

EIGHTH SESSION OF WORKING GROUP II OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE: 2-6 APRIL 2007

The eighth session of Intergovernmental Panel on Climate Change (IPCC) Working Group II took place at the Charlemagne Building, Brussels, Belgium, from 2-6 April 2007. The meeting was attended by 366 participants, including scientists and representatives from governments, UN agencies and non-governmental organizations. The meeting resulted in the acceptance of Working Group II's (WGII) contribution to the IPCC Fourth Assessment Report (AR4), titled "Climate Change 2007: Impacts, adaptation and vulnerability," including approval of the Summary for Policy Makers (SPM) and acceptance of the underlying report and Technical Summary.

The key findings of the SPM emphasize the observed and projected impacts of climate change, including accumulating evidence that changes in many physical and biological systems are linked to anthropogenic warming. According to the SPM, observed and projected impacts of climate change include various changes in the natural environment, flooding, and food and water shortages. Among other things, the SPM states that 20-30% of plant and animal species are likely to face extinction with temperature rises exceeding 1.5-2.5°C. It indicates that hundreds of millions of people will be exposed to increased water stress, many millions more people are projected to be exposed to flooding every year, and access to food in many African countries is projected to be severely compromised. The SPM also highlights other vulnerabilities and potential negative impacts of climate change on sustainable development. It states that adaptation will be necessary to the already unavoidable warming, but many impacts can be avoided, reduced or delayed by mitigation.

The process leading to the adoption of the SPM was generally viewed as laborious. At the meeting, delegates addressed the five sections of the SPM, however they did not even consider the last two sections until after 10:00 pm on the final day of negotiations. The meeting was scheduled to end on Thursday, 5 April, with a press conference on Friday morning. Nevertheless, discussions on the SPM continued throughout the night and the SPM was finalized at 10:00 am on Friday morning and formally adopted that afternoon.

A BRIEF HISTORY OF THE IPCC AND AR4

The IPCC was established in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP). The purpose of the IPCC is to assess the scientific, technical and socioeconomic information relevant to understanding the risks associated with human-induced climate change. The IPCC does not undertake new research, nor does it monitor climate-related data, but bases its assessments on published and peer-reviewed scientific and technical literature. The IPCC Secretariat is located in Geneva, Switzerland, and is staffed by the WMO and UNEP.

The IPCC has three working groups: Working Group I (WGI) addresses the scientific aspects of the climate system and climate change; Working Group II (WGII) addresses the vulnerability of socioeconomic and natural systems to climate change, negative and positive consequences of climate change, and adaptation options; and Working Group III (WGIII) addresses options for limiting greenhouse gas emissions and otherwise mitigating climate change.

The IPCC also has a Task Force on National Greenhouse Gas Inventories. The Task Force oversees the IPCC National Greenhouse Gas Inventories Programme, which aims to develop and refine an internationally-agreed methodology and software for the calculation and reporting of national

