Report back from presentation of iESM to the Integrated Assessment Modeling Consortium (IAMC)

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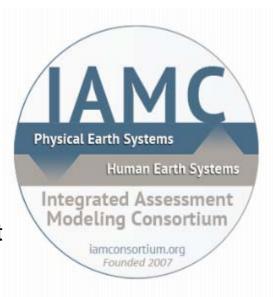
CESM Societal Dimensions Working Group Meeting
February 19, 2013 Boulder, CO

Integrated Assessment Modeling Consortium

- ▶ IAMC is a scientific research organization that
  - ■ Facilitates development of and research with IAMs
  - ■ Coordinates interactions between IAMC members and other scientific communities (including climate modeling)
  - ■ Provides a point of contact with organizations that use the science results of the IAM community, such as the IPCC
- ▶ Created in 2007 in response to the IPCC call for a research organization to lead development of new scenarios
- ▶ Hosts an annual meeting and forms scientific working groups around key community issues.

IAMC 5th Annual Meeting – November 2012

Pacific Northwest
NATIONAL LABORATORY

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▶ Largest annual meeting to date with 60 participants

▶ Day 1

- Opening Plenary Session
- Parallel Session: Climate Modeling in Integrated Assessment
- Parallel Session: Energy-Water-Land Interactions

▶ Day 2

- Parallel Session: Impacts and Adaptation in IA Research
- Parallel Session: Evaluation, Diagnostics and Uncertainty in IA Modeling
- **iESM Lunch Breakout**
- Closing Plenary Session

Today's Goal: Feedback on iESM

- iESM: an independent project, but proposes to become part of the CESM code base

- Role of WG: to provide its view to CESM Steering Committee on whether this project would serve the broader community

- We seek your input, which will be discussed at February WG meeting
  - Is the general approach to model linkage a useful starting point for other groups to use, or to build on?
  - Is the code for linking models useful to other groups?
  - Are there any suggestions about how the WG could best serve community interests in the area of IAM-CESM interactions?

- Please provide feedback on iESM and CESM use with IAMs in General (email and at meeting)

- Please join us for SDWG NCAR 19-20 Feb 2013.

http://www.cesm.ucar.edu/working_groups/Societal

- 25+ people attended, including representatives from all the RCP modeling groups
- 2 short presentations
  - Peter Lawrence on the CESM, its community structure and the role of the SDWG
  - Bill Collins on the iESM modeling capability
- Discussion
  - Clarifying questions
  - Questions on computational resource requirement and uncertainty
    - Answer: Similar to the CESM, adding the IAM does not add noticeably to the run time
  - What about IAM groups without access to computers of a class that can run CESM?
    - Answer: Joining the SDWG can help with getting access to resources and CESM is modular so could be adapted to make runs on smaller machines feasible.

Flexibility of iESM to work with other IAMs

▶ iESM framework works with regional land cover data, therefore it can in theory work with any IAM that produces such information

- The feedback of climate impacts on the IAM requires some development within the IAM itself;
  - This capability will be part of the GCAM community model, therefore the coding to do so will be freely available to others
- Example of the MIT IAM (EPPA-IGSM) which includes both a climate and IA model component
  - May require software engineering effort
- Forward-looking IAMs would require the CESM component to run to the end of the period (e.g. 2100) at every IAM time step.
  - One possible modification is a climate model emulator to reduce or eliminate need to iterate with full CESM like this.

Other technical questions

► How can you attribute results to decisions made in GCAM vs. feedbacks from CESM?

  ■ Comparison of coupled runs with offline runs

► Will feedbacks other than land use be represented?

  ■ In the longer term development plan, yes.

► Does this framework expose BGC feedbacks that are appreciably different from those generated with a simple climate model

  ■ We have not tested this in GCAM, but we can replace CESM with a simple model in the iESM framework to do so.