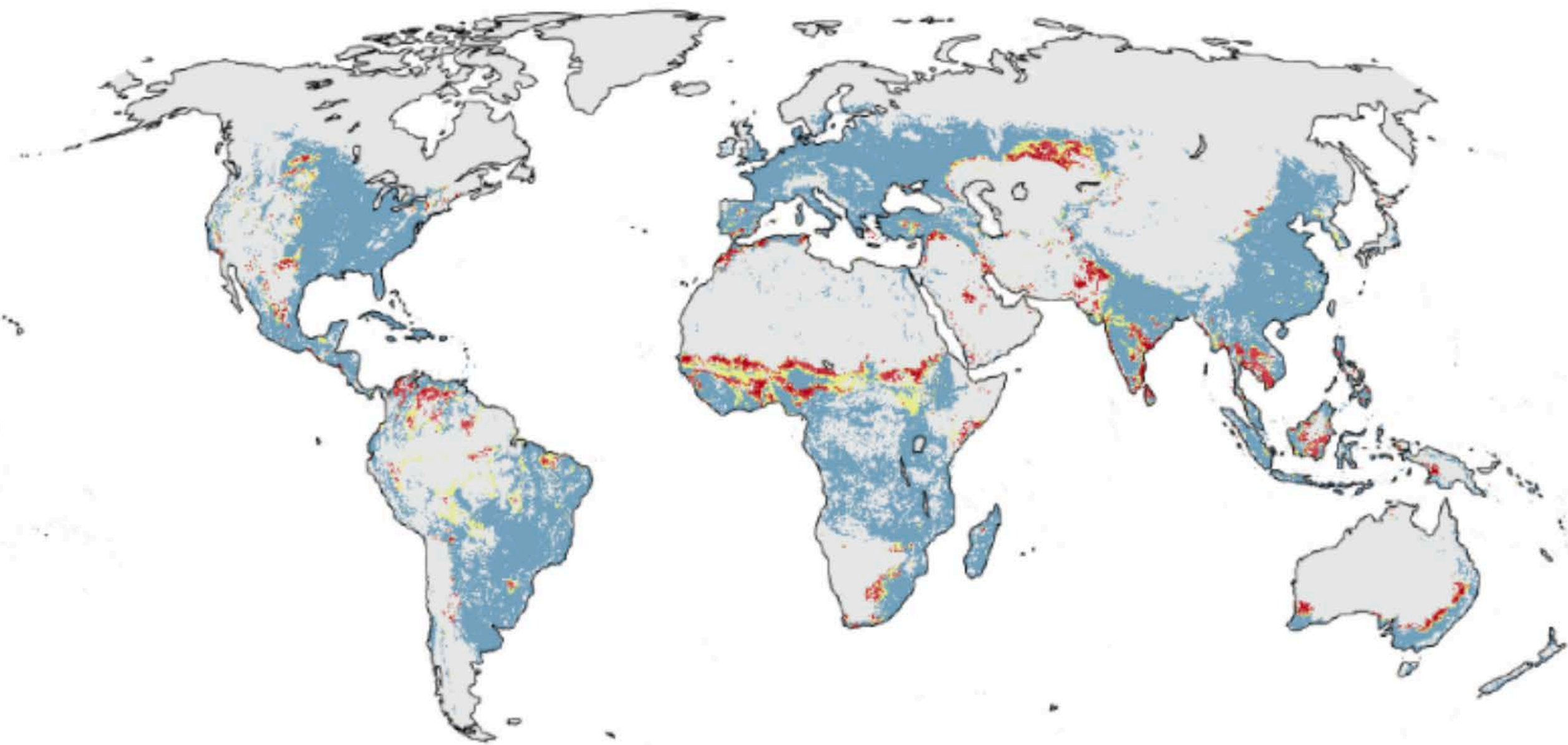


-  Safe Climatic Space, i.e. climatic extent of baseline conditions (1970-2000)
-  Climatic extent for future conditions of current cropland

