

Research gaps in adaptation

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**CIRCLE-2 First Annual Progress Meeting
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IPCC

- Established in 1988 by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO)
- Purpose is to assess scientific, technical, and socioeconomic information relevant for understanding human-induced climate change, its potential impacts, and options for mitigation and adaptation

Working Group II

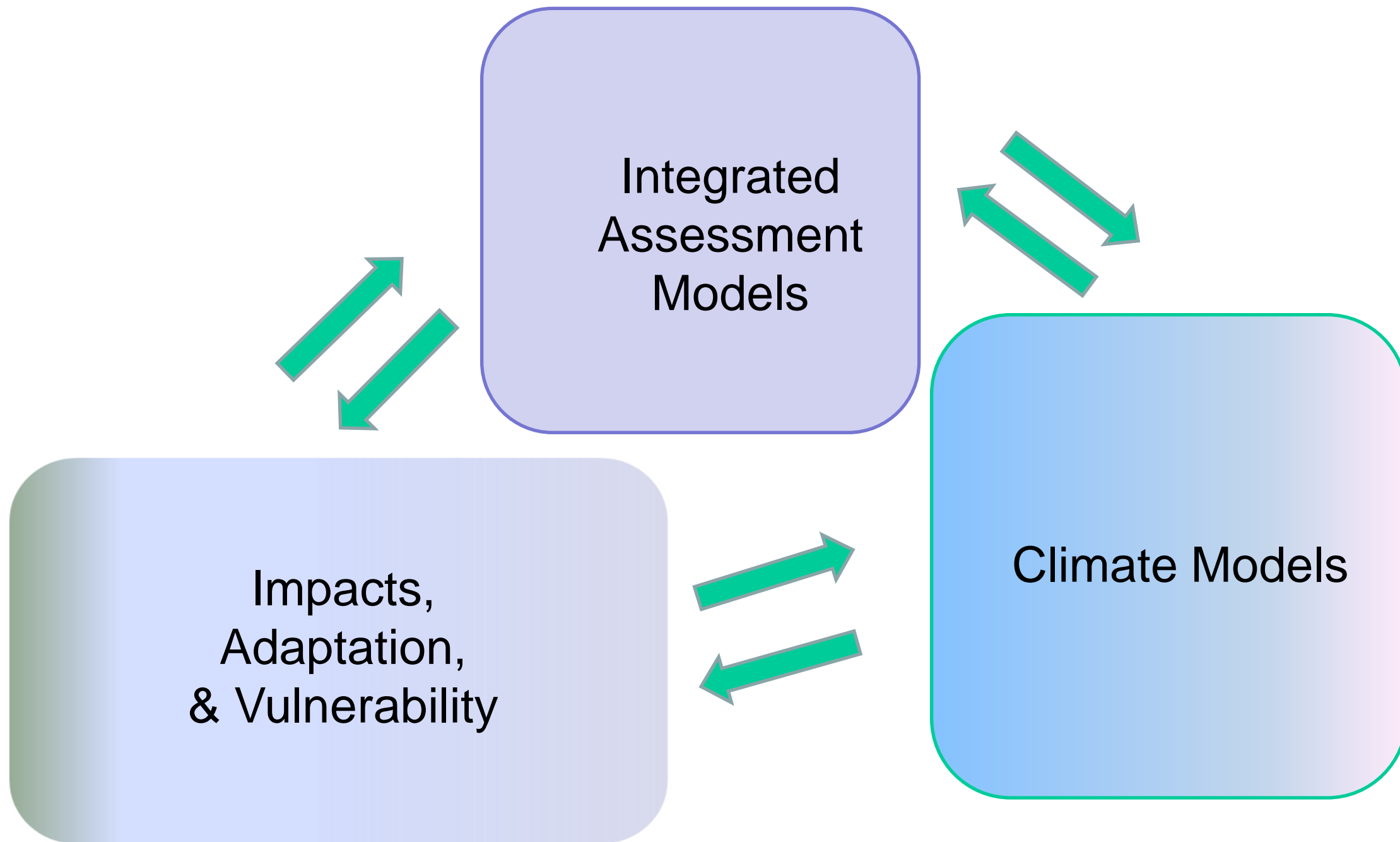
- Assesses the scientific, technical, environmental, economic, and social aspects of the vulnerability (sensitivity and adaptability) to climate change of, and the negative and positive consequences for, ecological systems, socio-economic sectors and human health, with an emphasis on regional sectoral and cross-sectoral issues

