

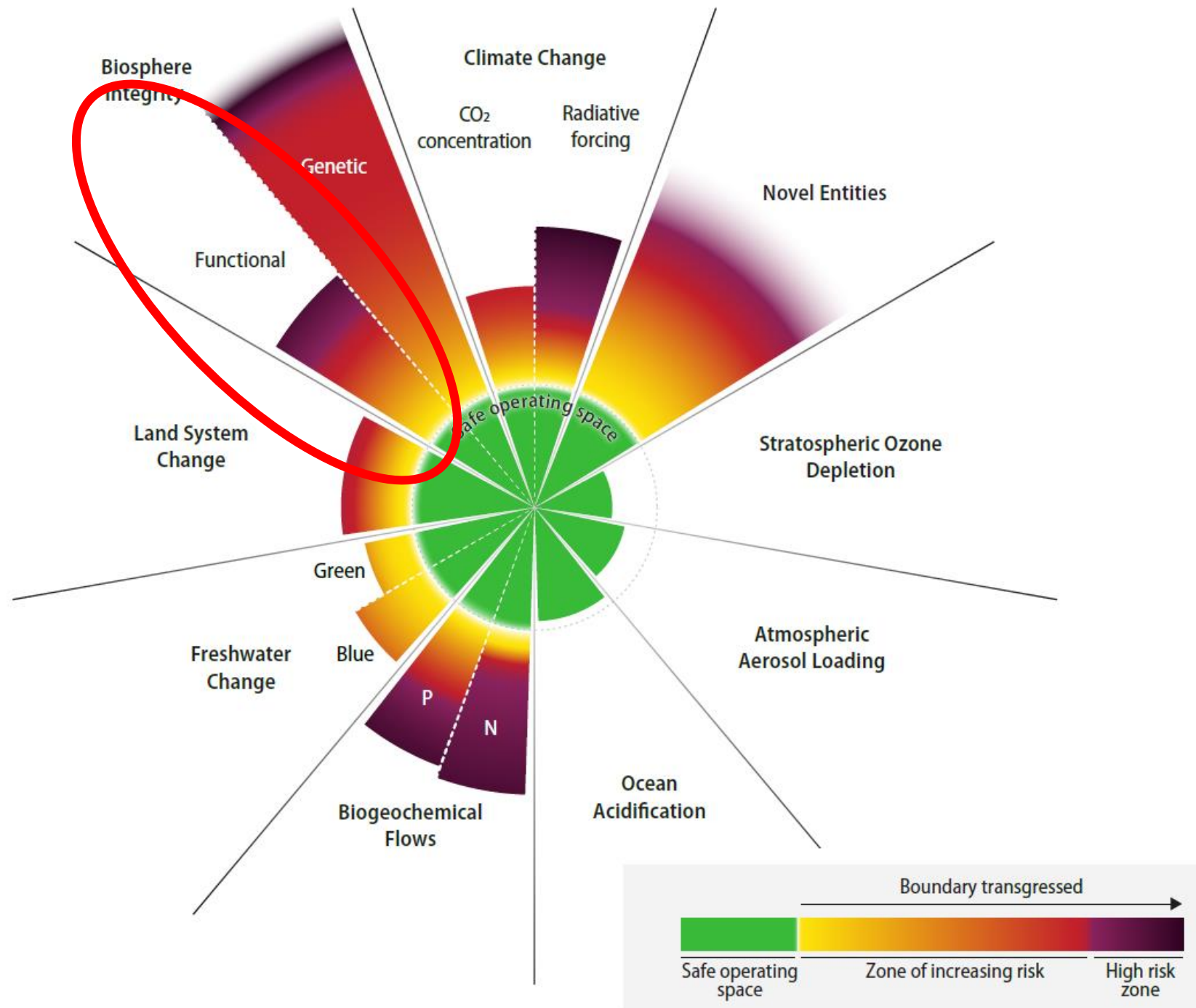


How far have we come in exceeding our planetary boundaries?

