

Looking back:

Increasing interdisciplinarity and integration; unprecedented interdisciplinary collaboration and treating the earth as a system connecting human activity with changes to the physical world; AGCI has enabled these connections

Establishment of scientific network (WCRP etc, with some drawbacks due to political nature) and assessment network (IPCC and NCA)

New fields of science: climate change detection/attribution, climate models have run plausible scenarios of the future with connections from IAMs; decadal climate prediction (“seamless”)

**Rise of earth system models vs just climate models;
IAM development major accomplishment including aspects of human behavior**

But...

Lack of integration of the cultural domain, worldviews, values, motivations

**Communication to society and policymakers has lagged
(e.g. IPCC vs. NCA)**

**Tension in community: community-use scenarios vs simulations
for increasing knowledge;
Applied political needs-driven research vs fundamental research**

Frontiers for the future:

Cities and global change, integrating concept involving physical, human, social

Next generation of scientists, role of women, greater emphasis on technology

Include other ways of knowing, arts, humanities, spiritual perceptions other worldviews

Evolve from climate change to global change with many disciplines and including human interactions

Interrelatedness of mitigation and adaptation: a more inspiring future vision with this connection

Decadal climate prediction, seasonal to decadal, limits to predictability, connects near-term science information to user needs

Frontiers (cont.)

Citizen science, knowledge management (need standards and metrics)

Need for increasingly complex and realistic ESMs incorporating all possible knowledge of physical world, but also need hierarchy of models to address specific science and societal needs

Global change information for risk mitigation options and decision support

Reward communication and interdisciplinary research without threat to tenure; “bridge builders”, facilitating interdisciplinary work, multi-disciplinary skill set; evolve from climate science and services to global change science and services

Proposal for a new field of science: “Whole earth system assessment science” encompassing and integrating many disciplines from physical and social sciences and human interactions

Ongoing integrating role of AGCI

Landmark AGCI sessions (a few examples—need more from past chairs)

1992: for the first time formulated a vision for earth system modeling for the next 20 years

1998: charted an interdisciplinary research agenda to study changes in weather and climate extremes for the first time

2005: first ever interdisciplinary session on US weather and climate extremes, prospectus and author team formed for CCSP extremes report; 2007 session finalized the report

2006: interdisciplinary session to formulate the experiment design for CMIP5; first time that climate modelers, chemistry and aerosol modelers, land surface modelers, biogeochemistry modelers, IAM modelers, IAV researchers met to come up with a large coordinated model intercomparison

2008 AGCI session formulated the first-ever coordinated set of decadal climate prediction experiments for the CMIP5 experimental design; the start of the new field of decadal climate prediction

2013: session to plan CMIP6 bringing together climate scientists, IAM modelers and IAV researchers

Landmark AGCI sessions (cont.)

2009: AGCI session brought together *water utility managers and climate modelers* to discuss user needs versus what climate models could provide

2010: AGCI session brought together *solar physicists and climate modelers* for the first time to discuss the possible influences of solar variability on earth's climate

2012, physical and social scientists were brought together to define, for the first time, the meaning of “adaptation science”, a major component of the new USGCRP Strategic Plan

2014: Following up on the 2013 CMIP6 planning session, several key CMIP6 MIPs needed to coordinate experiment designs across disciplines for CMIP6 (ScenarioMIP, LUMIP, AerChemMip)

Landmark AGCI sessions (cont.)