Stakeholder needs

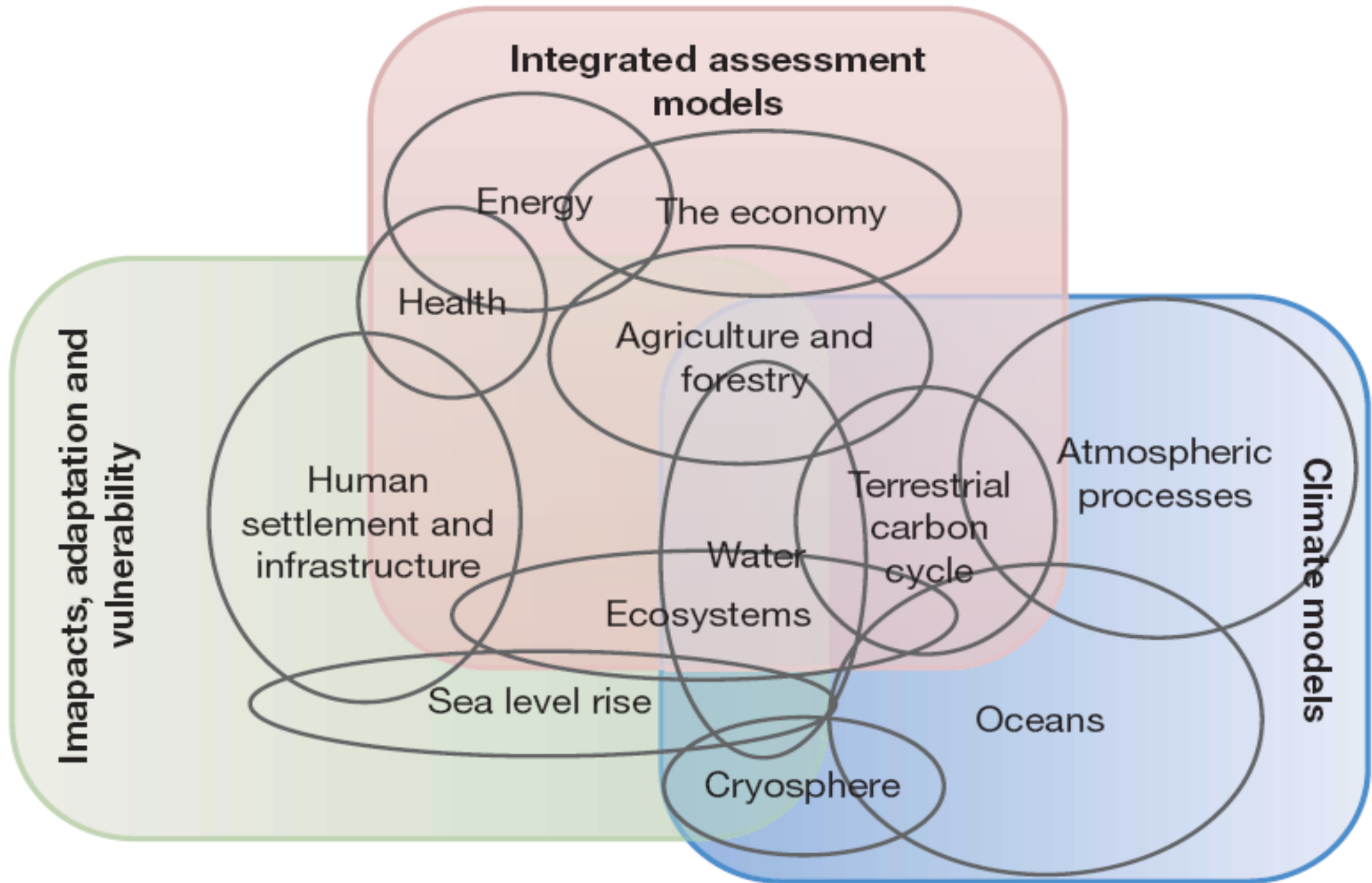
- High-confidence
 - Integrity
 - Basic mechanisms
 - Multiple lines of evidence
- Support for decisions under uncertainty
 - Concept of a pdf
 - Risk = probability x consequence
 - Nature of consensus

