Cpl6 and the Model Coupling Toolkit: coupling software for the Community Climate System Model

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The Community Climate System Model (CCSM) uses a class library for all inter-model coupling: cpl6, a small library built on another class library called the Model Coupling Toolkit (MCT). Cpl6 offers a standard interface for communicating with the CCSM hub coupler. Coupling is achieved by placing calls to the cpl6 library within the component models and requires little modification of the individual model's source code. MCT/cpl6 provides parallel data transfer between the parallel coupler and the individual parallel physical models. Functions that reside in CCSM's hub coupler, such as interpolation, diagnostics, merging, time averaging and input/output are also implemented with cpl6/MCT datatypes and methods and all methods are fully parallel. Using cpl6/MCT, CCSM users have been able to substitute new models in for existing models and easily add new fields to the coupled model data flow.