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International Earth System Monitoring

Enhancing International Earth System Monitoring Capacity to Inform Global Decision-Making on Earth System Management

CLIMATE GOVERNANCE COMMISSION

MEGA Mobilizing an Earth Governance Alliance

WORLD FEDERALIST MOVEMENT INSTITUTE FOR GLOBAL POLICY

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There is an urgent need to improve the coordination of science and policy at the international level: in particular, to integrate Earth system and Planetary Boundaries science into global policy and decision-making. Key governance innovations can bridge this science-policy gap.

The Gap Between Science, International Policymaking, and Monitoring/Reporting of Earth System Risks

The Earth's Planetary Boundaries define the maximum human-induced disruption each of the planet's 'spheres' (the Planet's major natural subsystems)[1] can sustain before the overall Earth system[2] becomes unstable, risking irreversible changes and cascading effects. Ensuring a stable global climate is interdependent with the health of multiple Planetary Boundaries.[3] Transgressing these boundaries, seven of nine of which have already been crossed, may trigger abrupt and non-linear shifts, posing significant threats to human well-being and survival due to the tipping points associated with the boundaries.[4] Therefore, keeping human impact and activity within Planetary Boundaries must become a priority for international policymaking, with particular emphasis on the consequences to health, well-being, the economy, and global society of not remaining within these boundaries.[5]

To guide decision-makers in this area, new and enhanced interlinked scientific advisory panels — or one consolidated panel — will be needed to monitor and advise, in real time, on Earth system risks and effectively inform decision-makers to protect vital aspects of the public interest.[6]

Current assessment bodies, including the Intergovernmental Panel on Climate Change (IPCC) for the UN Framework Convention on Climate Change (UNFCCC), and the Global Environment Outlook (GEO) of the UN Environment Programme (UNEP) are only beginning to consider Planetary Boundaries. As an example, the IPCC has played a vital role in reviewing and publicizing climate science to key policymakers and stakeholders at a global level. However, the IPCC is backward-looking, relying on previously published research and issuing reports generally only every five to seven years, with a limited number of special reports. Furthermore, it lacks a mandate to advise policymakers on actions to ensure policy is science-led and oriented toward the mitigation of Earth system risks — though it can offer guidance for policymakers on the implications of the latest scientific research for climate policy.[7] The IPCC has not been mandated to advise on the risks of exceeding Planetary Boundaries or the crossing of various planetary tipping points, nor is any other international body currently tasked with these duties.[8]

These gaps make it challenging for policymakers to understand current Earth system and Planetary Boundary risks, and to implement the science-led policies that are essential to safeguarding human interests. To remedy this, new efforts are needed to build on the work of the IPCC, IPBES, and other existing scientific assessment bodies and tools,[9] to effectively enhance international Earth system monitoring capacity — which importantly, should be endowed with *anticipatory and future risk-forecasting capacities*.

Establishing a Science-Policy Action Network (SPAN)

As a first step toward bridging the gap between Earth system science and policy, the UN High-Level Advisory Board on Effective Multilateralism (HLAB) recommended that the UNEP and its governing body, the UN Environment Assembly (UNEA), be resourced to support a Science-Policy-Action Network (SPAN). SPAN would integrate information regarding the "triple planetary crisis"[10] into a coherent, continuously updated assessment of risks, and offer clear, actionable recommendations for policymakers.

SPAN could track climate and nature issues and progress "in real time," trace environmental and security impacts, and issue country-specific reports designed to improve policy decision-making. It could use this data to suggest science-driven policies on how best to ensure that Planetary Boundaries are restored, maintained, and not further compromised.[11] It could work with and support a global hub for preserving and transferring Indigenous knowledge, and have the resources to build adaptation and green technological capacities in low-income countries.[12]

SPAN could also oversee strengthened global collection of the necessary environmental, social, and economic data to fill gaps in coverage and to build the scientific capacity for participation everywhere. A SPAN-type facility could mature into a standing and comprehensive international Earth system monitoring and reporting facility (e.g., drawing from/connected to regional monitoring and reporting facilities centered around major Tipping Elements and/or bioregions). The facility could directly report to and advise international bodies, and decision-makers at all levels of governance, in an agile and anticipatory way, to ensure that the best available Earth system science and policy advice was at the disposal of all governments and other actors, safeguarding common well-being. These measures would help bridge gaps between international policymaking and scientific communities, place new emphasis on the human and social dimension of Earth system science, and de-fragment the global response to the "triple planetary crisis" to ensure we mobilize the data needed for effective and equitable Earth system policy.

