

Workshop Announcement: Modularity and Integration of Climate Models

At the 2nd Annual Conference on Computational Sustainability
<http://www.computational-sustainability.org/compsust10/index.php>

Date: June 28-30, 2010 (precise date TBD)

Location: Massachusetts Institute of Technology in Cambridge, MA, USA

Description: Traditionally, computational models designed to simulate climate change and its associated impacts (climate science models, integrated assessment models, and climate economics models) have been developed as standalone entities. This limits possibilities for collaboration between independent researchers focused on sub-problems, and is a barrier to more rapid advances in climate modeling science because work is not distributed effectively across the community. The architecture of these models also precludes running a model with modular sub-components located on different physical hardware across a network.

In this workshop, we hope to examine the possibility for widespread development of climate model components that may be developed independently and coupled together at runtime in a “plug and play” fashion. Work on climate models and modeling frameworks that are more modular has begun, (e.g. Kim, et al., 2006) and substantial progress has been made in creating open data standards for climate science models (<http://cmip-pcmdi.llnl.gov/>), but many challenges remain. Topics we seek to consider at the workshop include, but are not limited to:

- Development of standards for documenting model assumptions, and computational techniques to determine the compatibility of those assumptions.
- The development of open data standards for the exchange of information between integrated assessment models / climate economics models.
- Open modeling languages and engines.
- Response surface methodologies.
- Feasibility of cleaving existing models.
- Feasibility of distributing model execution – e.g. with model sub-components distributed across the network.
- Runtime complexity of such distributed models.
- Managing cyclical interactions in such distributed models.

A goal of this workshop is to characterize issues like these more precisely, and to brainstorm about approaches to addressing them. Another desirable outcome of this workshop is the creation of an informal working group that is interested in promoting more modular climate model development.

Format: The workshop will last roughly 1 hour and 50 minutes, and will be organized as a series of six talks, followed by 20 minutes of open discussion. Each talk will last ten minutes, and will be followed by five minutes of questions. Interested participants are invited to submit two page abstracts per conference guidelines to jintrone@mit.edu. Abstracts will be selected to maximize the diversity of topics considered at the workshop.

Abstracts received by **Thursday, June 24** will be considered for inclusion in the workshop agenda.

References:

Kim, S., Edmonds, J., Lurz, J., Smith, S., Wise, M. (2006) "The objECTS Framework for integrated Assessment: Hybrid Modeling of Transportation." *Energy J* 2(2006):51–80 (Special Issue).