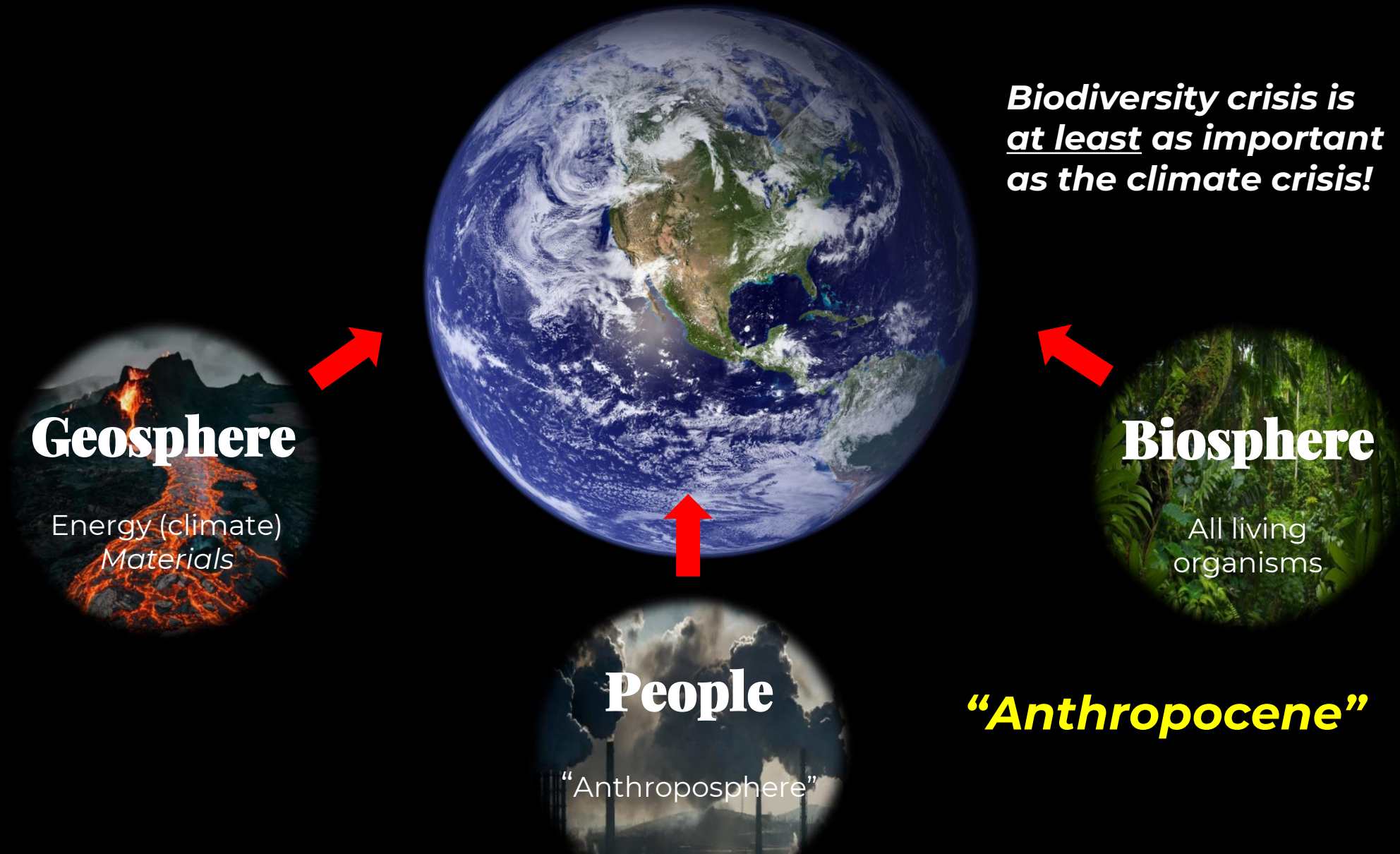
Katherine Richardson, Professor

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For billions of years, it was only the interactions between the “Geosphere” (energy and materials) and the “Biosphere” that determined conditions on Earth!



