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Title: The Anthropocene: Rising Risks, Critical Choices

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Abstract

Human-driven changes to the structure and functioning of the Earth System at the planetary level are now well-established. The climate system is being destabilised and Earth's biosphere is heading towards its sixth great extinction event. Novel materials created by humans – plastics, aluminium, radionuclides, and thousands of chemicals – are now being poured into the Earth System at accelerating rates. These, and other changes, have prompted Earth System scientists to propose that the system has been driven out of the Holocene, the most recent 11,700-year period of relative stability, and onto a new trajectory called the Anthropocene, a trajectory of increasing instability, growing risks, and more frequent disruptions. The geological community, via the Anthropocene Working Group, has recommended that the Anthropocene be formally accepted at the epoch level as a potential new unit in the Geological Time Scale. A mid-20th century start date is proposed for the Anthropocene. The search is now on for a suitable GSSP (Global Boundary Stratotype Section and Point) to provide the stratigraphical marker needed to formalise the Anthropocene.

Perhaps the most striking implication of the Anthropocene is that it is putting geology at the centre of a profound challenge to society. Is all of humanity responsible for the Anthropocene? What are the risks and opportunities that the Anthropocene brings? What changes in human societies are required to steer the Anthropocene onto a more sustainable pathway? What are the consequences of the current trajectory of the Anthropocene? Although no one can yet project the future trajectory of the Anthropocene with any certainty, potential risks are beginning to emerge. The most important of these are tipping points in the Earth System that, if thresholds are crossed, could take the trajectory out of human control and onto a pathway towards a much hotter planet, with higher sea levels and a much less diverse biosphere. The risks of the Anthropocene are coming into sharper focus, with critical choices for humanity looming ahead.

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