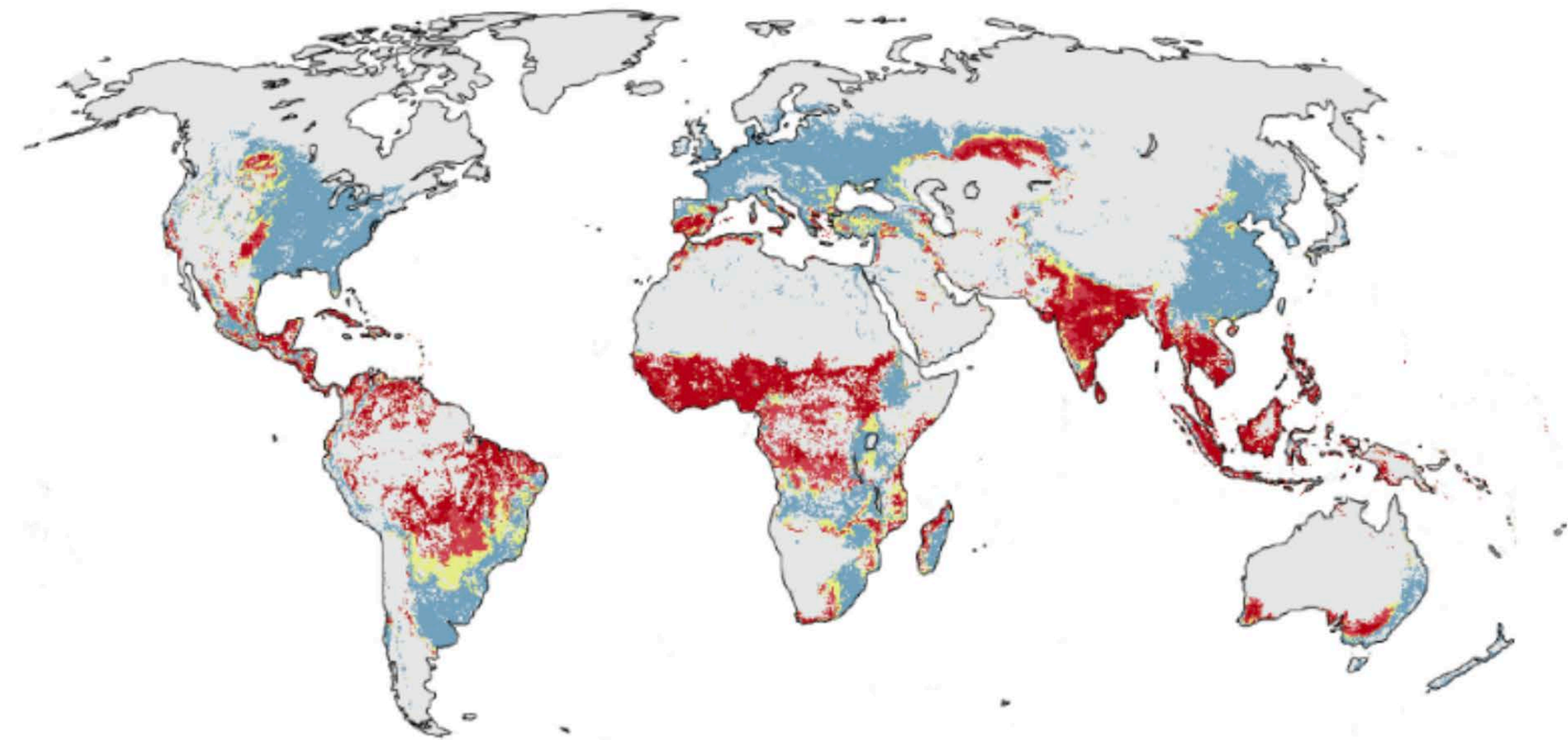


Vulnerability largest in South and Southeast Asia and Africa's Sudano-Sahelian Zone