Next Steps: Building the Political Momentum for Enhancing International Earth System Monitoring and Risk Assessment

The Climate Governance Commission and MEGA are seeking to work closely with all interested states and relevant stakeholders to develop a "smart coalition" of global civil society and like-minded governments to encourage and advocate for the enhancement of international Earth system monitoring capacity. Critical to the work will be a shift in how we frame the link between international monitoring capacity and effective global policymaking. Emphasis will be placed on the importance of mobilizing Earth system data through ensuring sufficient international monitoring and reporting capacity in order to safeguard economic prosperity and well-being for all.

This policy work is an evolving and iterative process. We are constantly adapting our research, communications, and coalition-building to the evolving international landscape and the related challenges and opportunities. Version: April 2026.

Who We Are

The Climate Governance Commission (CGC) works to fill a crucial gap in confronting the planetary emergency of climate change, biodiversity loss, and pollution by developing and advancing feasible, high-impact global governance solutions to enable urgent and effective action to limit global temperature rise to 1.5°C or less, and to tackle broader Earth system risks. Co-chaired by Mary Robinson (former President of Ireland and Chair of The Elders), Maria Fernanda Espinosa (73rd President of the UN General Assembly), and Johan Rockström (Director of the Potsdam Institute for Climate Impact Research), the Commission brings together climate scientists, former heads of state, civil society leaders, and other experts to operationalise solutions outlined in its flagship report, Governing Our Planetary Emergency.

The World Federalist Movement - Institute for Global Policy (WFM-IGP) seeks to create more effective, equitable, and accountable global governance. It does this by strengthening existing governance mechanisms and establishing new ones.

Mobilizing an Earth Governance Alliance (MEGA) is hosted by the CGC and the WFM-IGP and is a global coalition working to address climate change and environmental collapse by strengthening the governance of the Earth system at the international level. It draws from the seminal CGC report, Governing our Planetary Emergency, and works with the CGC and partners to bring together experts across sectors to advance practical, evidence-based reforms. MEGA identifies governance gaps, take forward actionable reform proposals, and mobilizes coalitions to concretely support and inform global decision-making.

Endnotes

1 Tim Lenton, *Earth System Science: A Very Short Introduction* (Oxford Academic, 2016).

2 Lenton, *Earth System Science*.

3 Planetary Boundaries Science (PBScience), Planetary Health Check 2025 (Potsdam Institute for Climate Impact Research (PIK), 2025); Maja Groff and Mary Robinson et al., *Governing our Planetary Emergency* (Climate Governance Commission, 2023), 17–23.

4 PBScience, *Planetary Health Check 2025*.

5 Detlef P. van Vuuren et al., "Exploring Pathways for World Development Within Planetary Boundaries," *Nature* 641 (2025): 910–916.

6 Groff, Robinson et al., *Governing Our Planetary Emergency*, 47–48.

7 David Obura, *Responding to Earth System Risk in the Global Multilateral System* (Global Challenges Foundation, 2023), 8.

8 PBScience, *Planetary Health Check 2025*.

9 Global Commons Alliance, "Safe and Just Earth System Boundaries," accessed December 1, 2025; Johan Rockström et al., "Safe and Just Earth System Boundaries," *Nature* 619 (2023): 102–111.

10 UN Framework Convention on Climate Change, "What is the Triple Planetary Crisis," accessed December 1, 2025.

11 High-Level Advisory Board on Effective Multilateralism, A Breakthrough for People and Planet: Effective and Inclusive Global Governance for Today and the Future (United Nations University, 2023), 26–27.

12 Groff, Robinson et al., Governing Our Planetary Emergency,, 48–49.