

Reflections on the RCP Process (a.k.a. “Parallel Process”)

WGCM/AIMES
3 October 2013
Victoria, B.C.

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October 3, 2013

PNNL-SA-94390

The author is grateful to the U.S. Department of Energy's
Integrated Assessment Research Program and NASA's
Earth System Science Program for research support.



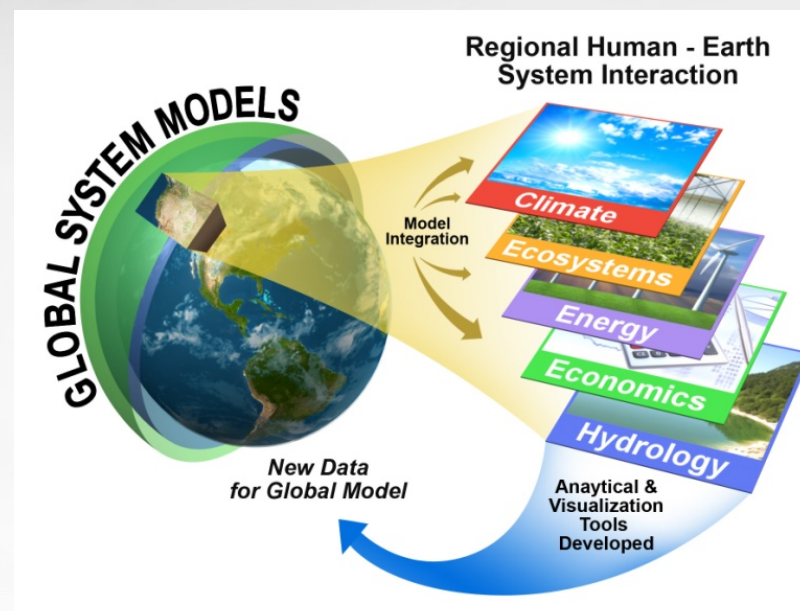
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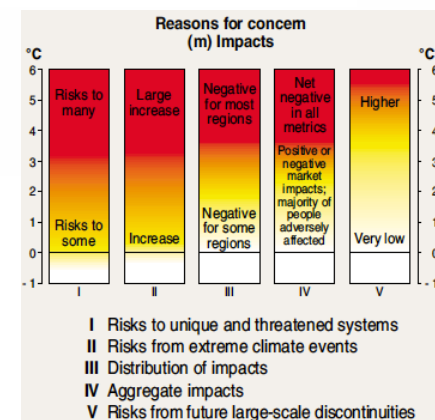
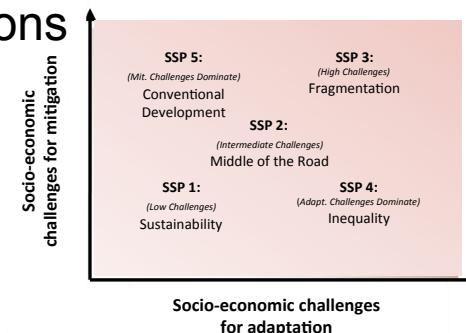
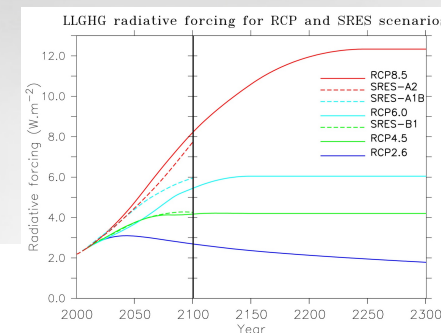
Stages of acceptance of state of regional climate modeling (after Elisabeth Kübler-Ross)

- ▶ Denial – its good, really
- ▶ Anger – so do regional forcings matter or not?
- ▶ Bargaining – I'll do anything for significant regional results
- ▶ Depression – why bother?
- ▶ Acceptance – coming to terms by improving uncertainty characterization



