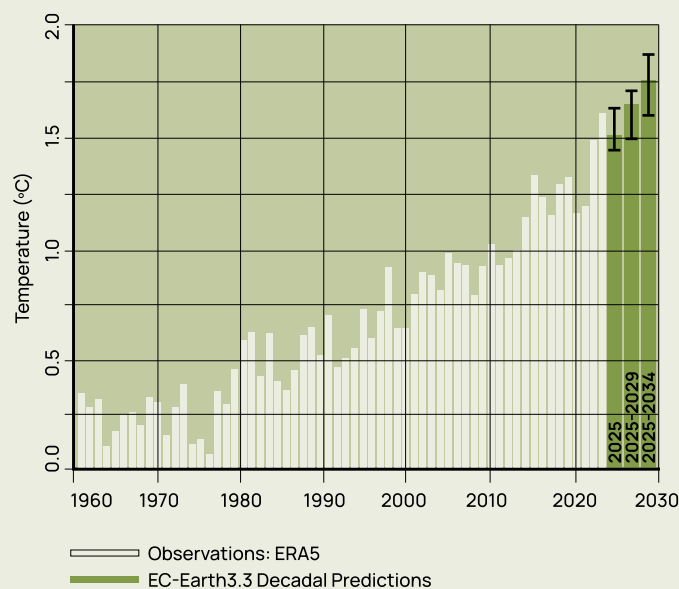


Climate Variability & Change

In the **Climate Variability and Change** group of the Earth Sciences Department at the Barcelona Supercomputing Center-Centro Nacional de Supercomputación (BSC-CNS), we aim to understand and predict how the Earth system evolves and responds to human activities and internal climate variations, by developing global climate prediction capabilities for time scales ranging from a few months to several decades into the future.

Global Mean Surface Air Temperature

Forecast initialised in Nov 2024, Reference Period: Pre-Industrial.



www.decadal.bsc.es



BSC is a public consortium made up of:

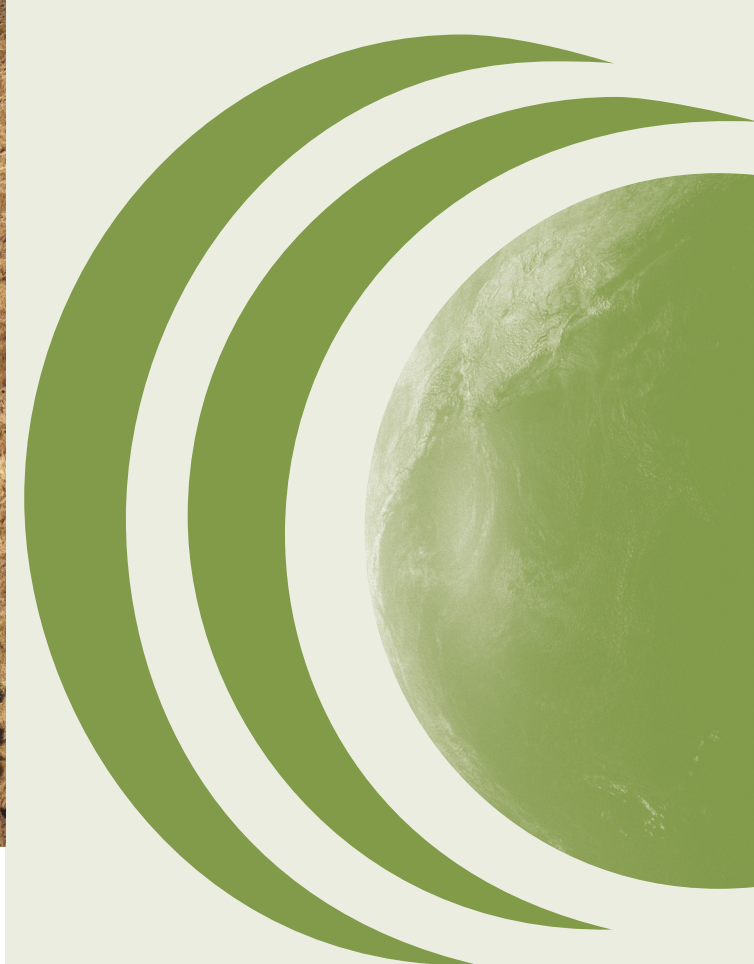


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CLIMATE VARIABILITY & CHANGE

Understanding and modelling the drivers and characteristics of Earth system variability and change



Context



Understanding how the Earth system is evolving due to human activities, such as greenhouse gas emissions, and internal climate variations, as El Niño, and how these different processes influence the carbon cycle and global and regional climate is vital to better predict the future changes to come.

Who we are



We are an interdisciplinary team of ocean, atmospheric, environmental scientists and computer engineers with many years of experience developing and exploiting state-of-the-art Earth system models with cutting-edge observations for climate research.

What we do



We use climate models that solve mathematical equations to simulate the evolution of the atmosphere, ocean, cryosphere and biosphere, and generate climate predictions ranging from months to several decades into the future. Supercomputers, like MareNostrum 5, enable us to run complex climate models, capable of resolving more detailed physical and biogeochemical processes.

Why we do it



We investigate the Earth system and its predictability to enhance the effectiveness of climate adaptation and mitigation strategies. By refining Earth system models and prediction methods, we provide valuable insights to help societies prepare for and respond to future climate challenges.



How we do it



We use Earth system models that allow us to understand and predict climate, including extremes such as heat waves, floods and other phenomena with important socioeconomic impacts. Our more complex models also represent biological and chemical processes, allowing us to assess the effectiveness of climate mitigation measures, and study and predict critical changes in carbon dioxide concentrations and even effects on the biosphere.