



Building a workflow management environment for earth system sciences: preliminary results

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With the rapid evolution of high performance computing, storage and observation networks over the last few decades, scientific tasks related to analyzing and modeling earth systems became increasingly complex. Many efforts are currently underway to facilitate and to streamline computational tasks as well as to deal with multidisciplinary and distributed nature of the problems.

This study aimed at creating a workflow-based workbench for earth system scientists. The proposed environment is based on KEPLER open source scientific workflow system, which in turn uses PTOLEMY II system for heterogeneous, concurrent modeling and design. It also provides a mature platform for building and executing workflows, and supports multiple models of computation.

To enable modeling earth system related applications, some base actors have been added to KEPLER system for tasks such as creating NetCDF files, reading structured binary format of the Fifth-Generation NCAR/Penn State Mesoscale Model (MM5) and grid generation tools for Princeton Ocean Model (POM). New data formats have been designed to transfer data and metadata between various actors. The structure of these earth custom data classes are of crucial importance for any earth system modeling framework.