The IPCC Process

Gerald A. Meehl
National Center for Atmospheric Research
Boulder, Colorado
The IPCC Assessments

The Intergovernmental Panel on Climate Change (IPCC) consists of about 190 governments that commission assessments performed by the international climate science community to determine the current state of human knowledge of climate and climate change.

The scientists are divided into three working groups:

Working Group 1: Climate science
Working Group 2: Climate impacts and adaptation
Working Group 3: Mitigation
The IPCC
established by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO) in 1988 to provide the world with a clear scientific view on the current state of knowledge in climate change and its potential environmental and socio-economic impacts. In the same year, the UN General Assembly endorsed the action by WMO and UNEP in jointly establishing the IPCC.
The IPCC assessments

--Provide the current state of human knowledge on climate variability and change

--An assessment, not a review

--Policy-relevant, but not policy-prescriptive

--Transparent (two stages of open international review; each comment documented and responded to by the lead authors; each chapter for each round of review receives ~1500 comments; all comments and responses can be traced and are available at the end of the process)

--Calibrated uncertainty language
IPCC “calibrated uncertainty language” to communicate assessment of uncertainty

### Table 1. Likelihood Scale

<table>
<thead>
<tr>
<th>Term*</th>
<th>Likelihood of the Outcome</th>
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</thead>
<tbody>
<tr>
<td>Virtually certain</td>
<td>99-100% probability</td>
</tr>
<tr>
<td>Very likely</td>
<td>90-100% probability</td>
</tr>
<tr>
<td>Likely</td>
<td>66-100% probability</td>
</tr>
<tr>
<td>About as likely as not</td>
<td>33 to 66% probability</td>
</tr>
<tr>
<td>Unlikely</td>
<td>0-33% probability</td>
</tr>
<tr>
<td>Very unlikely</td>
<td>0-10% probability</td>
</tr>
<tr>
<td>Exceptionally unlikely</td>
<td>0-1% probability</td>
</tr>
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*Additional terms that were used in limited circumstances in the AR4 (extremely likely – 95-100% probability, more likely than not – >50-100% probability, and extremely unlikely – 0-5% probability) may also be used in the AR5 when appropriate.*
The IPCC assessments

First Assessment Report, 1990
Second Assessment Report, 1995
Third Assessment Report, 2001
Fourth Assessment Report, 2007
Fifth Assessment Report, 2013

Governments will meet after the conclusion of the AR5 to decide whether there will be an AR6
<table>
<thead>
<tr>
<th>Time line</th>
<th>Working Group I contribution to the IPCC Fifth Assessment Report</th>
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<tbody>
<tr>
<td><strong>2009</strong></td>
<td>Two scoping meetings: governments ask scientists for climate information on certain topics; an outline for the AR5 is proposed</td>
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<tr>
<td><strong>Early 2010</strong></td>
<td>Lead authors nominated by participating countries and chosen</td>
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<tr>
<td><strong>November 2010</strong></td>
<td><strong>First Lead Authors Meeting</strong> (Kunming, China), work on Zero Order Draft</td>
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<tr>
<td><strong>July 2011</strong></td>
<td><strong>Second Lead Authors Meeting</strong> (Brest, France), work on First Order Draft</td>
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<tr>
<td><strong>December 2011-February 2012</strong></td>
<td><strong>Expert Review of the First Order Draft</strong></td>
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<tr>
<td><strong>April 2012</strong></td>
<td><strong>Third Lead Authors Meeting</strong> (Marrakech, Morocco) respond to comments on FOD, formulate Second Order Draft; formulate first drafts of Technical Summary (TS) and Summary for Policymakers (SPM)</td>
</tr>
<tr>
<td><strong>January 2013</strong></td>
<td><strong>Fourth Lead Authors Meeting</strong> (Hobart, Tasmania, Australia) respond to comments on Second Order Draft; respond to comments on the Technical Summary and Summary for Policymakers</td>
</tr>
<tr>
<td><strong>Jun-Aug 2013</strong></td>
<td>Final Government Distribution of the WGI AR5 chapters, TS and SPM</td>
</tr>
<tr>
<td><strong>September 2013</strong></td>
<td>WGI AR5 SPM Approval Plenary, Stockholm, Sweden</td>
</tr>
</tbody>
</table>
Working Group I Contribution to the IPCC Fifth Assessment Report (IPCC AR5)

Chapter 1: Introduction
Chapter 2: Observations: Atmosphere and Surface
Chapter 3: Observations: Ocean
Chapter 4: Observations: Cryosphere
Chapter 5: Information from Paleoclimate Archives
Chapter 6: Carbon and Other Biogeochemical Cycles
Chapter 7: Clouds and Aerosols
Chapter 8: Anthropogenic and Natural Radiative Forcing
Chapter 9: Evaluation of Climate Models
Chapter 10: Detection and Attribution of Climate Change: from Global to Regional
Chapter 11: Near-term Climate Change: Projections and Predictability
Chapter 12: Long-term Climate Change: Projections, Commitments and Irreversibility
Chapter 13: Sea Level Change
Chapter 14: Climate Phenomena and their Relevance for Future Regional Climate Change
The IPCC WGI AR4 Report  (final numbers not yet available for the AR5)

Over 2000 Experts from 76 countries nominated

178 Coordinating Lead Authors, Lead Authors, and Review Editors from 32 countries
(for the AR5: 302 Coordinating Lead Authors, Lead Authors, and Review Editors)

498 Contributing Authors from 28 countries

Over 6,000 peer-reviewed publications cited

The Reviews  Over 30,000 comments from:  625 Expert Reviewers, from 42 countries  27 Governments

The Summary for Policymakers was approved line-by-line by 113 Governments in the Paris Plenary, January 2007
The IPCC Final Plenary

Delegations from the IPCC governments convene to approve the final report.