Low emission scenario



High emission scenario



Areas within and outside Safe Climatic Space

Very likely
inside



Likely
inside



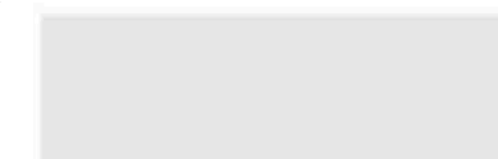
Potentially
outside



Likely
outside

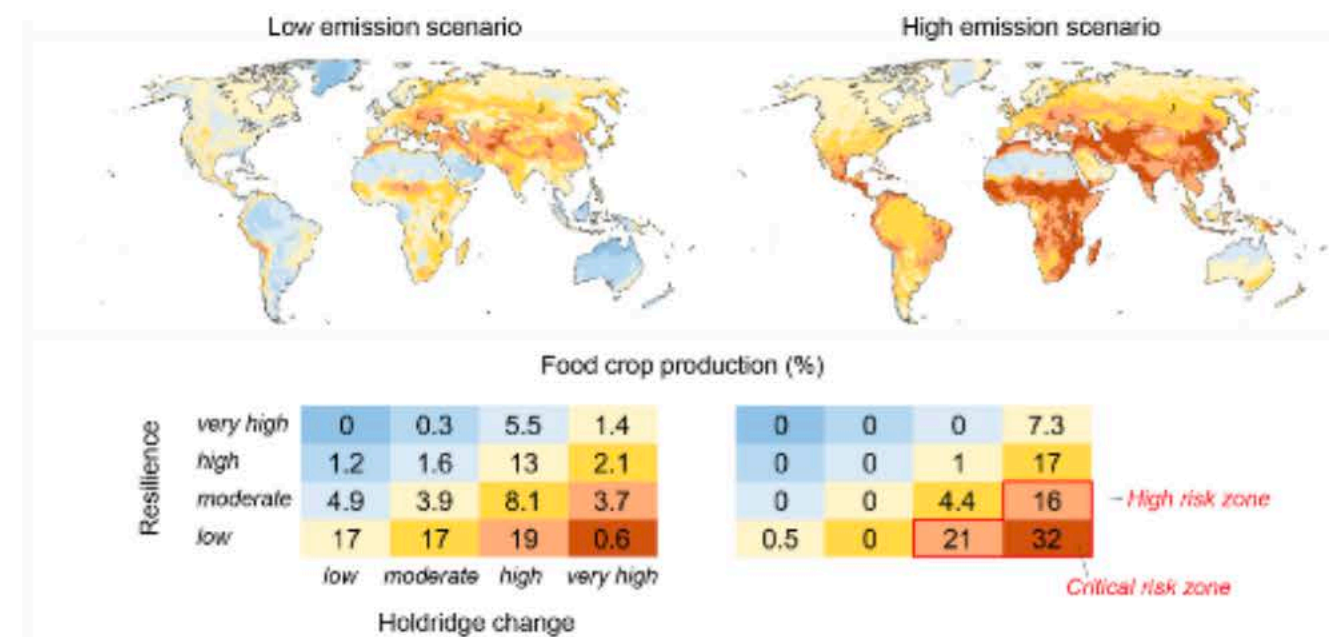


No or minor
production

