

# PROJECT OBJECTIVES

## OVERALL OBJECTIVE

Develop, evaluate and apply a world-leading Earth system modelling infrastructure to contribute to solving the grand challenges faced by the Earth and environmental sciences.

## SCIENTIFIC-TECHNICAL OBJECTIVES

- Improve the representation of key processes in Earth system model compartments
- Establish a coordinated approach towards the coupling of Earth system model compartments, and include new compartments
- Develop and Earth system data assimilation framework to effectively combine models and observations
- Provide effective and open access to Earth system modelling data

## STRATEGIC OBJECTIVES

- Develop an Earth system modelling strategy for the Helmholtz Association (2020–2040) that takes into account cooperation with external stakeholders
- Develop a concrete plan for the implementation of coordinated Earth system modelling activities in PoF-IV

## ESM PROJECT COORDINATION OFFICE

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# CONTRIBUTE TO SOLVING GRAND CHALLENGES THROUGH ADVANCED EARTH SYSTEM MODELLING

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## PROJECT STRUCTURE

### **WORK PACKAGE 1: EARTH SYSTEM MODEL DEVELOPMENT**

to enhance the fidelity of Earth system models by improving the realism of key processes in Earth system model compartments and by establishing a common framework that facilitates the coupling of different Earth system components.

### **WORK PACKAGE 2: EARTH SYSTEM DATA ASSIMILATION**

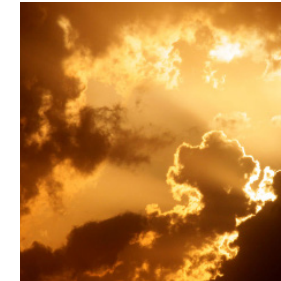
to develop and apply an Earth system data assimilation framework to improve models, provide best estimates of the current state of the Earth system, initialise predictions and design integrated Earth observing systems.

### **WORK PACKAGE 3: FRONTIER SIMULATIONS**

to design, carry out and analyse a set of cutting-edge simulations, using the latest Earth system modelling technology, to provide solutions to grand challenges.

### **WORK PACKAGE 4: STRATEGIC DEVELOPMENT**

to set up a strategic process that will result in a long-term Earth system modelling strategy as well as an implementation plan for Earth system modelling activities in the next round of programme-oriented research (PoF-IV) and to train the next-generation of Earth system modellers.



## **PARTICIPATING PARTNERS**

- Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI)
- German Aerospace Centre (DLR)
- Jülich Research Centre (FZJ)
- GEOMAR, Helmholtz Centre for Ocean Research Kiel (GEOMAR)
- German Research Centre for Geosciences, Helmholtz Centre Potsdam (GFZ)
- Helmholtz Centre Geesthacht, Centre for Materials and Coastal Research (HZG)
- Karlsruhe Institute of Technology (KIT)
- Helmholtz Centre for Environmental Research (UFZ)