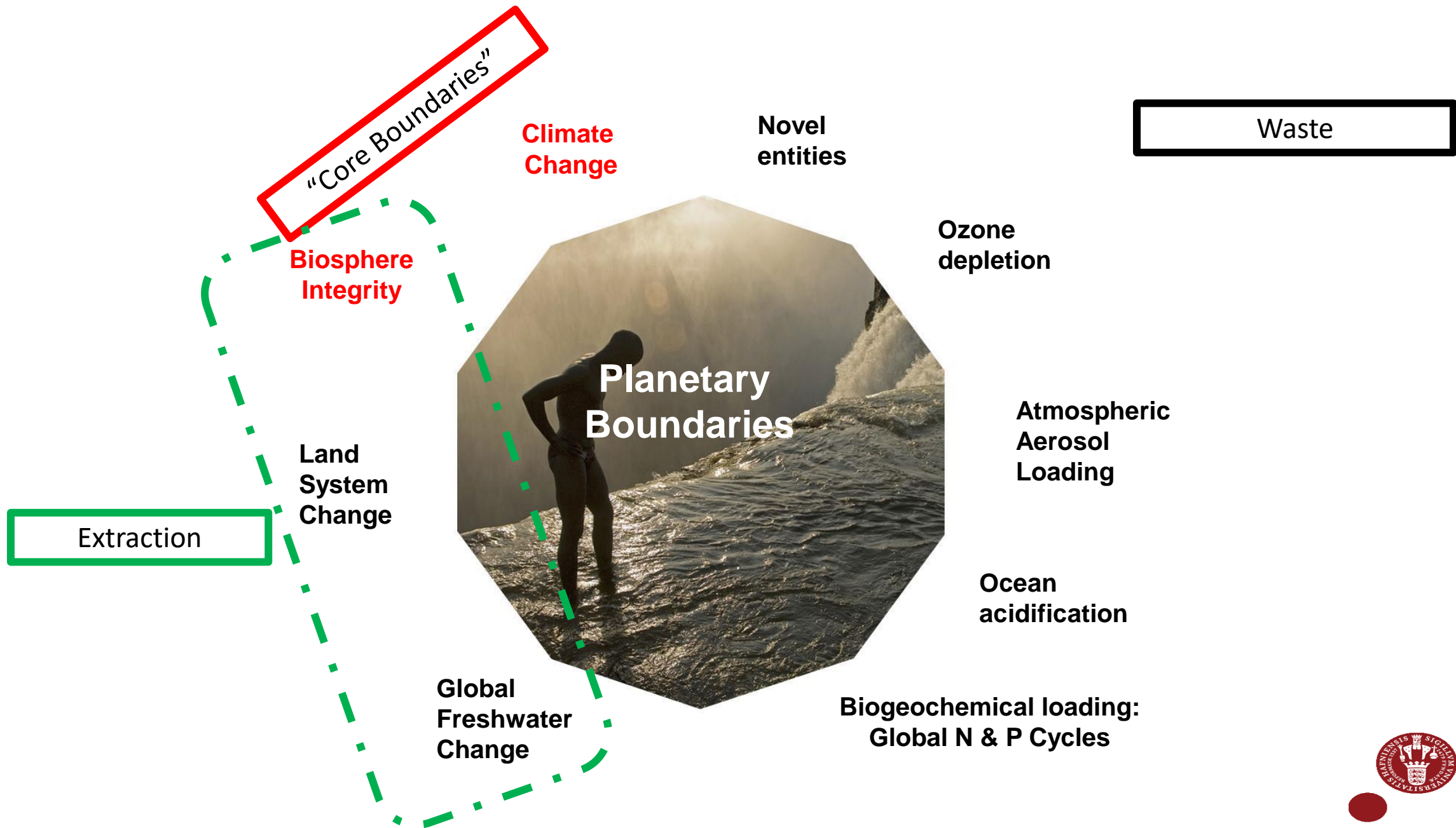
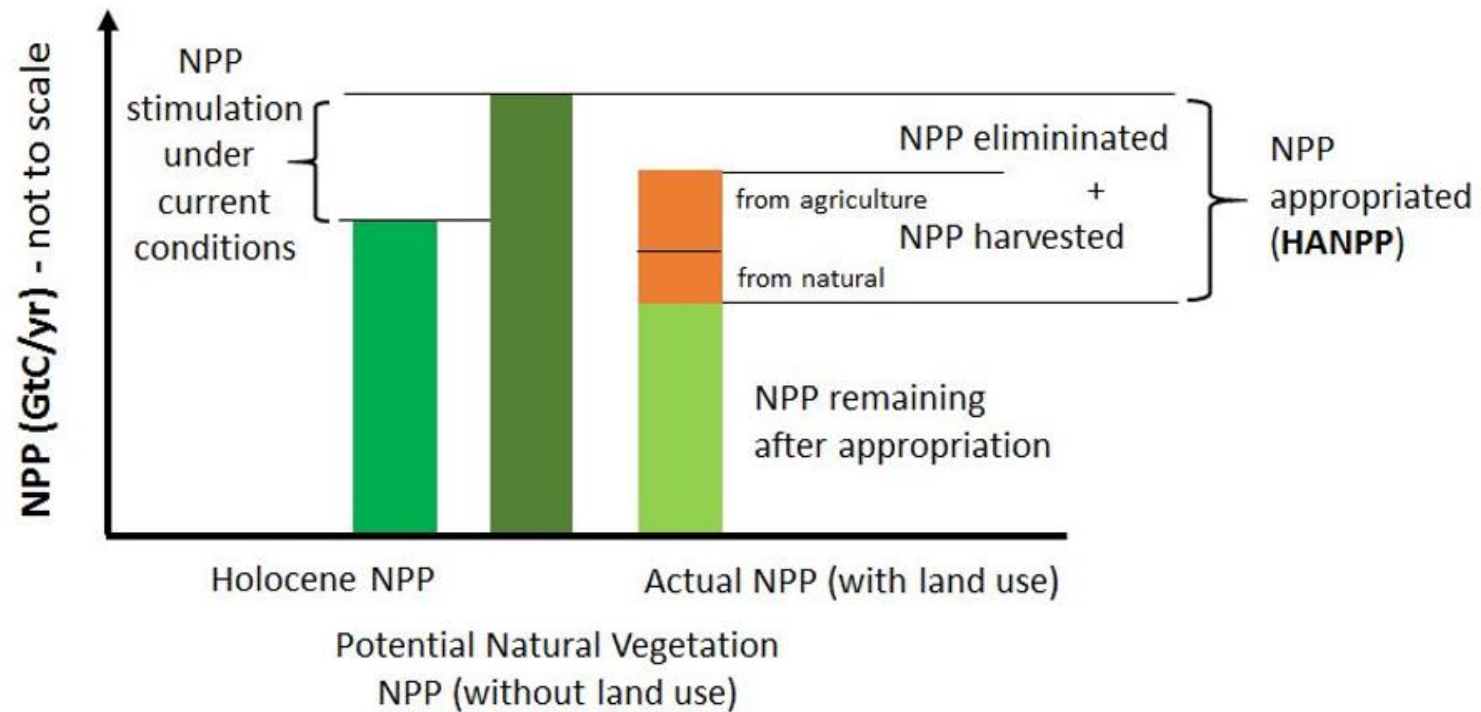
