

THE EARTH SYSTEM AND A CHANGING WORLD: GEOLOGICAL PROCESSES, HUMANI AND THE FUTURE SESSION

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The Earth is a dynamic system in which change is the rule rather than the exception, and physical, biological, and human processes are in continuous interaction. While plate movements, climatic fluctuations, geochemical cycles, and surface processes shape the planet's physical framework; the evolution of life, particularly the formative relationship between humans and nature, social structures and settlement patterns have collectively influenced one another across varying spatial and temporal scales to form the present appearance of our planet. The geological archives preserved in rocks, sediments, landforms, and biological records, together with human records documented in cultural and historical sources, enable us to understand the rates, magnitudes, continuity, and critical thresholds of these interactions. Examining geological history and human history together is therefore essential not only for explaining how the Earth has changed, but also for evaluating the causes of contemporary ecological and human-driven transformations and developing scientific scenarios for the future.

Contemporary climate change, increasing pressure on natural resources, rapid and unplanned urbanization, radical transformations in land use, and environmental pollution are making the profound impact of human activities on the Earth system increasingly evident. These impacts are not merely one-directional interventions; rather, they unfold through complex feedback relationships involving climate, water, sediment, and ecosystem processes. Natural hazards such as earthquakes, landslides, floods, and coastal change can only be understood in their full risk dimensions when considered in conjunction with exposure and social vulnerability, and with contributions from disciplines beyond the geosciences. One of the fundamental questions facing the geosciences is how we can explain, on the basis of scientific evidence, a system in which natural variability and human-induced impacts are intertwined, and how the knowledge we generate can inform decisions about the future.

Anatolia and the Eastern Mediterranean constitute an important natural laboratory for investigating interactions within the Earth system, owing to their active tectonics, the convergence of climatic zones, rich geological and palaeoenvironmental archives, and long history of human settlement. This geography offers exceptional opportunities to bridge local observations with global processes, testing the impacts of geological change on the natural environment and human society across vastly different time scales. Nevertheless, our session also aims to bring findings from different parts of the world together within a shared scientific discussion.

Within the framework of the 79th Türkiye Geological Congress, whose main theme is "Geosciences in Addressing Global Challenges: Earth–Society–Future," the session "Earth System and a Changing World: Geological Processes, Humans, and the Future" invites original research and interdisciplinary studies that examine interactions among the geological, physical, chemical, and biological components of the Earth across different spatial and temporal scales. We particularly welcome contributions exploring the relationships between geological processes and climate, the water cycle, ecosystems, and human communities; studies that integrate geological records with contemporary observations; and research that establish meaningful connections among findings from different scientific disciplines. Our session aims to explore the possibilities of understanding the Earth not as a sum of independent processes, but as a system transforming through interconnected interactions. In this context, we seek not only to discuss how scientific knowledge of the Earth can help explain past changes, assess ongoing transformations, and inform thinking about the future, but also to examine the possibilities and limitations of bringing together knowledge from different fields.

We look forward to your valuable scientific contributions and to welcoming you to the Congress on 12–16 April 2027.