

ESM2025 project

The newly started EU H2020 ESM2025 project aims to develop the next generation of Earth System Models (ESMs). ESM2025 follows in the footsteps of the previously successful CRESCENDO project, taking a step forward in providing relevant climate simulations for the development of ambitious and realistic mitigation and adaptation strategies in line with the Paris Agreement.

ESM2025 will develop a new generation of ESMs through: (1) improving their representation of biogeochemical cycles, using state-of-the-art ESMs and observations, detailed theory and advanced machine learning techniques; (2) implementing new interactions and couplings between different components of the Earth system, enabling ESMs to run using emissions of major anthropogenic greenhouse gases (CO₂, CH₄ and N₂O), aerosols and their precursors, delivering an unprecedented holistic modelling framework to simulate future Earth system changes; (3) co-developing an innovative framework for linking Integrated Assessment Models (IAMs) and ESMs through improved consistency of their respective representations of climate and land use, enabling the development of geophysically-sound mitigation pathways.

The Max Planck Society, represented by three partner institutes, together with a world-leading European team of experts, will provide major contributions to all three main objectives. The new generation of ESMs and IAMs, which will be developed within ESM2025, will maintain Europe at the forefront of international efforts to model the Earth system and provide invaluable support to European climate policy and climate-related educational activities, as well as to climate services and future IPCC assessments.