

EARTH COMMISSION EXPLAINER BRIEF

FRESHWATER

PROTECTING FRESHWATER RESOURCES TO ENSURE A SAFE AND JUST FUTURE FOR ALL

Freshwater is essential to life on Earth. Human activities have contaminated and destabilised our water systems. A lack of freshwater leads to crop shortages, food and drink shortages, and economic decline. Adequate sanitation is threatened, leading to an increase in deadly water-borne illnesses. We must act now to ensure a safe and just future for humanity.

WHAT ARE EARTH SYSTEM BOUNDARIES?

The groundbreaking Earth System Boundaries (ESBs), identified by the Earth Commission, are scientifically quantified safe and just limits for climate, freshwater, biodiversity, nutrient cycles and aerosol pollutants.

They delineate a long-term *corridor* for humanity on a global scale – a *safe and just zone for people and planet*. By operating within these limits, we can maintain a stable and resilient planet and ensure access for everyone to the resources necessary for a dignified life.

Earth System Boundaries are hard limits. Even temporary overshooting of some of the boundaries can permanently damage the planet's critical systems, causing irreparable harm to life.

Earth System Boundaries can guide action towards a safe and just future for every human and the planetary web of life we rely on.

- *Safe* boundaries ensure stable and resilient conditions on Earth, within the Holocene range of variability, that we know can support human development.

- *Just* boundaries minimize human and nature's exposure to significant harm. In addition, the Earth Commission quantified minimum levels for access to resources for a dignified life and freedom from poverty for everyone.

WHAT DOES THE EARTH COMMISSION SAY ABOUT FRESHWATER?

We are taking colossal risks with our use of freshwater. Healthy freshwater environments sustain important fisheries and provide water for drinking, growing crops, and generating power. Their fringing vegetation also prevents erosion and provides natural protection from floods. The Earth Commission's findings are informed by flow-ecology research.

Flow alterations to freshwater systems occur through the damming of rivers, the direct extraction of water from rivers and / or lakes, and other water resource developments. Flow alteration is the primary cause of reductions in aquatic ecosystem health. It leads to reduced water quality, natural habitat and biodiversity losses. Dams also trap sediment and many river deltas are starved of their sediment replenishment that keeps them above sea level.

Much of the water we use for drinking, sanitation and agriculture comes from groundwater. Life would be impossible without it. Surface water flows are often dependent on groundwater. Extracting too much groundwater can affect the flow of rivers and streams. Overextraction puts agricultural production at great risk and can lead to irreversible land subsidence.

Although we have already breached the safe and just boundaries for freshwater, with long lasting impacts, the damage can be reversed: it is possible to move within the safe and just corridor for freshwater.

WHAT ARE THE KEY INSIGHTS WE CAN DRAW FROM THE EARTH SYSTEM BOUNDARIES FOR FRESHWATER?

- The Earth Commission has quantified safe and just Earth System Boundaries for Freshwater for both surface and groundwater (often referred to as ‘blue’ water).
- Groundwater, often from rainfall or snowmelt that has soaked into soil and rocks, exists deep below the Earth’s surface. Surface water includes any freshwater that flows into streams, lakes, and wetlands. These make up less than 1% of the world’s surface, and yet they host extraordinary biodiversity.
- *The ‘Safe’ boundary for surface water is to ensure we do not alter natural flows in river systems by more than 20%. The boundary is already significantly breached.*
- *The Safe and Just boundary for surface water globally, also requires ensuring flows in river systems in all local catchment areas are not altered by more than 20%. This boundary has been significantly breached. Natural water flows on over a third (34%) of all areas of land around the world have been altered - by dams, drainage or other kinds of human interventions - by more than 20%.*
- *The ‘Safe’ boundary for groundwater is for the annual extraction not to exceed the annual average replenishment for that specific regional groundwater source.*

- *The Safe and Just boundary for groundwater is the same measurement as the ‘Safe’ for groundwater because it protects groundwater dependent local ecosystems - like springs, wetlands and many farms - as well as rivers that depend on groundwater. This boundary has been significantly breached. Almost half (47%) of all areas of land containing river basins are beyond the boundary: i.e. more water is being extracted per year than is replenished naturally.*
- *Meeting the surface and groundwater ESBs will protect ecosystems and ecosystem services that healthy aquatic ecosystems provide.*

WHAT CAN YOU DO?

Freshwater systems are crucial for the well-being of people and the planet. Our resources are precious. We must stay within *safe and just boundaries for surface water and groundwater*. We must examine the impact of human activity on freshwater flow. We must protect freshwater ecosystems. *We can and must take action now.*

The Earth Commission is part of a bigger system of changemakers: the Global Commons Alliance, which created the Science Based Targets Network (SBTN) to translate scientific boundaries into science-based-targets (SBTs). Businesses and decision makers can work with SBTs for Nature as part of their commitment to stay within the safe and just boundaries, across all sectors of the economy.

The ambition of the first phase of science-based targets for nature, just released by SBTN, is aligned with the Earth Commissions scientific findings. Building on existing environmental knowledge and aligned with local ambitions, these targets, including science-based targets for climate, will put businesses, cities and policy-makers on the right path so that we move towards a safe and just space for people and the planet.

Read more at earthcommission.org