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This issue of the *Earth Negotiations Bulletin* © <enb@iisd.org> is written and edited by María Gutiérrez, Kati Kulovesi and Miquel Muñoz. The Editor is Pamela S. Chasek, Ph.D. <pam@iisd.org> and the Director of IISD Reporting Services is Langston James "Kimo" Goree VI <kimo@iisd.org>. The Sustaining Donors of the *Bulletin* are the United Kingdom (through the Department for International Development - DFID), the Government of the United States of America (through the Department of State Bureau of Oceans and International Environmental and Scientific Affairs), the Government of Canada (through CIDA), the Danish Ministry of Foreign Affairs, the Government of Germany (through the German Federal Ministry of Environment - BMU, and the German Federal Ministry of Development Cooperation - BMZ), the Netherlands Ministry of Foreign Affairs, the European Commission (DG-ENV) and the Italian Ministry for the Environment and Territory General Directorate for Nature Protection. General Support for the *Bulletin* during 2007 is provided by the Swiss Federal Office for the Environment (FOEN), the Norwegian Ministry of Foreign Affairs and the Ministry of Environment, the Government of Australia, the Austrian Federal Ministry for the Environment, the Ministry of Environment of Sweden, the New Zealand Ministry of Foreign Affairs and Trade, SWAN International, the Japanese Ministry of Environment (through the Institute for Global Environmental Strategies - IGES) and the Japanese Ministry of Economy, Trade and Industry (through the Global Industrial and Social Progress Research Institute - GISPRI). Funding for translation of the *Earth Negotiations Bulletin* into French has been provided by the International Organization of the Francophonie (IOF) and the French Ministry of Foreign Affairs. Funding for the translation of the *Earth Negotiations Bulletin* into Spanish has been provided by the Ministry of Environment of Spain. The opinions expressed in the *Earth Negotiations Bulletin* are those of the authors and do not necessarily reflect the views of IISD or other donors. Excerpts from the *Earth Negotiations Bulletin* may be used in non-commercial publications with appropriate academic citation. For information on the *Bulletin*, including requests to provide reporting services, contact the Director of IISD Reporting Services at <kimo@iisd.org>, +1-646-536-7556 or 212 East 47th St. #21F, New York, NY 10017, USA.

greenhouse gas emissions and removals, and to encourage the use of this methodology by countries participating in the IPCC and by United Nations Framework Convention on Climate Change (UNFCCC) signatories. The IPCC Bureau, comprised of 30 members elected by the Panel, assists the IPCC Chair in planning, coordinating and monitoring progress in the work of the IPCC.

Since its inception, the IPCC has prepared a series of comprehensive assessments, special reports and technical papers, which provide scientific information on climate change to the international community, including policymakers and the public. This information has played an important role in negotiations under the UNFCCC and in framing national and regional policies.

The IPCC completed its initial comprehensive assessments of climate change in the First Assessment Report in 1990 and the Second Assessment Report in 1995. The IPCC's Third Assessment Report (TAR), completed in 2001, addresses policy-relevant scientific, technical, and socioeconomic dimensions of climate change, and concentrates on findings since 1995 at both regional and global levels. The TAR, which was subject to extensive review from experts and governments, is composed of a comprehensive assessment from the three IPCC working groups, a Summary for Policy Makers (SPM) and Technical Summary of each working group report, and a Synthesis Report. The IPCC's Fourth Assessment Report (AR4) is due to be completed in November 2007, in Valencia, Spain.

Special reports prepared by the IPCC include the Special Report on Safeguarding the Ozone Layer and the Global Climate System, accepted at IPCC-23 (8 April 2005, Addis Ababa, Ethiopia) and the Special Report on Carbon Dioxide Capture and Storage, accepted at IPCC-24 (26-28 September 2005, Montreal, Canada).

The IPCC Guidelines for National Greenhouse Gas Inventories were first released in 1994, and a revised set was completed in 1996. In 2000 and 2003 the Panel approved additional good practice guidance reports that complement the Revised 1996 Guidelines. In 2006 the IPCC approved the 2006 IPCC Guidelines.

AR4: The IPCC decided to continue preparing comprehensive assessment reports at IPCC-18 (24-29 September 2001, London, UK). Subsequent meetings discussed the timing and other details of the report, with participants agreeing to late 2007 as the completion date for the AR4. The overall outline of the working groups' contributions to the AR4 was accepted at IPCC-21 (19-21 February 2003, Paris, France). That same year, the scope and outline of AR4 were developed during two scoping meetings (April, Marrakesh, Morocco, and September, Potsdam, Germany), and the author teams were assembled. Another scoping meeting was held in 2004 in Geneva, Switzerland, on the AR4 Synthesis Report (SYR). IPCC-22 (9-11 November 2004, New Delhi, India) decided the SYR outline of topics to be addressed. At its 35th session, the IPCC Bureau agreed on the composition of the Core Writing Team and Review Editors for the SYR, and the list was presented to the Panel at IPCC-25 (26-28 April 2006, Port Louis, Mauritius).