Chris Field

Old view: An interconnected system



Integrated system approach



Major themes -- WGII

- Integration of climate science & climate impacts
- Broad range of assessed impacts
- Climate change in the context of other stresses
- Framing to support good decisions, including information on risk
- Full partnership for adaptation
- Integration of adaptation, mitigation, & development
- Comprehensive treatment of regional aspects of climate change (including info from WGI & WGIII)

PART A: GLOBAL & SECTORAL ASPECTS

Context for the AR5

- 1 Point of departure
- 2 Foundations for decision-making

Natural and Managed Resources and Systems, and Their Uses

- 3 Freshwater resources
- 4 Terrestrial and inland water systems
- 5 Coastal systems and low-lying areas
- 6 Ocean systems
- 7 Food production systems and food security

Human Settlements, Industry, and Infrastructure

- 8 Urban Areas
- 9 Rural Areas
- 10 Key economic sectors and services

Human Health, Well-Being, and Security

- 11 Human health
- 12 Human security
- 13 Livelihoods and poverty

Adaptation

- 14 Adaptation needs and options
- 15 Adaptation planning and implementation
- 16 Adaptation opportunities, constraints, and limits
- 17 Economics of adaptation

Multi-Sector Impacts, Risks, Vulnerabilities, and Opportunities

- 18 Detection and attribution of observed impacts
- 19 Emergent risks and key vulnerabilities
- 20 Climate-resilient pathways: adaptation, mitigation, and sustainable development

Part B: REGIONAL ASPECTS

with WG1 and WG3 input and collaboration

21. Regional Context

- Introduction
- Information on observed climate changes and relevant non-climate factors
- Regional projections: added value and limitations
- Similarities and pertinent differences in systems across regions
- Cross-regional hotspots

Regional Chapters

22. Africa

23. Europe

24. Asia

25. Australasia

26. North America

27. Central and South America

28. Polar Regions

29. Small Islands

30. Open Oceans

An interdisciplinary research agenda for climate change adaptation

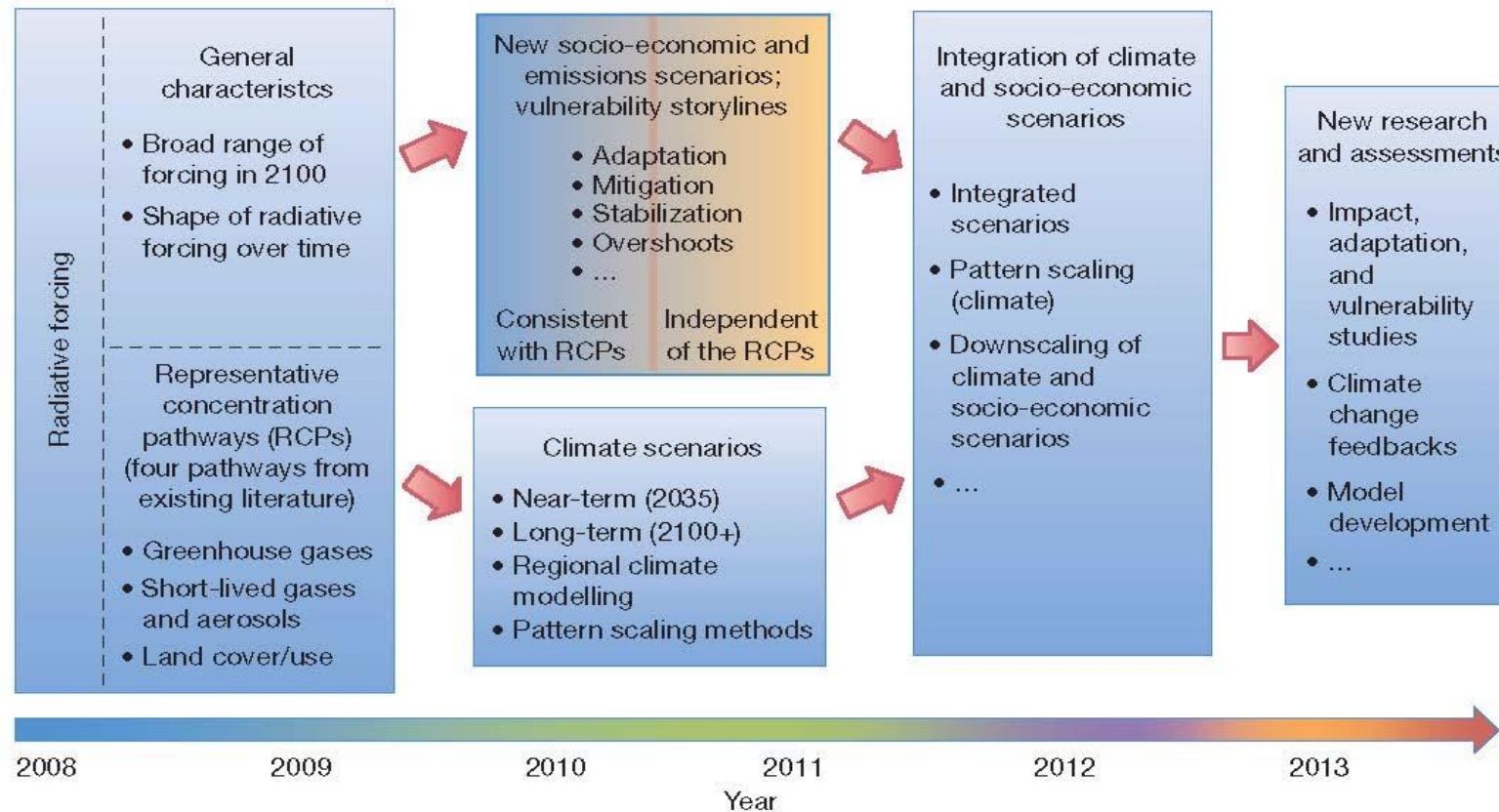
“Decision makers will need new kinds of information and new ways of thinking and learning to function effectively in a changing climate.” [NRC, 2009]