Uses of global change scenarios

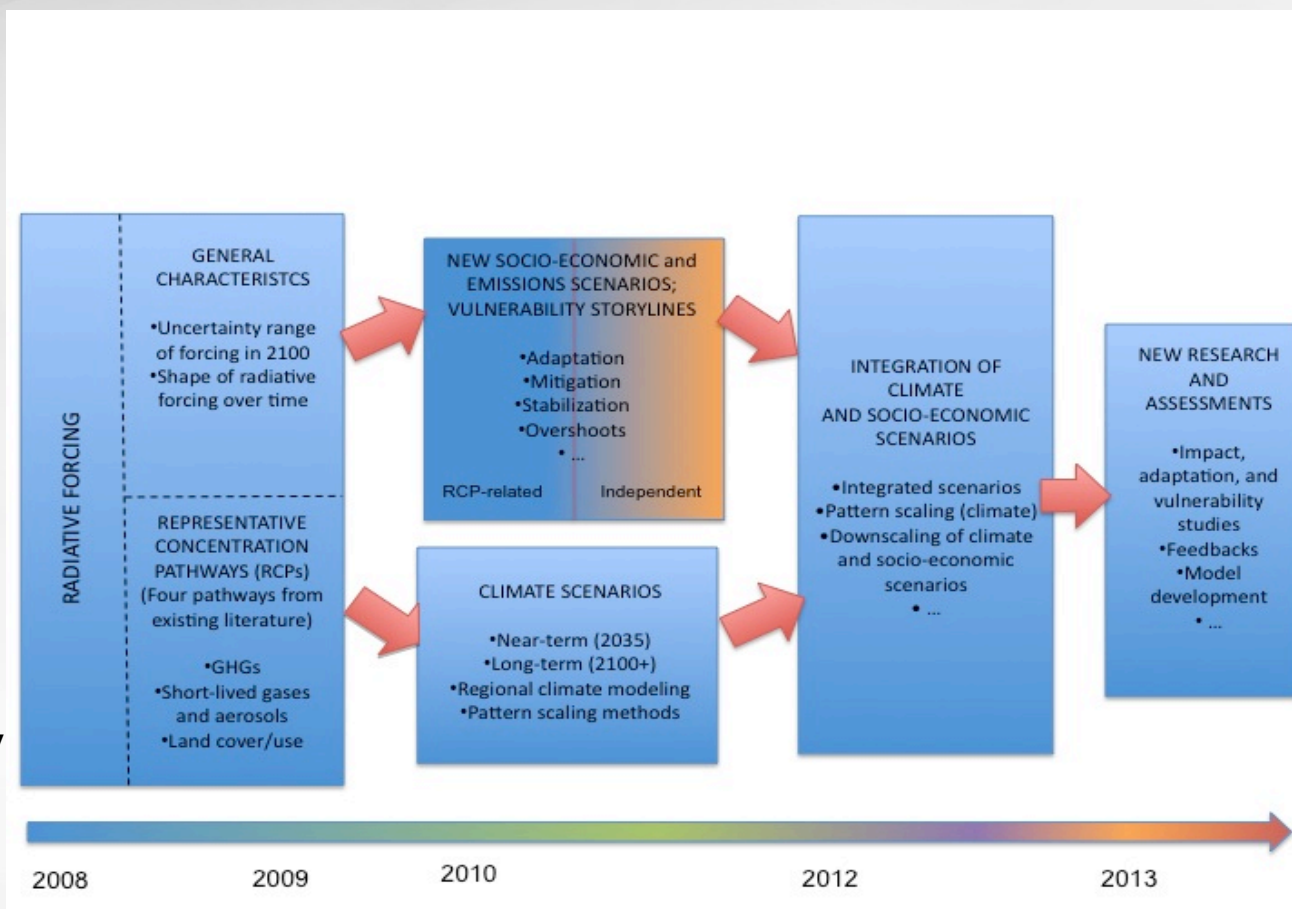
- ▶ **Modeling**
 - Provide exogenous inputs to models
 - Types: Socioeconomic, emissions, climate, first-order impacts (SLR, hydrology, ...)
 - Projections (based on assumptions) not predictions
- ▶ **Assessment reports**
 - Organizing and framing devices
 - Vast set of users, often unspecified
- ▶ **Decision framing and “visioning”**
 - Decision framing and feasibility testing
 - Normative
 - Can be backward looking: start with desired outcome and explore pathways to achieve it





Parallel process

- ▶ Inputs to Earth system modeling
 - Standardized forcing over time
 - Avoid re-running ESMs for “trivial” changes in socioeconomics
- ▶ Broaden approach to socioeconomic scenarios
 - Increase time for development
 - More focus on IAV modeling applications
 - Explore futures to achieve pathways