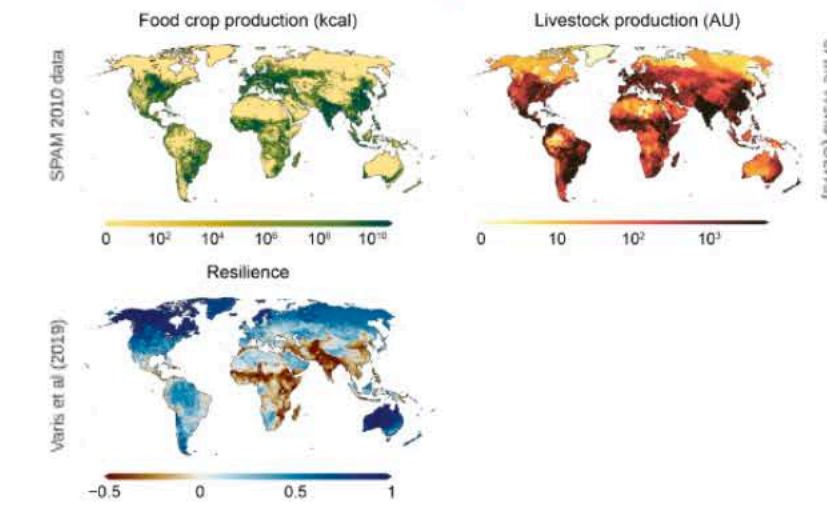


Our findings call for novel multi-sectoral approaches, that would both *increase adaptive capacity* and *mitigate climate change*

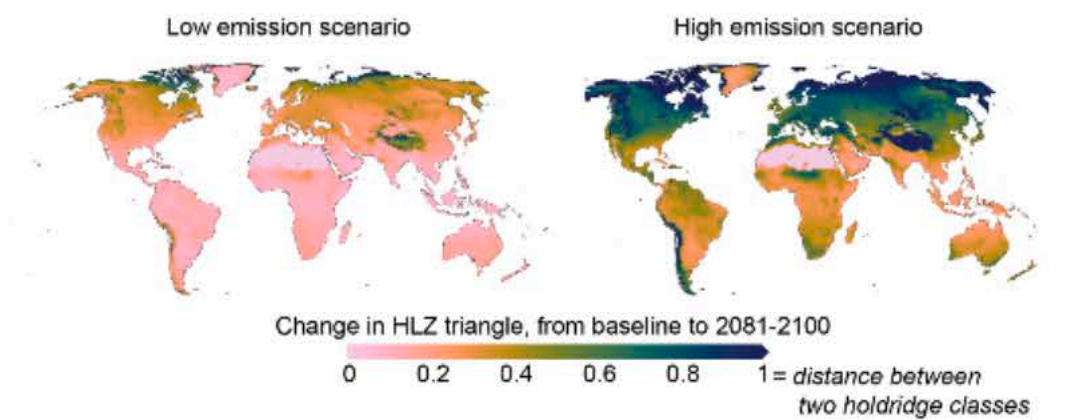
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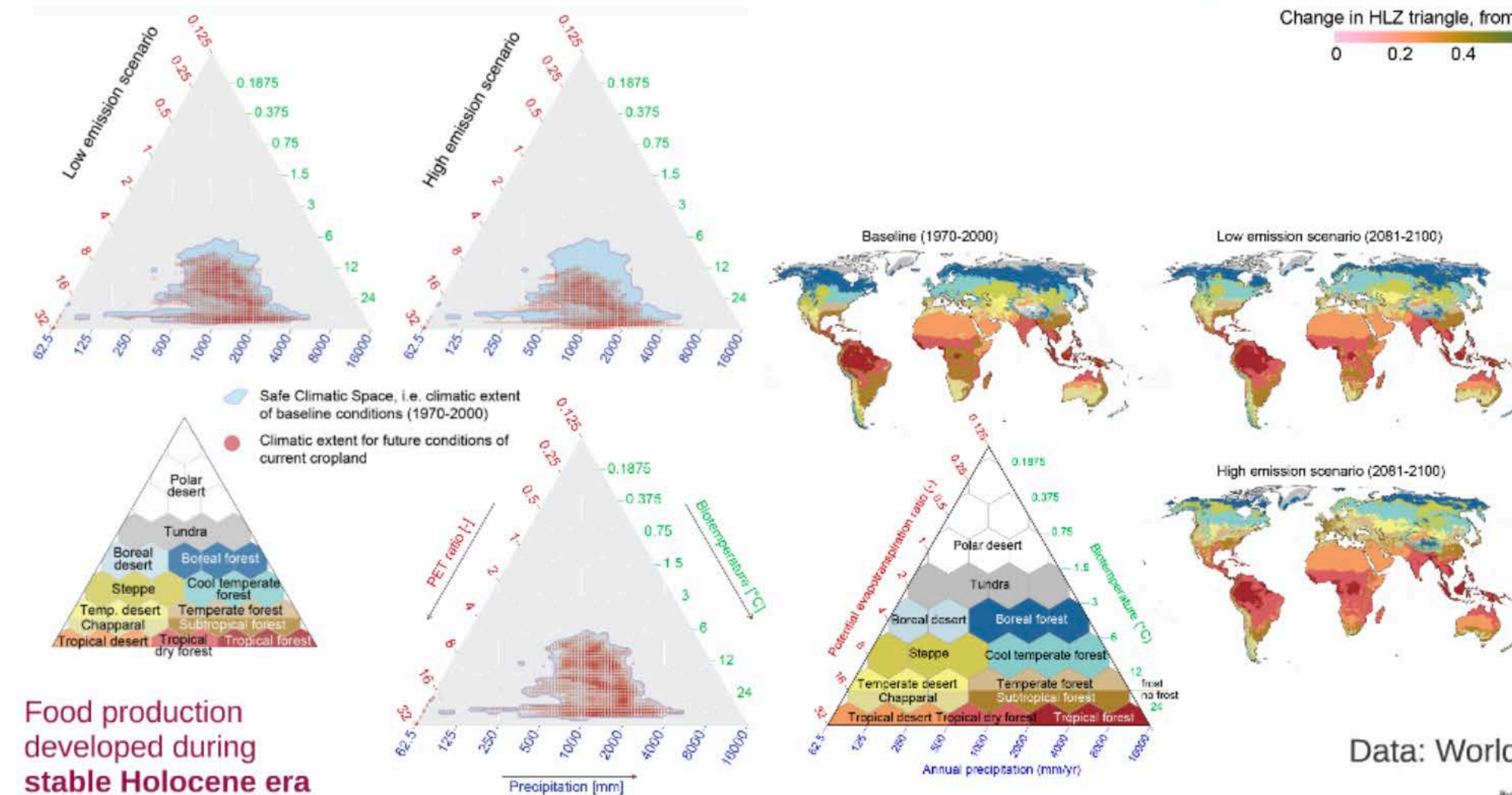