The AR4 is structured in three parts, one for each working group. The working groups' contribution comprises the underlying assessment report, a Technical Summary, Executive Summary, and a Summary for Policymakers, which undergoes a thorough review process. The review process generally takes place in three stages: a first review by experts, a second review by experts and governments, and a third review by governments. In addition to the three working groups' contributions, the AR4 also comprises a Synthesis Report, which, like the SPMs, will be approved line-by-line by the IPCC. More than 2500 expert reviewers, 800 authors, 450 lead authors, and 130 countries have participated in the elaboration of the AR4.

WGI met in from 29 January to 1 February 2007, in Paris, France, and approved its contribution to the AR4, including the SPM, the Technical Summary and underlying reports. WGIII will meet in Bangkok, Thailand, from 30 April to 3 May 2007 to approve its contribution the AR4. The final AR4 is scheduled to be accepted at IPCC-27 in November 2007, in Valencia, Spain.

EIGHTH IPCC WGII REPORT

The eighth session of Working Group II of the IPCC opened in Brussels, Belgium, on Monday, 2 April 2007. It was scheduled to conclude on Thursday 5 April 2007, but went over its allotted time and was officially closed at 1:46 pm on Friday, 6 April. During the four-and-a-half day meeting, delegates met in plenary, informally and in contact groups to consider the WGII contribution to the IPCC Fourth Assessment Report. By the end of the meeting, WGII had approved the Summary for Policy Makers (SPM) and accepted the underlying report and Technical Summary.

This summary report of the meeting first addresses the opening ceremony and then the line-by-line approval of each section of the draft SPM, followed by the consideration and acceptance of the underlying report and Technical Summary, and the closing session.

OPENING CEREMONY

On Monday morning, WGII Co-Chair Osvaldo Canziani (Argentina) opened the session. Belgian Prime Minister Guy Verhofstadt said Europe is leading the way in taking responsibility for global warming, and highlighted the European Council decisions on climate change. Stressing the role of the IPCC in shaping public opinion, and noting past public confusion due to mixed messages on climate change, Verhofstadt said that the IPCC has ended the climate change debate with WGI clearly stating that global warming is an incontestable fact and human activities are responsible for it. Noting that taxes are one of the governments most powerful tools, Verhofstadt urged a shift from property and labor taxation towards consumption and pollution taxation.

Stavros Dimas, European Commissioner for the Environment, highlighted the "historic" European Council decisions, which he said will have an impact not only climate change, but also on EU's energy security and economic competitiveness. Dimas underscored the need for international cooperation and a new treaty after the Kyoto Protocol's first commitment period. He called for differentiated emissions targets for developed and developing countries, noting that developing countries that reach economic development levels similar to developed

countries should assume commitments. Stressing the need for the US and Australia to make commitments and collaborate, he said negotiations should be launched at the next UNFCCC meeting to be held in Bali in November 2007. Dimas stressed that deforestation must be halted within two decades and then reversed. He explained that emissions from aviation will be included in the European Union Emissions Trading Scheme (EU ETS) and noted interest from California to link its carbon trading initiative to the EU ETS.

Hong Yan, WMO, commended the solid reputation of the IPCC and the importance of its previous reports for the negotiations on the UNFCCC and the Kyoto Protocol, and for national and regional climate policies. He hoped that this meeting would provide a useful forum for dialogue between the experts who have prepared the WGII report and its main users. Highlighting the importance of outreach activities, he urged participants to distribute information contained in AR4 to decision-makers at all levels.

IPCC Chair Rajendra Pachauri underscored the serious implications of the complex and wide set of changes in climate identified by WGI for natural and social systems around the globe. Stressing new information since the TAR, he highlighted the importance of the WGII report in identifying linkages between climate change and sustainable development around the world, and for the implementation of adaptation and mitigation measures.