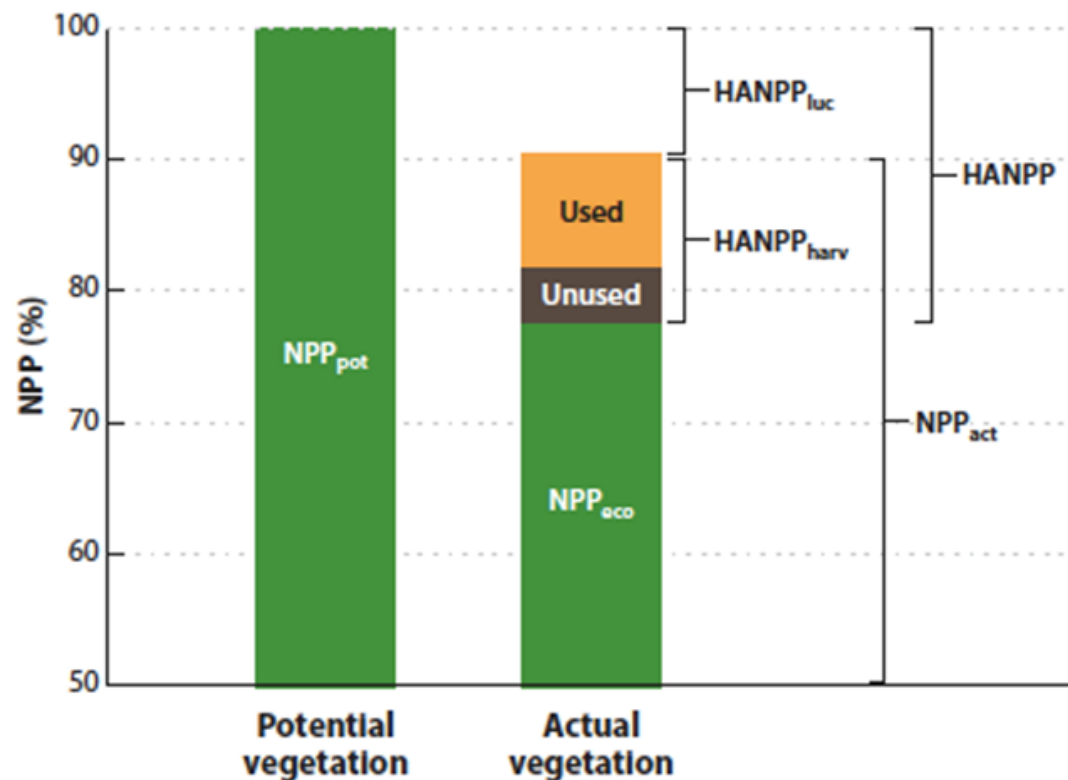


