Geophysical Research Abstracts, Vol. 8, 05249, 2006
SRef-ID: 1607-7962/gra/EGU06-A-05249

Climate model data management - future challenges

W. Strand

National Center for Atmospheric Research, Boulder, CO, USA (strandwg@ucar.edu)

The current generation of climate models, particularly those that submitted data for the IPCC Fourth Assessment Report (IPCC AR4) have been used to generate data in tremendous volumes. For example, the National Center for Atmospheric Research's (NCAR) Community Climate System Model (CCSM version 3.0) was used to generate approximately 150 TB (10ˆ12 bytes) of model output data for the IPCC AR4 and the CCSM was one of only ˜20 models that submitted data for the IPCC AR4.

The needs of the climate change science community for large ensembles of model experiments, at high resolution (spatially and temporally), for multiple model comparisons, with easy, robust, and secure access to data create significant challenges. Issues involving metadata, security, provenance, among others, are being addressed at the national and international levels, and several efforts are underway to address these issues.

In the future (over the next 3-5 years), these challenges will increase, as climate models become more complex, the volume of data generated grows, and the demands of the scientific community expand. It's not unreasonable to assume that for the IPCC AR5 (Fifth Assessment Report, sometime after 2010), hundreds of terabytes to perhaps tens of petabytes (1,000 TB) of climate model data will be available for analysis.

Given these challenges, potential solutions to the problems raised by the needs of the climate change science community meeting the realities of hardware, software, networks and security are discussed.