Renate Christ, IPCC Secretary, read a welcome address from UNEP Executive Director Achim Steiner, noting that AR4 comes at a defining moment in the climate change debate and underscoring WGI's contribution, which conclusively answered the question of whether humans are affecting the climate. In the message, Steiner highlighted the WGII draft contribution to the AR4 and overwhelming evidence on escalating negative impacts, and welcomed the focus on adaptation as complementary to mitigation.

Delegates approved the agenda (WG-II:8th/Doc.1).

Co-Chair Canziani, noted that the WGII report is based on the work of 174 Lead Authors, 222 contributing authors and the participation of 1183 experts. He presented an overview of changes in the WGII contributions since the First Assessment Report, highlighting the introduction of cross-cutting issues and sectors, information on sustainable development, cost-benefit analyses and methodologies. He drew attention to the integrated analysis in the AR4, which he said has improved but needs to be further developed.

WGII Co-Chair Martin Parry (UK) noted the TAR recommendations for AR4 that had been taken up insofar as possible, including incorporating: more quantified assessments; more complete regional coverage; more about context, multiple stresses and sustainable development; the role of adaptation and of mitigation; assessment of thresholds and non-linearities; and more on currently observed effects. He highlighted greater use of empirical studies rather than models, and the incorporation of information on impacts of inaction and how effects might vary under different development pathways. Co-Chair Parry also recalled IPCC decisions that had been implemented, such as making the WGII contribution more concise, establishing better

connections with work done by WGI and WGIII, and making wider use of non-English and "grey" (government and NGO reports) literature.

Co-Chair Parry announced that Lead Author presentations, explaining the underlying text for each section, would be given as appropriate during discussions.

SUMMARY FOR POLICYMAKERS

Assisted by the nearly 50 Lead Authors, WGII discussed the SPM line-by-line in plenary, in small drafting groups and in contact groups for the rest of the week. Discussions were based on the draft SPM (WG-II:8th/Doc.2a) with a number of changes introduced to reflect comments by governments and organizations (WG-II:8th/INF.1). Discussions and key outcomes of the SPM are summarized below based on the structure of the approved SPM, which includes the following sections:

- A – Introduction;
- B – Current knowledge about observed impacts of climate change on the natural and human environment;
- C – Current knowledge about future impacts;
- D – Current knowledge about responding to climate change; and
- E – Systematic observing and research needs.

The final text of the WGII SPM can be downloaded from the IPCC website at <http://www.ipcc.ch>.

A – INTRODUCTION: The introductory section was approved on Monday afternoon with minor amendments.

Final Text: This short section explains that WGII's contribution to the AR4 is to describe current scientific understanding of impacts of climate change on natural, managed and human systems, their capacity to adapt and their vulnerability. The introduction clarifies that the findings build on past IPCC assessments and incorporate new knowledge since the TAR.

B – CURRENT KNOWLEDGE ABOUT OBSERVED IMPACTS OF CLIMATE CHANGE ON THE NATURAL AND HUMAN ENVIRONMENT: This section was first addressed by plenary on Monday morning, and discussions continued in plenary, contact groups and informal discussion until Friday morning. Discussions focused, *inter alia*, on the title of the section, reference to WGI findings, reference to data gaps, and confidence levels.

In introducing the section, Co-Chair Parry highlighted inequitable spatial coverage and stressed focus on the effects of observed changes.

The title of Section B was considered on Monday morning. Criticizing the proposed title "current knowledge about observed impacts in natural, managed and human systems" as too academic, the UK suggested simplifying the language, and also removing the wording "current knowledge." Co-Chair Parry said that reference to "current knowledge" in various sections of the SPM was meant to explain the nature of the IPCC's work. After informal lunchtime consultations, WGII agreed to the new title referring to the "natural and human environment."