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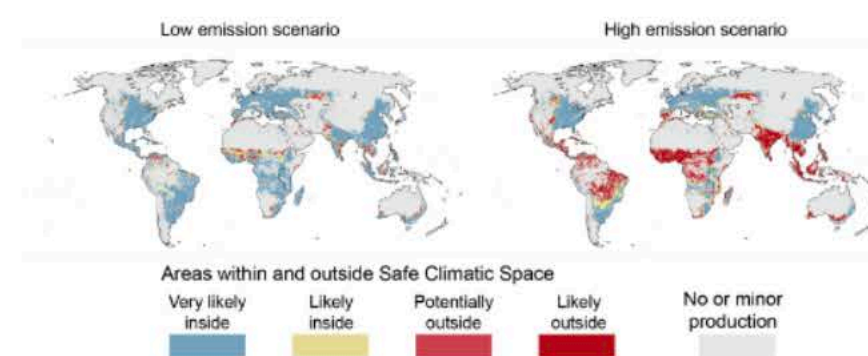
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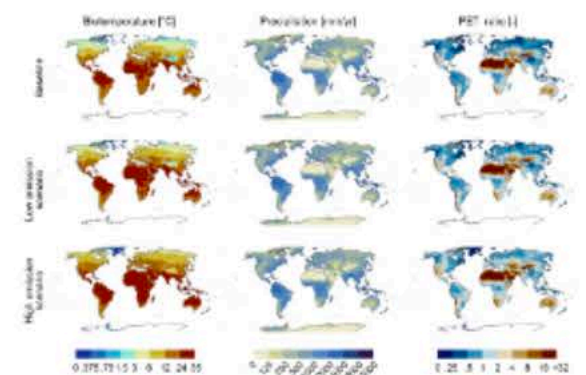
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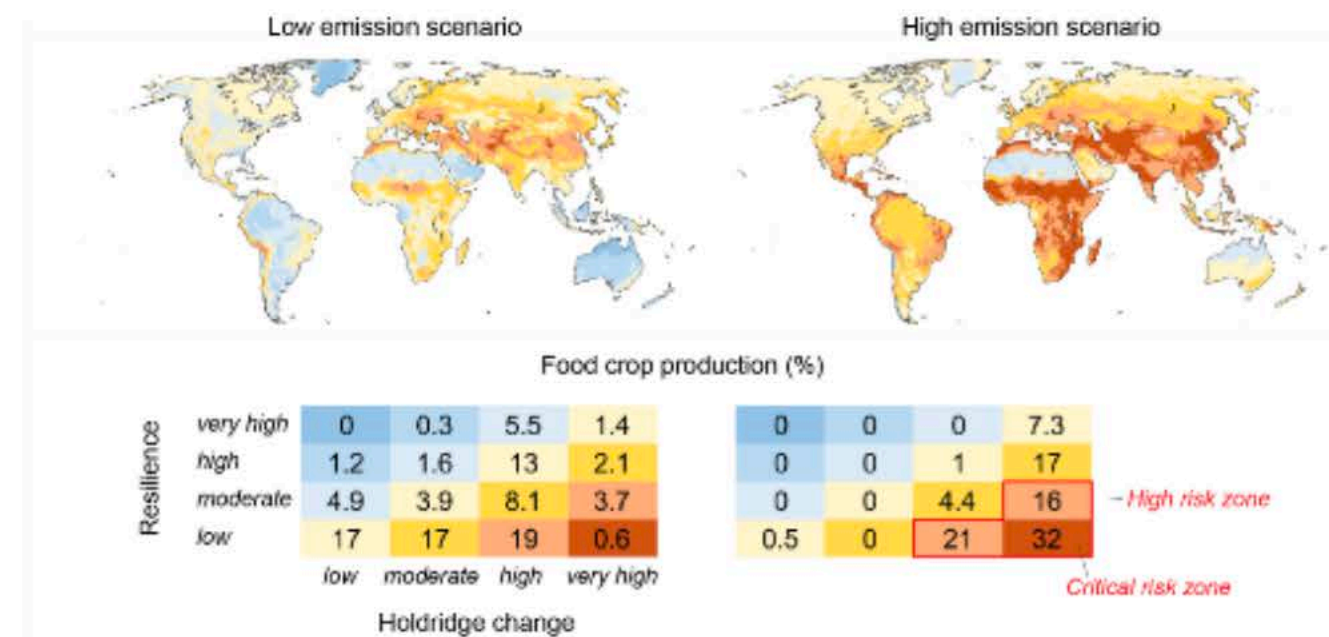