Fig. S2. Schematic of the definition of HANPP used in this study (not to scale; adapted from (33)).



We are using 1/3 of the energy historically available to nature!



Human reduction of NPP at global level (Haberl et al. 2014).

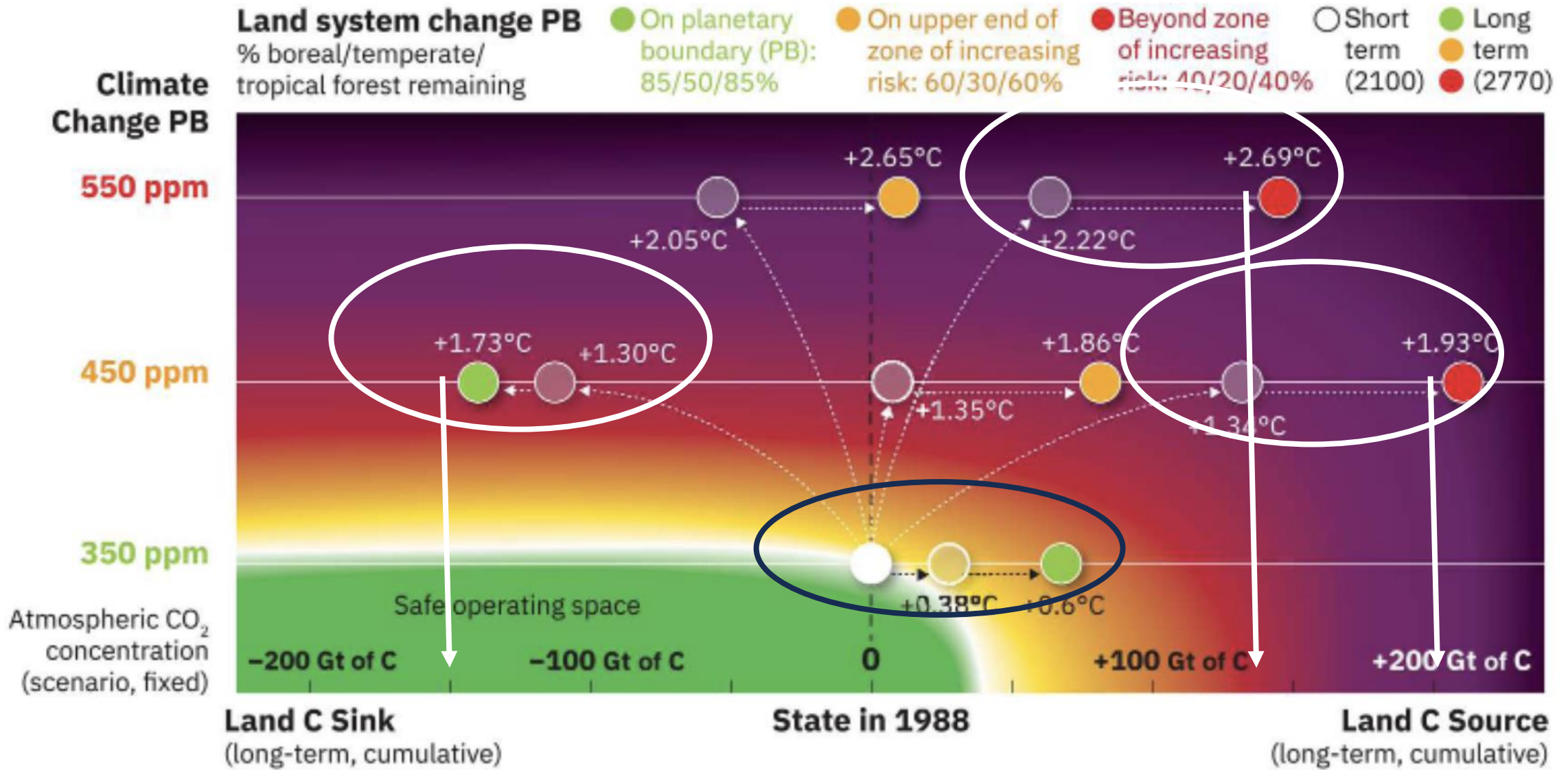
The Earth's primary production is the energy source supporting living organisms