On text referring to WGI findings, France expressed concerns over wording on "long-term" climate changes, and stressed that focus should be on recent and future changes. The UK proposed emphasizing that the recent warming is connected to human activities. Suggesting reference to "last 50 years," the Russian Federation highlighted that changes between the 1910s and

1940s are more difficult to attribute to human activities than those between the 1970s and today. Having consulted informally, delegates agreed to indicate that a full consideration of observed climate change is provided in the WGI contribution to AR4.

On a sentence on the scope of the section, the US said the language should reflect the difference between changes in climate, and changes in the natural systems. After some clarification on when the terms “observed” and “recent” referred to changes in climate or natural systems, delegates agreed to modified text proposed by Co-Chair Parry.

Delegates discussed a paragraph on the increase in studies since the TAR, including how to refer to limitations in coverage. When first considering the question in plenary on Monday, the US suggested a general reference to the paucity of coverage in many regions, instead of singling out Africa and Southeast Asia. Saint Lucia, supported by New Zealand, proposed adding a reference to small islands. Switzerland, opposed by the UK, proposed referring to limitations and caveats only in a later section. Based on the discussion, Co-Chair Parry introduced new text on Tuesday morning, which also referred to improved data quality in developed countries. Pakistan stressed that data has not improved in all developed countries. Co-Chair Parry, opposed by Morocco, suggested reference to North America and Europe. Saint Lucia proposed to add the Caribbean to the list of regions with data gaps. The US opposed, saying that the list reflected the underlying chapters where the Caribbean is not listed. The UK proposed saying “some developing countries,” with Sudan, South Africa and others preferring maintaining reference to specific regions. The final text refers to lack of geographical balance and “marked scarcity in developing countries.”

A bold header, which stated with “very high confidence” that many natural systems, in all continents and some oceans, are being affected by regional climate changes, particularly temperature increases, was discussed in plenary and in a contact group co-chaired by Belgium and Sudan.

China, supported by Saudi Arabia, proposed changing the statement’s confidence level from “very high confidence” to “high confidence.” France, Austria, Belgium, UK, US, Germany, Canada and others opposed changing the confidence level from what had been assessed by the Lead Authors. The UK, opposed by China, proposed using a likelihood statement noting that the impacts are “very likely.”

The Lead Authors restated their “very high confidence” on the statement. They explained the rationale that when independent lines of evidence, each having a similar outcome and each carrying “high confidence” by themselves, are evaluated collectively, they imply a much higher confidence due to their consistent conclusion.

The question was returned to plenary early on Friday morning. The Lead Authors elaborated on the scientific basis for the statement. Saying that scientists in his delegation disagreed, China, supported by Saudi Arabia, continued to oppose the “very high” confidence level. The Lead Authors requested that if the “very” were removed, a footnote be inserted noting that the authors do not agree with the statement and that the authors have “very high” confidence that natural systems are being affected by regional climate change. They added that having a government questioning widely-employed and sound methodologies and

then putting into question the work of Lead Authors was unprecedented in the IPCC, and asked to record a formal protest. When the matter was taken up again at the end of the meeting, the US suggested deleting the confidence level and leaving the rest of the statement. Japan, with the Lead Authors “strongly supporting,” called for inserting a footnote stating the Lead Authors’ views that the statement carried a very high confidence level. In the final text, the confidence level has been omitted and no footnote has been included.

A paragraph relating to **snow, ice and frozen ground** was considered on Monday and Tuesday, with delegates discussing glacier lake outbursts, reference to “physical systems,” and ground instability.

Germany asked about the basis for selecting glacial lakes, ground instability and polar regions as the examples. A Lead Author replied that the three selected cases are the most relevant ones. China questioned whether this was the right place to refer to other important potential impacts, such as increased risk of glacial lake outburst floods. France, Peru and Pakistan proposed their inclusion, but the Lead Authors indicated there is no evidence in the literature, and Co-Chair Parry elaborated that the problem is establishing the relationship with climate change. Tajikistan noted existing literature in Russian.