RCPs: four levels of radiative forcing

FORCING AGENTS

GHG Emissions and Concentrations from IAMs

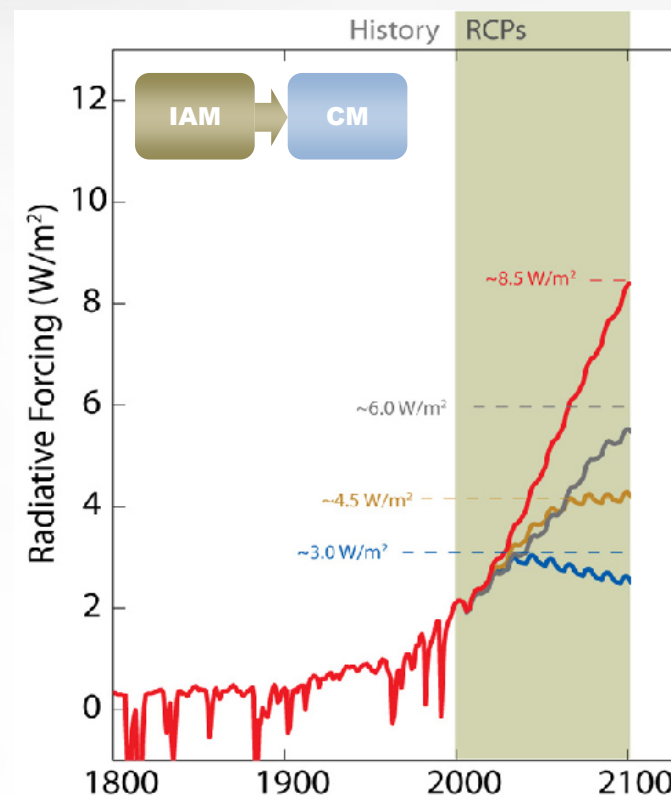
- Greenhouse gases: CO₂, CH₄, N₂O, CFCs, HFC's, PFC's, SF₆
- Emissions of chemically active gases: CO, NO_x, NH₄, VOCs
- Derived GHG's: tropospheric O₃
- Emissions of aerosols: SO₂, BC, OC
- Land use and land cover

EXTENSIONS

- Extension of scenarios to 2300—ECPs

WHAT YOU WON'T FIND

- An integrated, harmonized set of detailed socioeconomic storylines and quantifications



Data at <http://www.iiasa.ac.at/web-apps/tnt/RcpDb/>

Documentation: Climatic Change 109:1-2 (2011) DOI: 10.1007/s10584-011-0148-z

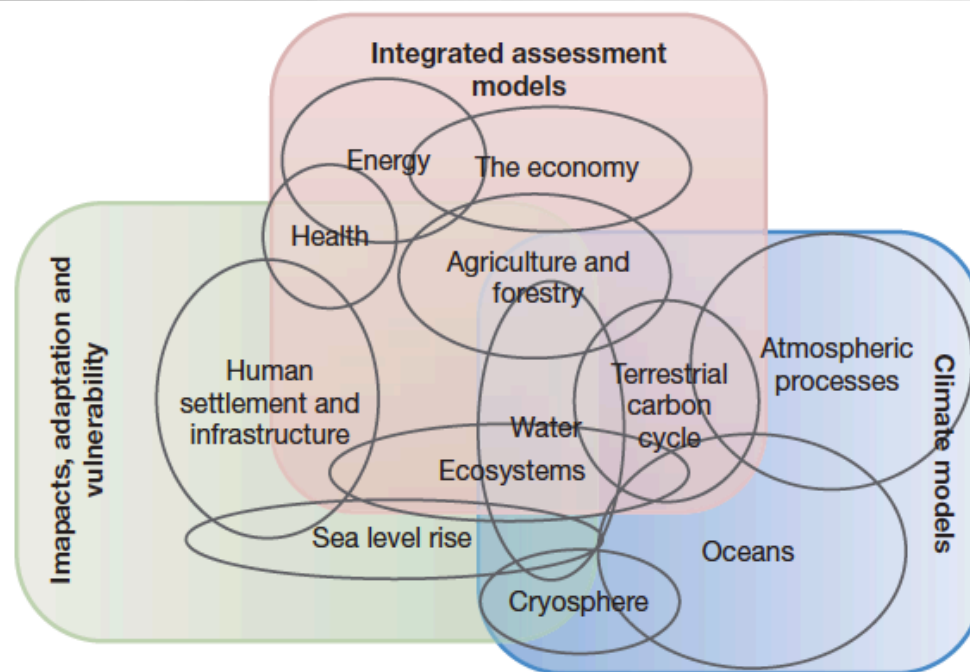
Source: Jae Edmonds



RCPs: What Have We Learned?

- ▶ Results to date: RCPs delivered and used in CMIP5 and impacts model intercomparisons (ISI-MIP; AgMIP)
- ▶ Evaluation and next steps
 - Continue to improve the “handshake process”
 - Consider whether we have the “right” RCPs
 - Improve interval ranges of emissions of chemically-active gases
 - Explicitly incorporate land use in radiative forcing
 - Improve parallel development of scenarios
 - What defines consistency between climate and socioeconomic futures?
 - Extensions (regional and sectoral)
 - Plan “integration phase” for climate, socioeconomic, and first-order impact scenarios
 - Pattern scaling uses and limits
 - Improve treatment and communication of uncertainty
 - Subjective probabilities of pathways (not of narratives)?

Increasing model overlaps – potential benefits of closer collaboration



- ▶ Inter-compare approaches (e.g., land use/cover, carbon, water, ...)
- ▶ Improve surrogate modeling for decision analysis
- ▶ Address key policy-relevant science questions related to
 - SLCFs
 - LU/LCC
 - Overshoot scenarios
 - “Costs and benefits” of different stabilization levels