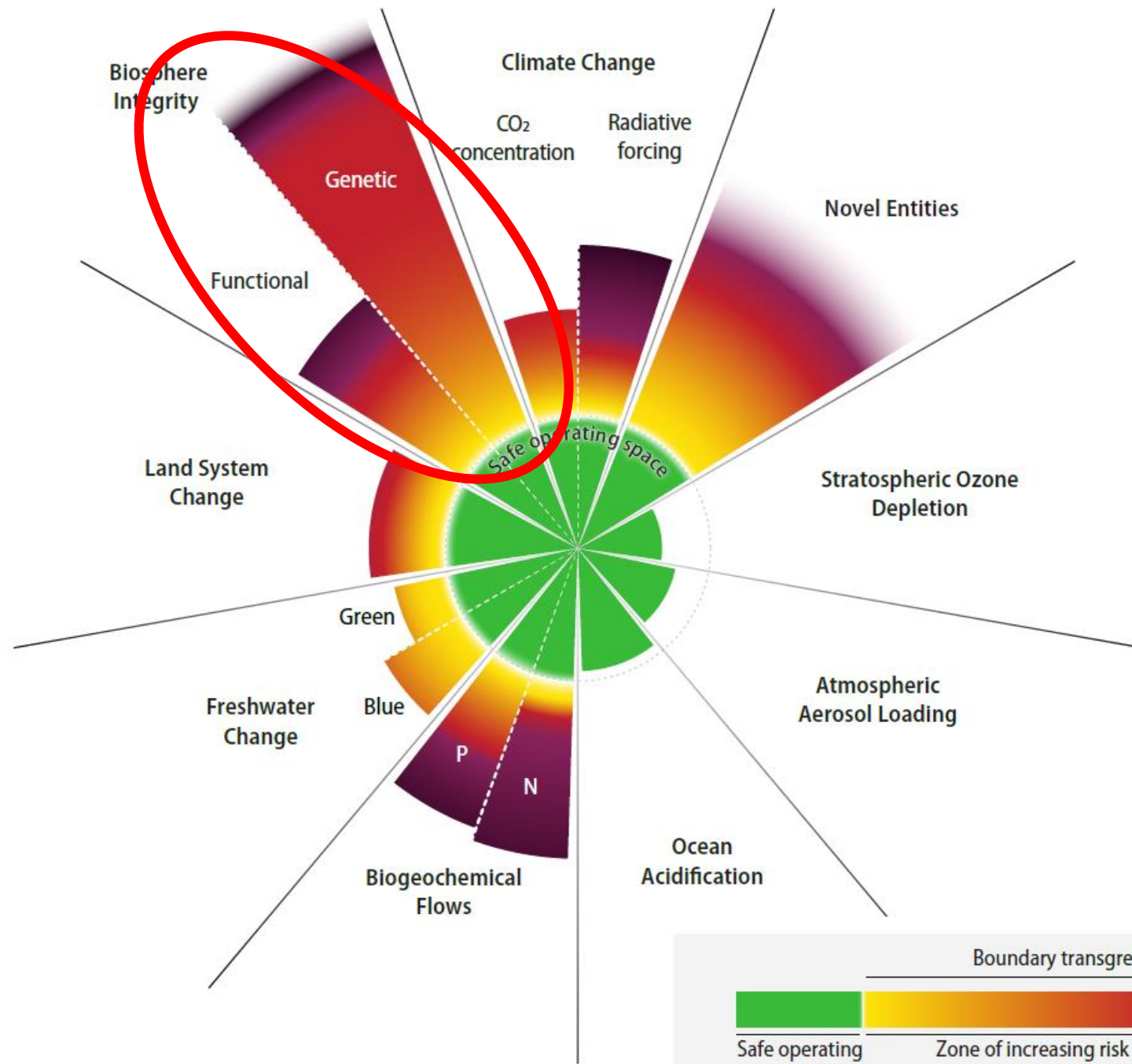
Converting biomass to "external" energy reduces the energy available to support life!

An aerial photograph of a dense, lush green forest, likely a coniferous forest, filling the entire frame. The trees are tightly packed, creating a textured, green canopy. The lighting is bright, highlighting the vibrant green of the foliage.

Modelled interactions between deforestation and climate:

**Unlikely to meet the Paris
Agreement goals unless
deforestation is stopped!**





Transgression of the **Biosphere Integrity boundary** is at least as great as transgression of the **Climate Change Boundary!**