

# The 9 planetary boundaries

To keep Earth hospitable, we need to live within 9 specific limits. Here's how we're doing in 2015.

	BOUNDARY	WHERE WE ARE TODAY
1. <b>Climate change</b>	Atmospheric concentrations of carbon dioxide at no more than 350 ppm	Carbon dioxide levels are at 400 ppm and climbing
2. <b>Lost biodiversity as species become extinct</b>	Maintain 90% of biodiversity	Biodiversity has dropped to 84% in parts of the world such as Africa
3. <b>The addition of phosphorus, nitrogen (and other elements) to the world's crops and ecosystems</b>	Worldwide use per year of about 11 teragrams (Tg) of phosphorus and 62 Tg of nitrogen	Up to about 22 Tg per year of phosphorus and 150 Tg of nitrogen
4. <b>Deforestation and other land use changes</b>	Maintain 75% of the planet's original forests	Down to 62%
5. <b>Emission of aerosols (microscopic particles) into the atmosphere that affect climate and living organisms</b>	Global boundary unknown, but regional effects (such as on the South Asian Monsoon) occur when Aerosol Optical Depth (AOD) is more than 0.25	Up to 0.30 AOD over South Asia, but probably well inside (or below) the boundary over most of the globe
6. <b>Stratospheric ozone depletion</b>	Less than 5% below pre-industrial level of about 290 Dobson Units (DU)	Still safely inside the boundary except over Antarctica during spring, when levels drop to 200 DU
7. <b>Ocean acidification</b>	When the oceans become acidic enough that the minerals sea creatures need to make shells, such as aragonite, begin to dissolve	Still within the boundary, which won't be crossed if we can stay within the climate boundary of 350ppm of CO <sub>2</sub> in the atmosphere
8. <b>Freshwater use</b>	Can use up to 4000km <sup>3</sup> of freshwater a year	We use around 2600 km <sup>3</sup> of freshwater per year
9. <b>Dumping of organic pollutants, radioactive materials, nanomaterials, micro-plastics, and other novel or man-made substances into the world's environment</b>	Unknown	Unknown