WP5 : Changing Regional Patterns and Global Changes

Cross-cutting WP; Focus on three areas: Europe, Tropics, Arctic

Main partners: IPSL (Bony), Univ Reading (Shepherd), MISU (Svenson) + WP leaders

Objectives

The specific objective of this cross-cutting activity is to understand what controls the magnitude of global changes and the regional patterns of climate response to anthropogenic forcings predicted by Earth System Models, and to assess their reliability so as to better inform adaptation and mitigation policies. We will focus on three areas: Europe, the Arctic, and the tropical belt.

Recognizing that many aspects of the regional climate responses are closely tied to large-scale changes, we will develop an interpretative framework that will interpret regional temperature and precipitation responses in terms of changes in the global-mean temperature and in the large-scale atmospheric circulation (Task 1).

Capitalizing on the different WPs (WP2, WP3, WP4), we will compare the Earth System responses to different forcings (*e.g.* greenhouse *vs* aerosols, past vs future), and their dependence on boundary conditions (*e.g.* SST patterns, land surface) and physical processes (e.g. clouds and convection) using the above interpretative framework. We will identify which aspects of the global and regional responses are robust across models, forcings and boundary conditions, and which aspects are not (Task 2).

We will then interpret the robust aspects of the Earth System response to anthropogenic forcings and will assess their reliability (Task 3). Moreover, by breaking down regional uncertainties into different sources, we will propose targeted observational constraints and model adjustments that should help reduce them (Task 4).

WP5 Tasks:

Task 5.1: Development of an analysis framework aiming at relating the regional patterns of temperature and precipitation changes to large-scale drivers.

Task 5.2: Apply this methodology to the analysis of the dependence of the Earth System response to different forcings, boundary conditions and atmospheric processes.

Task 5.3: Interpret robust aspects of the global and regional responses to anthropogenic forcings (past, future)

Task 5.4: Interpret/Attribute global and regional uncertainties.