

THE IPCC's FIFTH ASSESSMENT REPORT (AR5)

ipcc
INTERGOVERNMENTAL PANEL ON
climate change



The IPCC's Fifth Assessment Report (AR5)

Completion dates

Working Group I
23 - 27 September 2013

Working Group II
25 - 30 March 2014

Working Group III
7 - 12 April 2014

Synthesis Report
27 - 31 October 2014

For over 25 years, the IPCC has provided assessments of climate change, including:

- causes of climate change
- impacts and vulnerability
- response strategies - mitigation – adaptation

The Fifth Assessment Report, which was finalized in 2014, provides an update of knowledge related to climate change including information on:

- Socio-economic aspects of climate change and its implications for sustainable development
- More detailed regional information
- More precise considerations of risk, economics and ethics
- Stabilization of greenhouse gas concentrations

IPCC Fifth Assessment Report (AR5) now finalized

The IPCC has released its Fifth Assessment Report (AR5). This follows the overall mandate of the IPCC, the main activity of which is to prepare comprehensive assessment reports about climate change at regular intervals, typically of about five to seven years.

The IPCC's First Assessment Report (FAR) in 1990 played a decisive role in leading to the United Nations Framework Convention on Climate Change (UNFCCC), which was opened for signature at the Rio de Janeiro Summit in 1992. The Second Assessment Report (SAR) of 1995 provided key input for the negotiations of the Kyoto Protocol in 1997. The Third Assessment Report (TAR) of 2001 provided further information relevant to the development of the UNFCCC and the Kyoto Protocol. The Fourth Assessment Report (AR4) paid greater attention to the integration of climate change with sustainable development policies and the relationships between mitigation and adaptation, and led to a wider awareness of climate change issues in the general public and among decision-makers.

The Fifth Assessment, which was finalized in 2014, is made up of four reports: the three IPCC Working Groups' contributions dealing respectively with "The Physical Science Basis", "Impacts, Adaptation, and Vulnerability", and "Mitigation of Climate Change", and the Synthesis Report (SYR). Each report contains its own Summary for Policymakers (SPM) which is approved line by line by all member countries of the IPCC and represents a formally agreed statement on key findings and uncertainties.

The SPM of the WGI contribution on the "The Physical Science Basis" and the accepted final draft of its full report were released on 27 September 2013 and the full WGI report, comprising of the SPM, Technical Summary, 14 chapters and six annexes, was released online on 30 January 2014. The SPM of the WGI contribution on "Impacts, Adaptation, and Vulnerability" and the accepted final draft of its full report were released on 31 March 2014 while the full WGI report which includes the SPM, Technical Summary, 30 chapters, cross-chapter boxes and four annexes was released online on 15 October 2014. The SPM of the WGI contribution on "Mitigation of Climate Change" was launched on 13 April and the accepted final draft of its full report was released on 15 April 2014. The accepted final drafts of the Full Reports for all Working Groups were released in an unedited format. The Synthesis Report was released on 2 November 2014.

What is new in the AR5?

Some new features of AR5 as a whole include:

- A new set of scenarios for analysis across Working Group contributions;
- Dedicated chapters on sea-level change, the carbon cycle and climate phenomena such as monsoons and *El Niño*; and broader treatment of impacts, adaptation, and vulnerability in human systems and the ocean;
- Much greater regional detail on climate change impacts, adaptation and mitigation interactions; inter- and intra-regional impacts; and a multi-sector synthesis;
- Risk management and the framing of a response (both adaptation and mitigation), including scientific information relevant to Article 2 of the UNFCCC referring to the "...stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system".

The following issues were identified as being important and are treated consistently throughout the three Working Groups' contributions. **Key AR5 cross-cutting themes are:** Water and the Earth System: Changes, Impacts and Responses; Carbon Cycle including Ocean Acidification; Ice Sheets and Sea-Level Rise; Mitigation, Adaptation and Sustainable Development; and Article 2 of the UNFCCC.

Key AR5 cross-cutting methodologies are: Consistent Evaluation of Uncertainties and Risks; Costing and Economic Analysis; Regional Aspects; Treatment of Scenarios; and Greenhouse Gas Metrics.

The outlines of the Working Group contributions to the AR5 were developed after a comprehensive scoping process involving the scientific community and governments. The outline of the Synthesis Report was prepared at a Scoping Meeting in Liege (Belgium) in August 2010 and was revised and approved at the 32nd Session of the IPCC in Busan (Republic of Korea) in October 2010.

