Reports back from Breakout Groups

IAMC
Physical Earth Systems
Human Earth Systems
Integrated Assessment Modeling Consortium
iamconsortium.org
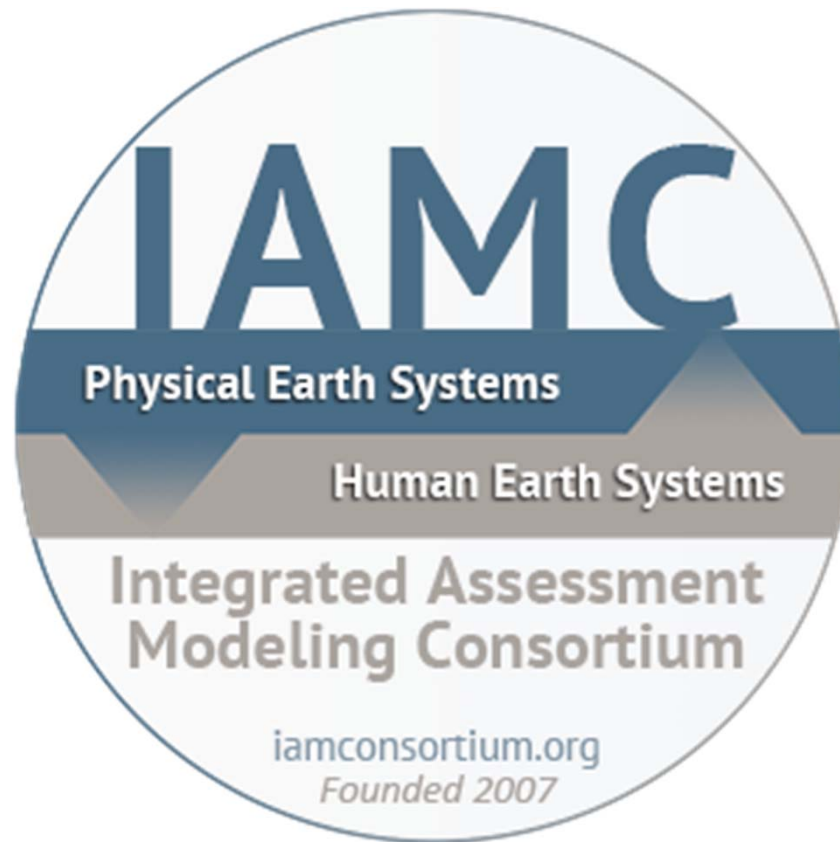Founded 2007

November 14, 2012

Climate Modeling in Integrated Assessment

Parallel Session: Climate Modeling in Integrated Assessment			
13:40	13:45	Introduction	Detlef Van Vuuren, Brian O'Neill, Jae Edmonds
13:45	14:15	The benefits of climate change mitigation in integrated assessment models: The role of the carbon cycle and climate component	Andries Hof et al
14:15	14:45	Estimating carbon budgets for model comparison and policy-making	Detlef van Vuuren
14:45	15:15	Results of carbon cycle CMIP5 / results climate outcomes CMIP5	Pierre Friedlingstein
15:15	15:45	**Break**	
15:45	16:30	Influence Greenhouse Gas Accounting Methods	Daniel Johansson / Keywan Riahi / Maarten van den Berg
16:30	16:55	The integrated Earth System Model (iESM) project	Bill Collins/Jae Edmonds
16:55	17:10	coupling of IMAGE with EC-Earth	Wilco Hazeleger
17:10	17:45	Open Discussion: Research Priorities	Chairs

Some Possible Research Priorities

Better links to biogeophysical Earth system science

- **Carbon cycle**—especially terrestrial carbon cycle
  - This is a jointly owned space—carbon cycle, climate modeling, IAMs
  - Everyone needs to be better and we need to be better together

- **Climate modeling**
  - Representation of state-of-the-art CMs
  - Full integration with CMs

- **Greenhouse gas accounting**
  - Links between science and policy

Energy-Water-Land Interactions

Parallel Session: Energy-Water-Land Interactions			
13:40	13:50	Introduction	Leon Clarke, Tom Kram, Steven Rose
13:50	14:20	Water modeling in the MIT iGSM framework	Adan Schlosser et al.
14:20	14:50	Modeling water, land, and energy interactions in GCAM - a water focus	Mohamad Hejazi et al.
14:50	15:15	Consistent Analysis of Different Scenarios of Climate Stabilization and Sustainable Development	Keigo Akimoto et al.
15:15	**15:45**	**Break**	
15:45	16:10	A modeling framework for assessing Climate, Land Use, Energy and Water (CLEWs) Interactions	Mark Howells et al.
16:10	16:35	Application of AIM (Asia-Pacific Integrated Model) toward new socio-economic scenario development integrating climate change mitigation, impact and adaptation	Toshihiko Masui et al.
16:35	17:00	Assessing long-term climate change stabilization using an integrated model of energy, economy, land-use and climate	Nico Bauer et al.
17:00	17:15	AIM model approach towards Low Carbon Societies in Asia	Mikiko Kainuma et al.
17:15	17:45	Open Discussion: Research Priorities	Chairs

