

CRESCENDO brings together seven Earth System Modelling (ESM) groups with three Integrated Assessment Modelling teams, as well as experts in ESM evaluation, ESM projection and feedback analysis, climate impacts and science communication to address the following goals; (i) improve the process-realism and simulation-quality of European ESMs in order to increase the reliability of future Earth system projections; (ii) develop and apply a community ESM evaluation tool allowing routine ESM performance benchmarking, process-based ESM evaluation and the analysis of Earth system projections. The resulting tool will be installed and made openly-available on the Earth System Grid Federation (ESGF); (iii) further develop the discipline of emergent constraints in order to better constrain the representation of key biogeochemical and aerosol feedbacks in ESMs and thereby reduce overall uncertainty in Earth system projections; (iv) quantify the effective radiative forcing of key biogeochemical and aerosol feedbacks in ESM projections; (v) contribute to the development of a new set of combined socio-economic and climate emission scenarios that more explicitly link future socio-economic development pathways with global radiative forcing; (vi) apply the project ESMs to these new scenario data to generate an ensemble of Earth system projections for the coming century and, in combination with the underlying socio-economic scenarios, use these projections to assess joint risks and co-benefits related to climate change, climate impacts, adaptation and mitigation; (vii) ensure data produced by CRESCENDO is available to the international community through timely archival on the ESGF and work closely with climate impact assessment and regional downscaling teams to ensure maximum uptake and use of these data in such complementary areas of science; (viii) actively disseminate knowledge generated in CRESCENDO to fellow scientists, policymakers and the general public.