Outlines

(The full outlines, including the annexes are available at: www.ipcc.ch).

Working Group I Contribution to the IPCC Fifth Assessment Report Climate Change 2013: The Physical Science Basis

Summary for Policymakers

Technical Summary

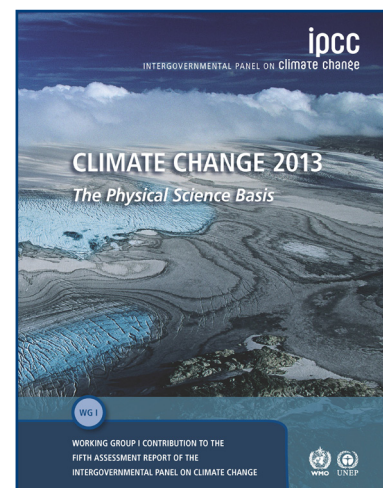
1. Introduction
2. Observations: Atmosphere and Surface
3. Observations: Ocean
4. Observations: Cryosphere
5. Information from Paleoclimate Archives
6. Carbon and Other Biogeochemical Cycles
7. Clouds and Aerosols
8. Anthropogenic and Natural Radiative Forcing
9. Evaluation of Climate Models
10. Detection and Attribution of Climate Change: from Global to Regional
11. Near-term Climate Change: Projections and Predictability
12. Long-term Climate Change: Projections, Commitments and Irreversibility
13. Sea Level Change
14. Climate Phenomena and their Relevance for Future Regional Climate Change

Plus a new Feature:

Annex I: Atlas of Global and Regional Climate Projections

What is new in the Working Group I Report?

- Improved treatment of regional information by specifically assessing key climate phenomena (monsoon, *El Niño*, etc.) and their relevance for future regional climate change;
- Assessment of the science of clouds and aerosols;
- An end-to-end assessment of sea level change;
- An end-to-end assessment of the carbon cycle;
- Extended coverage of climate change projections by assessing near- and long-term projections;
- Atlas of Global and Regional Climate Projections to enhance accessibility for users and stakeholders.



Working Group II Contribution to the IPCC Fifth Assessment Report Climate Change 2014: Impacts, Adaptation, and Vulnerability

Summary for Policymakers

Technical Summary

WGII AR5 Volume-wide Frequently Asked Questions (FAQs)

WGII AR5 Cross-Chapter Boxes

PART A: GLOBAL AND 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 security and food production systems

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: impacts, adaptation, and co-benefits
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

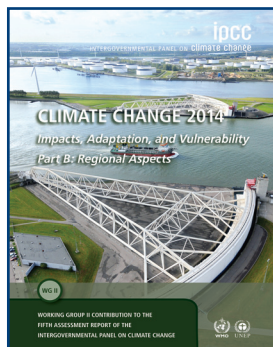


PART B: REGIONAL ASPECTS

21. Regional context

Regional chapters cover:

22. Africa
23. Europe
24. Asia
25. Australasia
26. North America
27. Central and South America
28. Polar Regions
29. Small Islands
30. The Ocean



What is new in the Working Group II Report?

There is an increased focus on the following information:

- Risk management framing
- Multiple stresses framing
- Expanded treatment of adaptation

More information is available on the impacts and costs of climate change for different sectors and regions. The report also assesses a broader range of impacts, including impacts on ocean systems.

Working Group III Contribution to the IPCC Fifth Assessment Report Climate Change 2014: Mitigation of Climate Change

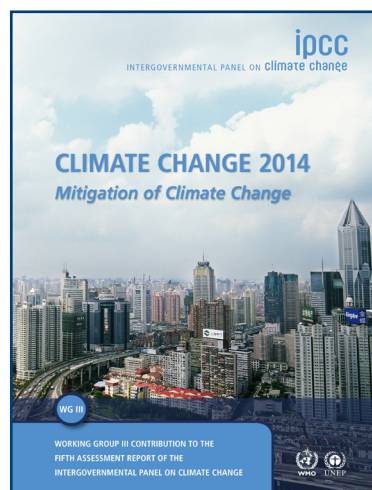
Summary for Policymakers

Technical Summary

1. Introductory Chapter
2. Integrated Risk and Uncertainty Assessment of Climate Change Response Policies
3. Social, Economic and Ethical Concepts and Methods
4. Sustainable Development and Equity
5. Drivers, Trends and Mitigation
6. Assessing Transformation Pathways
7. Energy Systems
8. Transport
9. Buildings
10. Industry
11. Agriculture, Forestry and Other Land Use (AFOLU)
12. Human Settlements, Infrastructure and Spatial Planning
13. International Cooperation: Agreements and Instruments
14. Regional Development and Cooperation
15. National and Sub-National Policies and Institutions
16. Cross-cutting Investment and Finance Issues

What is new in the Working Group III Report?