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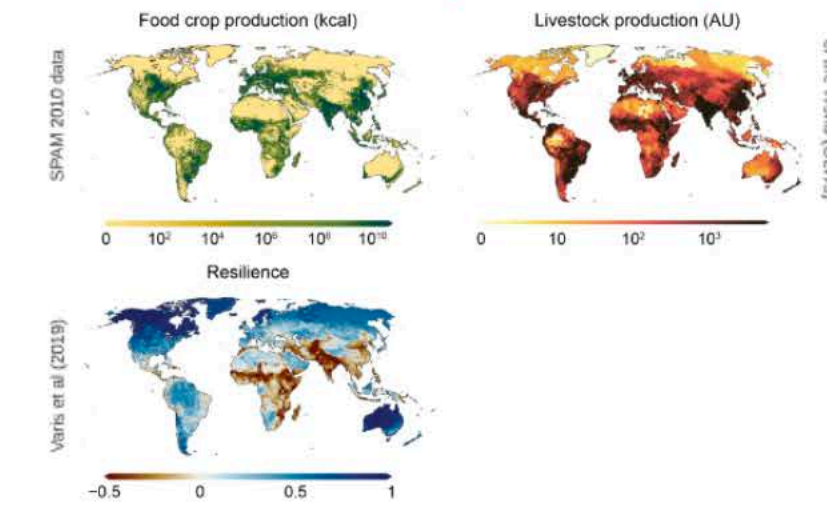


