



# Climatic changes in atmosphere and ecosystem forum

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## DESCRIPTION

The rapid anthropogenic climate change are witnessing in the early twenty-first century is inextricably linked to the health and function of the biosphere. Climate change is affecting ecosystems through changes in mean conditions and variability, as well as other associated changes such as increased ocean acidification and atmospheric CO<sub>2</sub> concentrations. It also interacts with other ecosystem pressures such as degradation, defaunation, and fragmentation. Understanding the ecological dynamics of these climate impacts, identifying hotspots of vulnerability and resilience, and identifying management interventions that may aid biosphere resilience to climate change are all necessary.

At the same time, ecosystems can help with climate change mitigation and adaptation. The mechanisms, potential, and limits of such nature-based climate change solutions must be investigated and quantified. Changes in the atmosphere and oceans can have a significant impact on the biosphere, the thin living film of life on earth that is inextricably linked to the atmosphere and hydrosphere and serves as the nourishing fabric for human societies. As a result, the degradation or restoration of parts of the biosphere is likely to have regional or global implications.

Anthropogenic greenhouse gas emissions, which drive both climate change and ocean acidification, are putting natural ecosystems and the human societies that rely on them in jeopardy. The consequences of these threats can be severe, and they have become more visible in recent years. Earth has already committed to a significantly warmed climate, with further warming expected in the future unless carbon emission trajectories change dramatically. Scientific research continues to improve our understanding of the Earth's climate system and its relationship with the biosphere. Climate change projections, for the most part, indicate an increased likelihood of negative consequences for ecosystems and

people. Climate-related impacts are already being observed, and their severity and frequency appear to be increasing.

A number of potential climate tipping points in the earth system have already begun to activate. A 1.5°C maximum warming ambition implies that the world has about 12 years to cut global net carbon emissions in half to avoid the most significant impacts, but even if this target is met, potential warming impacts are likely to last for decades, if not centuries. The Forum's goals were to create new opportunities for international collaboration, highlight the most recent research findings on the focal topic, identify research gaps and future research priorities, and discuss how research in this field can inform international policy.

The forum studied the latest scientific knowledge on how climate change may affect terrestrial, aquatic and marine ecosystems, often with interactions with other factors. In particular, they mentioned research frontiers such as the impact of change in climate change and extreme events; interactions between certain stressors; threshold and possibility of sudden changes; and multi nutrient interactions, across a wide range of terrestrial, aquatic and marine ecosystems. The forum also explores opportunities to support and manage ecosystems to improve their resilience and society's resilience to climate change by exploring the many scientific.

This includes how best to manage ecosystems to improve their resilience to climate change, their ability to transform under climate change, and how managing ecosystems can be a broader adaptation strategy to change. The focus is therefore on how ecosystem management and restoration has the potential to contribute to 'Nature-Based Solutions' (NBS) to address both the causes and consequences of climate change. However, the effectiveness, scalability, and scale of strategies based on different natures need to be explored, better understood, and evaluated.