On ground instability in permafrost regions, the UK indicated that the crucial distinction was one between direct and indirect impacts, rather than physical and non-physical environments. Using bird nesting time as an example, Co-Chair Parry responded that there may not be enough of a knowledge-base to tease out second and third order impacts.

On the overall structure of the paragraph, Co-Chair Parry proposed first summarizing WGI conclusions on changes in physical systems, and then stating that WGII has high confidence that these changes in regions of snow, ice and frozen ground are affecting natural systems, for example, through the enlargement and increased numbers of glacial lakes, increasing ground instability of permafrost regions, and rock avalanches. Austria drew attention to the different spheres, with the US stating that this discussion only related to the cryosphere and proposing deleting reference to physical systems. Colombia proposed discussing direct and indirect impacts without explaining the physical systems. The paragraph was deferred to informal consultations. After informal consultations, WGII agreed to text introduced on Tuesday morning that omitted reference to “physical systems” and included some other small changes.

Concerning changes in **hydrological systems**, the issues discussed focused on the confidence level, how to best express the number and significance of systems involved, and what was meant by “systems.” On the level of confidence, the US proposed using “emerging evidence,” while Austria, Norway and others preferred retaining the proposed wording “high confidence.” WGII agreed to text combining both propositions. Discussions on whether “some” or “many” systems are affected were resolved after the Lead Authors explained that four of at least ten types of systems were affected, and Saudi Arabia proposed language on the “following” types of systems, followed by a list. Switzerland, opposed by Norway, proposed specific reference to the Alps and Andes, with WGII deciding not to

include it. Germany and Egypt highlighted sea-level rise. Ireland proposed, and WGII agreed to, language saying “around the world” to refer to the range of the effects.

On changes in **biological systems**, Germany proposed, and WGII agreed, to reinsert language from the Technical Summary stating that recent warming is strongly affecting terrestrial and biological systems. WGII also agreed to a US proposal to delete reference to increasing atmospheric carbon dioxide concentrations, and to a proposal by Switzerland to refer instead to recent warming. Reference to “thermal” growing seasons was included after Zimbabwe underscored shorter growing seasons and decreased yield production in Africa.

On changes in **marine and freshwater biological systems**, WGII agreed to a US proposal to include reference to “substantial new evidence” on observed changes being associated with rising water temperatures. Noting that two out of three examples have “high confidence,” China asked about the basis for stating “very high confidence” in the chapeau. Australia highlighted the need to err on the conservative side to avoid the impression that the IPCC has overstated confidence levels, and WGII agreed to “high confidence” language.

On **ocean acidification**, delegates considered the link between acidity of ocean waters and increased absorption of atmospheric carbon dioxide. China questioned reference to modeled evidence. Opposed by Austria, Co-Chair Parry proposed and WGII agreed to delete mention of modeled evidence. Noting the WGI report, China, opposed by Norway, suggested removing the entire statement on ocean acidification. Delegates agreed to a new wording that indicates that since 1750 oceans have become more acidic.

On **global assessment** data, Co-Chair Parry explained that, in response to government comments, a box on using climate models and spatial pattern analysis in linking the causes of climate change to observed effects in natural systems was removed. A Lead Author presented the sets of evidence used on a global scale assessment of data since 1970 showing that it is likely that anthropogenic warming has had a discernible influence on many physical and biological systems.

On a statement on consistency between changes in physical and biological systems and warming, delegates discussed numbers and text in plenary and in three contact group meetings. Responding to questions from China, Australia, the US and others, the Lead Authors detailed the data-selection process and explained the statistical significance of the data sets. Delegates agreed to insert a footnote describing the selection process of the 29,000 data series, from about 80,000 data series from 577 studies. China questioned a statement noting that “more than 90%” of the 29,000 data series is consistent with warming. After further clarification from the Lead Authors, delegates agreed to refer to “more than 89%.”