- **Sensitivity to climate**
- **Understanding adaptation contexts and capacities**
- **Knowledge for climate adaptation**
- **Living with uncertainty**

An interdisciplinary research agenda for climate change adaptation

- **Understanding risk and uncertainty**
- **Decision support tools**
- **Evidence, power and politics in adaptation to climate change**
- **Governance of adaptation**
- **Other (evaluation, financing, equity and justice)**

New scenario framework (Moss et al., 2010)



Undertaken by “the community”, not the IPCC

Define a series of **socio-economic scenarios** which can be used with the RCPs or other climate scenarios to estimate consequences for impacts, adaptation and mitigation

- *To facilitate integrated analysis and assessment of mitigation, adaptation and residual climate impacts, at the regional and global scales;*
- *To facilitate the comparison of results from different research projects;*
- *To provide a context for local-scale analyses by providing regional and global boundary conditions*
- *To facilitate integration of research across all three IPCC Working Groups*

AEA report to LWEC on adaptation

Priority Research Needs: As identified by LWEC partner organisations and adaptation experts

How do people at the individual, organisational, or sectoral level interpret and act on the uncertainty of climate change risks (both long-term climate change, and extreme events).

Socio-economic scenarios and guidance on other ways of thinking about the future, such as decision pathways.

Community-led adaptation techniques in practice in the developed world, especially on contentious issues (e.g. managed coastal retreat).

Cumulative effects of multiple climate change impacts (e.g. impacts from heatwaves followed immediately by impacts from extreme rainfall). The cumulative impacts could be more devastating than the sum of individual one-off events.

How different levels of governance and the distribution of power (both decision-making power and financial power) affect the development of adaptation responses.

Improved understanding of the impact of climate change on UK policy across sectors and scales, and conversely, the impact of policy on vulnerability to climate change.

Improved understanding of the value of ecosystem services.

Improved understanding of the links between biodiversity and spatial-planning.

Improve decision-making and planning of water resources by integrating drought, flood, water quality and land-use models.

Define what constitutes successful adaptation and what constitutes mal-adaptation at different sectors and scales.

How to adapt critical infrastructure to a changing climate, and how to prepare for slow onset changes.

Supporting the process of spatial planning decision making in the context of a changing climate.

The role of the individual, community, and organisational values in adaptation.

How to build adaptive capacity and move from building capacity to action.

Primary research on economic costs and economic valuation to develop a better body of evidence for informed decision-making.

There is still time to get this research into IPCC!

- WGII AR5 literature cut-off date for “submitted” papers: **31 January 2013**
- WGII AR5 literature cut-off date for “accepted” papers: **31 August 2013**
- WGII AR5 publication: March 2014

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