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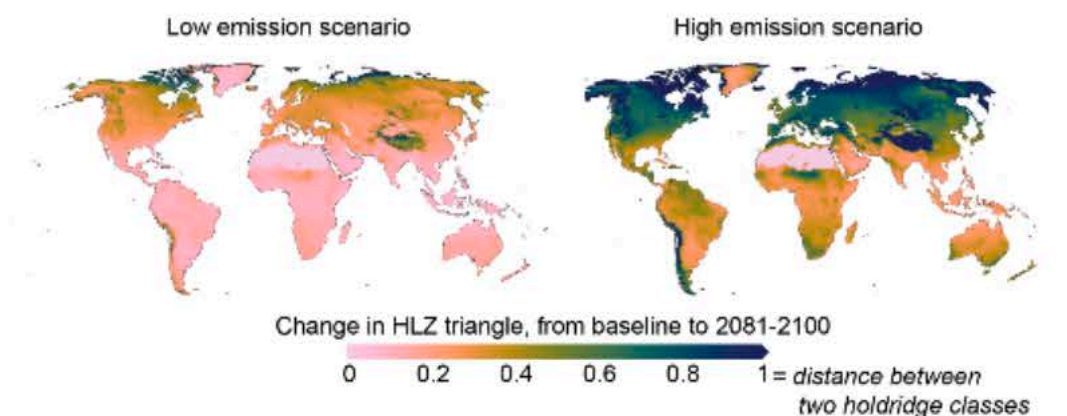
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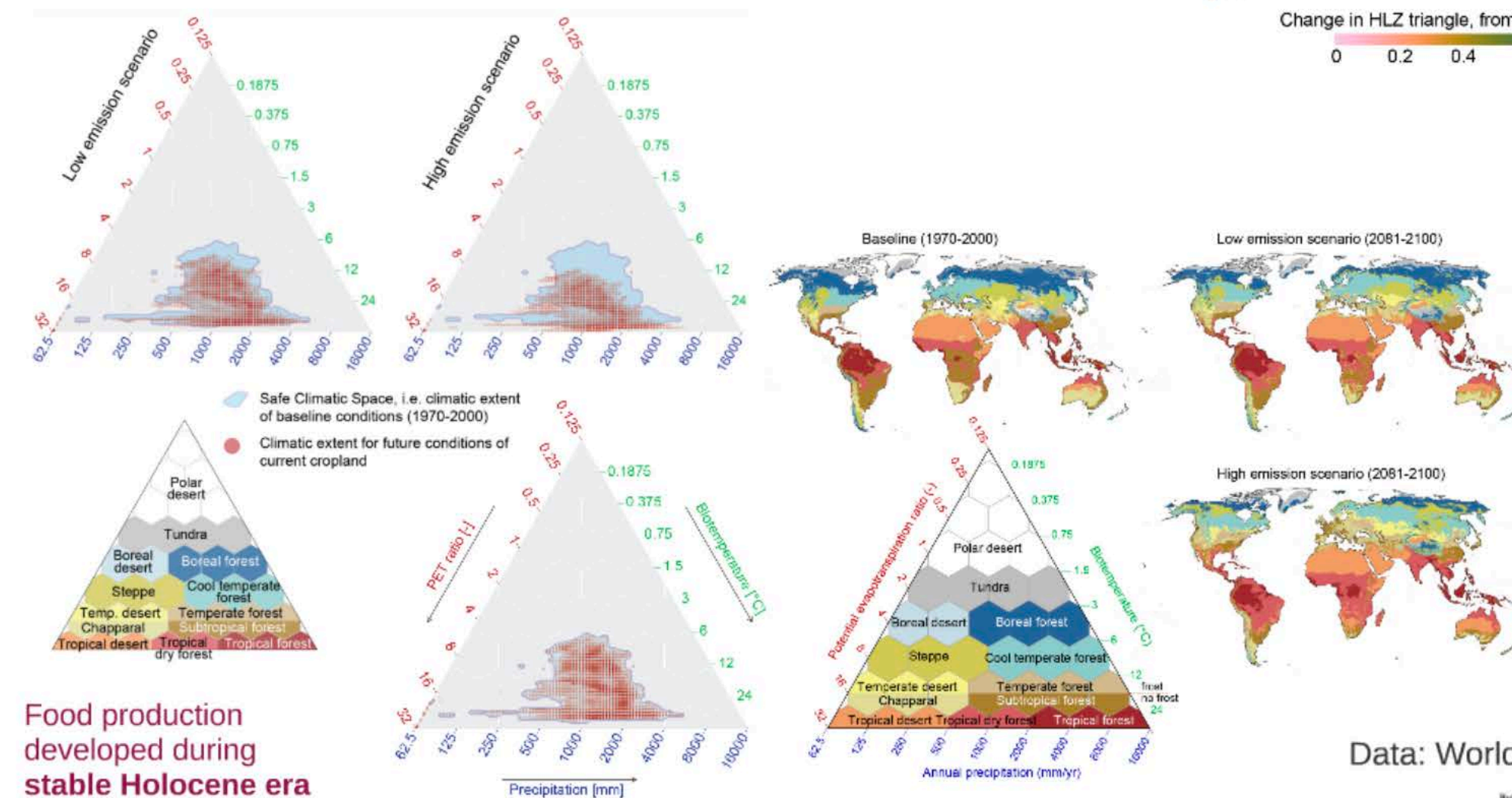


