Climate model results for scientists, governments and the private sector.

More people than ever now have a need to discover the results of climate models in order to prepare for and mitigate against the potentially severe impacts of global climate change. But climate modelling is a complex process, which requires accurate and complete metadata (data describing data) in order to identify, assess and use the climate data stored in digital repositories.

Simulations have a key role in constructing understanding and producing predictions in climate science. But it can be difficult to discriminate between two simulations, even when you were responsible for producing them! Existing documentation currently revolves around (at best) the runtime, but not the scientific detail and relevance of the model components. There is little or no documentation of the “simulation context” (the why’s and wherefores and issues associated with any particular simulation).

Metafor Goals

The Metafor project seeks to address the fragmentation and gaps in availability of metadata as well as duplication of information collection, and problems of identifying, accessing or using climate data that are currently found in existing repositories.

To do this the main objective of Metafor is to develop a Common Information Model (CIM) to describe climate data and the models that produce it in a standard way, and to ensure the wide adoption of the CIM. Metafor will also develop, deploy, and evaluate a prototype infrastructure that will allow key data and models to be discovered and compared between distributed digital repositories.

Metafor will optimize the way climate data infrastructures are used to store knowledge, thereby adding value to primary research data and information, and providing an essential asset for the numerous stakeholders actively engaged in climate change issues (policy, research, impacts, mitigation and private sector).

The Metafor Team

The Metafor team have developed strong international collaborations and working processes over the first two years of the project. The Metafor partners are:

NCAS Climate, NCAS CMS, Reading University, UK
   (Coordinator: Dr Eric Cullyard)

NCAS BADC (STFC CEDA), UK
   (Project Manager: Dr Sarah Callaghan)

CERFACS, France

Models and Data, Max Planck Institute for Meteorology, Germany
   Institute Pierre-Simon Laplace, CNRS, France

University of Manchester, UK

Met Office, UK

Administratia Nationala de Meteorologie, Romania

Meteo France, CNRM, France

CLIMPACT, France

CICS, Princeton University, USA

University of Cantabria, Spain

Development of the CIM

An essential aim of Metafor is that the conceptual model is not changed by the manner in which it is used or applied. Hence multiple application models (AFCIM) can be created using different techniques, but still refer to the same conceptual model (CONCM). The CIM is at the heart of the Metafor project. Development of the CIM has involved all the project partners and significant input from other climate modelling groups in Europe and the US.

Climate modelling is a complex process with a wide degree of variability between different models and different modelling groups. To accommodate this, the CIM has been designed to be highly generic and flexible.

We describe the climate modelling process simply as “an activity undertaken using software on computers to produce data.” This has been described as separate UML packages (and, ultimately, XML schemas).

Further information about the Metafor project can be found at http://metaforclimate.eu

If you have any comments or questions about Metafor, the CIM or the CMIP5 questionnaire we’d love to hear from you!