This involves going over the Summary for Policymakers (SPM) line-by-line.

85% is an exercise of lead authors and government delegations working together to clarify wording and clearly communicating the main results so the governments understand the report.

15% is governments trying to change certain conclusions.

The scientists are there to make sure the science isn’t distorted, and that the conclusions are communicated clearly.
Model experiments show that forcing agents are held constant at 1990 levels, the "committed warming" trend would continue beyond the two decades at a rate of about 0.1°C per decade, due mainly to the slow response of the oceans. About twice as much warming (0.2°C per decade) would be expected if emissions are within the range of the SRES scenarios—none of which considered climate initiatives. Best-estimate projections from models indicate that decadal-average warming over each inhabited continent by 2030 is insensitive to the choice among SRES scenarios and is very likely to be at least twice as large as the corresponding model-estimated natural variability during the 70th century.
An example of wording clarification from the IPCC AR4 Plenary:

Original text in SPM:

‘Model experiments show that even if all forcing agents were held constant at year 2000 levels, a “committed warming” trend would occur in the next two decades at a rate of about 0.1°C per decade…’

Governments didn’t understand “committed warming”, and “committed” didn’t translate well into some languages; so alternate wording that communicates the same conclusion was negotiated:

“further warming” replaced “committed warming”

The final wording:

‘Model experiments show that even if all forcing agents were held constant at year 2000 levels, a further warming trend would occur in the next two decades at a rate of about 0.1°C per decade…’
The media and the IPCC

Late in 2007, the IPCC won the Nobel Peace Prize, jointly with Al Gore Jr. “for their efforts to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that are needed to counteract such change.”
IPCC controversies

--After the Second Assessment Report in 1995, changes agreed to in the final plenary were authorized by the governments to be added to the SPM by the assigned lead authors. Later, there were charges that a few lead authors made changes on their own. These charges were unfounded, but lead authors were attacked directly by the media and critics.

--Subsequently, review editors (at least two per chapter) were instituted to oversee the review and editing process to stand between the lead authors and critics to explain and defend the process.
IPCC controversies

After the AR4 in 2009, thousands of emails were stolen from a server ("climate-gate") and several AR4 lead authors’ emails were cited out of context to try and ruin those scientists’ credibility, with the goal of then discrediting the IPCC AR4

Multiple subsequent investigations in the U.S. and U.K. have cleared those scientists of any wrong-doing, and the IPCC AR4 science stands

Errors in the AR4?

Two minor errors were found: both in WG II. These were on (i) Himalayan glaciers melt (this was correct in WG I), and (ii) The area of Netherlands below sea level.

These errors were corrected, and a better errata procedure has been instituted for the AR5
Things to look for in the AR5:

How strong will the “smoking gun” statement be?

Evolution of assessment of human influence on climate:


“There is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities”. --IPCC Third Assessment Report, 2001

“Most of the observed increase in globally averaged temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations”. --IPCC Fourth Assessment Report, 2007
Things to look for in the AR5:

What will be the assessed range in equilibrium climate sensitivity?

*From 1979 until the AR4, the range was 1.5°C to 4.5°C; in the AR4 the range was assessed as 2.0°C to 4.5°C with a best estimate of 3°C*

What will be the assessed range of possible future global sea level rise, and what will be the latest regarding the stability of the Greenland and Antarctic ice sheets?

*The AR4 was criticized as being too conservative, but there were no published papers that quantified possible ice sheet melt contributions to future sea level rise*

What will be the latest assessment on future weather and climate extremes (temperature, precipitation and hurricanes)?

What will be the assessed near-term climate change over the next few decades? (a new field of study called “decadal climate prediction”)
The IPCC AR5 Working Group 1 report will be released on September 27, 2013
Inside the IPCC Climate Science Assessments: From 1990 to 2013

Gerald A. Meehl
NCAR Senior Scientist, IPCC Scientist
National Center for Atmospheric Research

www.cgd.ucar.edu/staff/meehl
Relevant Websites

1. IPCC,  [www.ipcc.ch](http://www.ipcc.ch)

2. UCAR,  [www.ucar.edu](http://www.ucar.edu)


5. Gerald A. Meehl – NCAR staff site,  [www.cgd.ucar.edu/staff/meehl](http://www.cgd.ucar.edu/staff/meehl)

6. UForum at UCAR,  [http://president.ucar.edu/university-relations/uforum](http://president.ucar.edu/university-relations/uforum)