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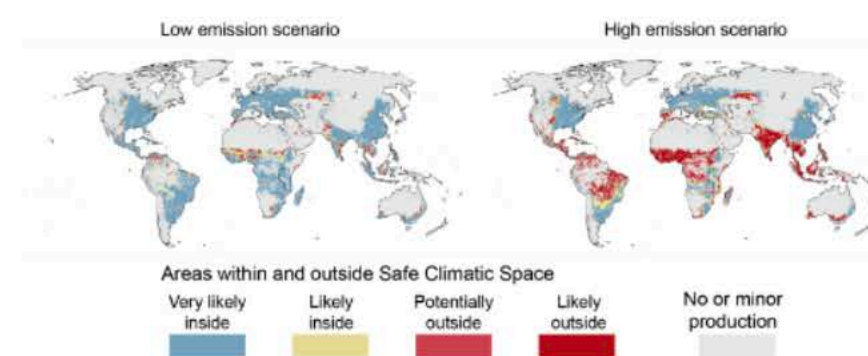
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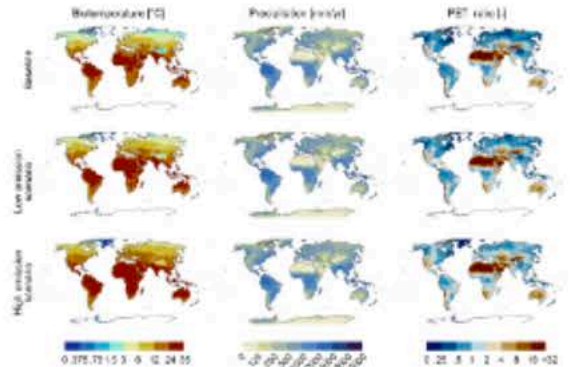
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Thank you!