Discussion Outcomes: Priorities

- **Model intercomparison** (but not right now!)
  - For land use, the models are ready for this sort of activity.
  - The small set of groups that are doing global water scarcity could work together on a simple comparison. The modelers seem to facing the same issues.
  - There may be some value in comparison between regional and global models to understand the implications of scale in modeling.
- **Data**
  - Even if we have to manipulate data individually for our models, there may be value in documenting and sharing information about different sources. Is there a role of the IAMC in this.
  - There are a lot of places where we need better data. For example, the data on water demands is awful. Could we find ways to give other communities an incentive to produce this data?
- **Improving the models**
  - Spatial resolution, temporal resolution, associated extremes, realism of institutional structures.

Evaluation, Diagnostics, and Uncertainty in Integrated Assessment Modeling

Parallel Session: Evaluation, Diagnostics, and Uncertainty in Integrated Assessment Modeling			
8:30	8:40	Introduction	Elmar Kriegler, Massimo Tavoni, John Weyant
8:40	9:05	Latest advancements in Uncertainty analysis in IAMs	Mort Webster
9:05	9:30	Sobol method applied to DICE	Pat Reed
9:30	9:55	Technology uncertainty and optimal R&D portfolios (Overview of the TEaM Project)	Massimo Tavoni
9:55	10:20	Probabilistic cost estimates for climate change mitigation	Joeri Rogelj et al.
10:20	10:45	The Min-max Regret and the Max Expected Utility Strategies for the Climate Policy Evaluations under Uncertainties by the expansion of Integrated Assessment Model MARIA	Shunsuki Mori
10:45	**11:15**	**Break**	
11:15	11:40	Evaluating integrated assessment models with stylized facts - an exercise with ReMIND	Jana Schwanitz et al.
11:40	12:05	A hindcasting experiment in GCAM	Leon Clarke/Jae Edmonds
12:05	12:25	A conceptual approach to the evaluation and diagnosis of integrated assessment models	Rich Rosen
12:25	13:00	Open Discussion: Research Priorities	Chairs

EVALUATION, UNCERTAINTY and DIAGNOSTICS:
issues to the community

1. More and better **documentation** of IAMs and **transparency:** wiki style/website?

2. **Publication** of model methodology and updates: Climatic Change/ new journal (online? peer reviewed?)

3. **List of stylized facts** which can be tested for IAMs can be developed, including setting a **standard for evaluation**. Learn from the climate community?

4. **Data need** for model validation are huge: DB repository?

5. **Scientific working group**: A scientific working group for both **evaluation and uncertainty** which can coordinate diagnostics and probabilistic analysis in IAMs exercises?

Impacts and Adaptation in IA Research

Parallel Session: Impacts and Adaptation in IA Research			
8:30	8:40	Introduction	Juan-Carlos Ciscar, Toshihiko Masui, Keywan Riahi
8:40	9:05	Consequences of shifting pathway from RCP8.5 to RCP4.5	Asbjørn Aaheim et al.
9:05	9:30	Economic consequences of climate change	Santosh Joshiy et al.
9:30	9:50	Economic effects of climate change in the agricultural sector – towards a closed loop assessment	Franziska Piontek et al.
9:50	10:15	Impacts analysis in GCAM	Kate Calvin
10:15	10:45	Multi-model comparison projects: ISIMIP, AgMIP	Dominique van der Menschbrugge / Franziska Piontek
10:45	**11:15**	**Break**	
11:15	11:40	Multiple impacts of global air pollution: Tools, Methods and Applications	Dentener et al.
11:40	12:05	Modelling the climate impacts in Europe (the JRC PESETA II project)	Juan-Carlos Ciscar
12:05	12:30	The Benefits of Mitigation Policies for the United States: EPA's Climate Change Impacts and Risk Analysis (CIRA) Project	Jim McFarland
12:30	13:00	Open Discussion: Research Priorities	Chairs

Priority areas from Impact Session

- **Data collection activities:**
  - Collaboration with impact groups to better understand and improve the range of aggregated impact functions that are used by the IAMs (big uncertainties, from diverse range of studies)
  - Improve utilization of spatial climate and other data for use in IAM/IAV analysis (eg probabilistic interpretation to cover uncertainty).
- **Methodological improvements needed to better take into account non-linearities and tipping points (going beyond gradual change)**
- **Which direction to go with multi-model global assessments?**
  - ISI-MIP a good start, but need to go more into direction of economic analysis
  - SSP-based modeling comparisons to better understand the impact of different development pathways for impacts and adaptation
- **Climate impacts occur in the context of multiple objectives (competing for policy attention). Establish model comparisons to better integrate climate/non-climate impacts and interactions (co-benefits and risks including economic evaluation).**
- **Most models do not include adaptation – promising area of future research (economic evaluation, deterministic vs stochastic, how explicit can we make this, Better understand gross vs net effect and regional effects).**