- Improved treatment of risk, uncertainty and ethical questions
- New set of socio-economic mitigation scenarios
- Integrated cross-sectoral and sectoral assessment of mitigation pathways and their implications for sustainable development, internationally discussed temperature goals and other policy objectives
- Consideration of delayed mitigation and limited availability of technologies
- Assessment of mitigation policies on the global, regional, national and sub-national level, including municipalities
- Assessment of mitigation investment needs and finance.



AR5 Synthesis Report

Introduction

Topic 1 - Observed Changes and their Causes

Topic 2 - Future Climate Changes, Impacts, and Risks

Topic 3 - Adaptation and Mitigation Measures

Topic 4 - Transformations and Changes in Systems

Box - Information relevant to Article 2 of the UNFCCC

Selection of Authors

The outlines of the Working Group contributions to AR5 were approved by the Panel in October 2009. Governments and participating organizations, including all UN organizations, were then asked to nominate experts who could serve as authors and Review Editors for the three Working Groups' contributions to the AR5. The final selection of 831 Coordinating Lead Authors (CLAs), Lead Authors (LAs) and Review Editors (REs) for the Reports made by the relevant Working Group Bureau from the list of nominated experts, plus other experts as appropriate based primarily on their publications and work, was announced on 23 June 2010.

The writing process started in November 2010 for Working Group I and in early 2011 for Working Groups II and III. Authors work in chapter teams to prepare and subsequently revise drafts based on comments provided by experts, governments and participating organizations. They participate in four lead author meetings. In addition IPCC Expert Meetings and Workshops related to a number of cross-cutting themes were held to assist authors in conducting the Assessment.

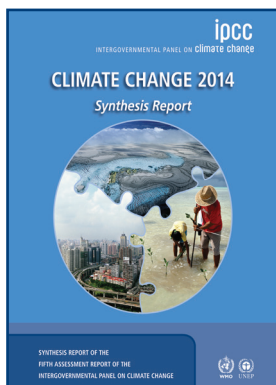
The composition of the group of Coordinating Lead Authors and Lead Authors for a chapter of the Assessment Report represents a range of views, expertise, gender and geographical representation (ensuring appropriate representation of experts from developing and developed countries and countries with economies in transition).

The Coordinating Lead Authors and Lead Authors selected by the Working Group Bureau may enlist other experts as Contributing Authors to assist with the work.

The composition of Core Writing Team of the Synthesis Report, led by the IPCC Chair, was agreed by the 45th Session of the IPCC Bureau, held in Geneva in March 2012. The team consisted of authors of the three Working Group report writing teams and members of the IPCC Executive Committee.

The preparation of IPCC reports follows clear procedures. IPCC Assessment Reports take into consideration the latest relevant scientific literature produced worldwide, involving an extensive circulation and review process. The review process involves a first review by a wide range of experts and a second review by governments and experts. Finally, the three Working Group reports are accepted by the Panel.

The Summaries for Policymakers (SPM) of the three Working Group reports and the SPM of the Synthesis Report (SYR) are approved line by line. The longer report of the SYR is adopted section by section.



The IPCC

The Intergovernmental Panel on Climate Change (IPCC) is the leading body for the assessment of climate change, established by the World Meteorological Organization and the United Nations Environment Programme. Its main activity is to prepare comprehensive assessment reports about climate change at regular intervals, typically of about five to seven years. IPCC reports should be neutral with respect to policy, although they may need to deal objectively with scientific, technical and socio-economic factors relevant to the application of particular policies.

The Fourth Assessment Report (AR4) was published in 2007, when the Panel was awarded the Nobel Peace Prize.

In May 2011, the IPCC Special Report on *Renewable Energy Sources and Climate Change Mitigation* was launched. The IPCC Special Report on *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation* was released in November 2011. These Special Reports also provide essential information for the Fifth Assessment Report.

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