On text noting agreement between observed system responses and anthropogenic warming in modeling studies, Belgium proposed and WGII agreed to insert language explaining natural and anthropogenic forcing. Several other suggestions were made to clarify the language and to make it consistent with that used by WGI.”

Discussions on a paragraph on effects of temperature increases on **managed and human systems** focused on reference to coastal zones, present impacts and adaptation, and consideration of other variables than temperature change. Colombia, supported by France, the US, Spain, Niger and Argentina underscored the importance of emphasizing adaptation to present effects and which impacts can be addressed by adaptation. Austria said the language should clarify that it refers only to temperature changes. France said text was needed explaining why other variables had not been used. Co-Chair Parry noted that the assessment had only been done with respect to temperature. South Africa expressed concern about the lack of representation of Africa in the section. Germany and Spain proposed, and WGII agreed, to include the effects of sea-level rise.

Final Text: The final text explains that the focus of Section B is on the relationship between observed climate change and recent observed changes in the natural and human environment. It highlights new and improved data since the TAR, allowing a broader and more confident assessment.

The SPM states that many natural systems are affected by regional climate changes, based on observational evidence from all continents and most oceans. The text provided statements and examples concerning changes in: snow, ice and frozen ground; hydrological systems; terrestrial biological systems; marine and freshwater biological systems; and ocean acidification.

Section B also states, on the basis of global data since 1970, that anthropogenic warming has had a discernible influence on many physical and biological systems. It explains evidence underlying this finding, and identifies limitations and gaps preventing more complete assessment.

The text also indicates that other effects of regional climate changes on natural and human environments are emerging but they are difficult to discern due to adaptation and non-climatic drivers. It provides some detailed examples of such effects.

C – CURRENT KNOWLEDGE ABOUT FUTURE IMPACTS: The section on future impacts was first addressed by the plenary on Tuesday evening, and discussions continued in plenary, contact groups and informal discussion until Friday morning. Issues discussed included the structure of the section, which resulted in a decision to add text on adaptation.

In his presentation of the section, Co-Chair Parry highlighted the focus on vulnerability, exposure and adaptive capacity, with adaptation resulting from national and international decisions considered in Section D. He explained the approach of reviewing available new literature, scenario-based studies, sensitivity studies and vulnerability assessments, and inferring impacts from this knowledge.

The US, supported by Saudi Arabia, criticized the structure of the SPM separating impacts and adaptation, and lamented Section C’s focus on key selected impacts. Co-Chair Parry indicated that the structure was the same as in the earlier draft, and emphasized the rationale for disaggregating impacts from adaptation. Saudi Arabia stressed that separation is impossible as nature will adapt without human interference. Several other delegates supported the existing structure of the report. France indicated that the separation between impacts and adaptation was based on the literature. Austria and South Africa highlighted the structure’s relevance for policymakers, and Australia

stressed the link between the structure and the risk management process, which involves identifying vulnerability and impacts, making a decision on adaptation response and re-assessment of vulnerability.

Reconvening the plenary on Wednesday morning, Co-Chair Parry explained that in response to the discussion, a final paragraph would be added at the end of each part concerning risks that discusses adaptation and adaptive capacity. Early on Friday morning, the US, noting all the new paragraphs on adaptation, proposed to include the word “adaptation” in Section C’s title, but WGII did not agree on this proposal.

Water: On Wednesday, delegates discussed freshwater resources and their management. Concerning water runoff and water availability, the main issues discussed included a draft map showing changes in runoff, and the inclusion of numerical figures.

Algeria, China, Ghana, Mali and others questioned a map that showed a high increase in water runoff in the Sahara. Co-Chair Parry explained that since the map showed percentage increases, the change appeared significant in a dry region although runoff remained low. The Lead Authors explained that models do not provide consistent projections for the Sahara, which is why the area could have been masked in the water run-off map. However, they had preferred to provide a projection by using the mean value of 19 studies. Co-Chair Parry said alternatives included a map showing millimeter per day changes or omitting the map. The Russian Federation, South Africa, Togo and others emphasized the importance of having a map. Consideration of the map continued informally. On Thursday afternoon, a new map was introduced showing changes in millimeters per day. Mali proposed deleting it, but was opposed by Austria, Australia, Switzerland, Spain, South Africa, Syria and others. Agreement was not reached and the final SPM contains no map on water runoff.

India and Saudi Arabia expressed concern over numbers projecting increases and decreases in water availability and runoff, and questioned their scientific basis. Benin, France, Sudan and others preferred keeping them. The agreed text retains the figures estimating 10-40% increases in some areas, and 10-30% decreases in others. Other questions discussed in this context included reference to East and Southeast Asia and other regions, differences between dry and monsoon seasons and inclusion of likelihood statements.

On a statement noting increase in drought-affected areas and flood risk and their negative consequences on sustainable development, WGII agreed to refer only to increased frequency of precipitation events and not to increased intensity. The US called for making clear links between the SPM and the underlying chapters, emphasizing the need for traceability of statements in the SPM.

WGII agreed to remove reference to the implications of increased floods and droughts for sustainable development. Delegates did not agree to proposals to include a new paragraph on sustainable development.

Argentina asked to have it on the record that this SPM section has shortcomings on water pollution.

Ecosystems: On terrestrial carbon sinks, Norway proposed inclusion of nitrous oxide (N₂O) and methane (CH₄). France, supported by the UK and the Russian Federation, underscored that what amplifies climate change is the weakening of carbon sinks, not whether the system is a net source or sink. Text was agreed on weakening carbon uptake and without reference to N₂O or CH₄.

On extinction, the discussion focused on: whether extinction was global or regional, the number, types and representativeness of the species covered by the assessment, and the confidence levels. The Lead Authors indicated that extinction referred to global extinction of plants and animals, and that the studies represented half of the known species. Palau underscored coral reefs. The Russian Federation stressed that the statement would grasp media attention and misleading text must be avoided. Saudi Arabia expressed concern that the statement was not supported by the underlying assessment, and many delegates expressed concern with the confidence levels. On Thursday afternoon, after contact group discussions, text was agreed indicating approximately 20-30% of plant and animal species assessed so far are likely to be at increased risk of extinction if increases in global average temperature exceed 1.5-2.5°C

Food, fibre and forest products: This sub-section was first addressed on Wednesday evening, and agreed early on Friday morning. Discussions focused on crop productivity and fisheries.

On crop productivity, China stressed that there is no productivity decrease in all regions if temperatures increase beyond 3°C. After consulting with the Lead Authors, the text was changed to indicate that a decrease takes place “in some regions.”

Finland proposed adding text on forests and on Thursday afternoon WGII agreed to text prepared by the Lead Authors on modest increases in timber productivity in some regions.

Spain with the US, Saint Lucia and others, requested adding text on fisheries. After consideration of two new drafts prepared by the Lead Authors, WGII agreed to language reflecting the livelihood and food aspects of fisheries.

Coastal systems and low-lying areas: This sub-section was addressed on Wednesday evening and on Thursday. Discussions focused on corals, flooding due to sea-level rise, and adaptation.

On corals, China and Saudi Arabia, opposed by Germany, questioned the scientific basis of the statement on coral bleaching and mortality. The US proposed more generic language. New text on corals was agreed early on Friday morning, referring to more frequent bleaching and widespread mortality.

On flooding due to sea-level rise, delegates debated how to quantify the number of vulnerable people. The US, opposed by New Zealand, Germany, France and others, proposed deleting reference to “millions more people” being affected annually. On Thursday, new text was considered referring to “15 million more people,” with some delegates indicating the figure was too low. The final text was agreed early on Friday morning, making reference to “many millions more people.”

Concerning reference to the world’s mega-deltas, Benin, Saudi Arabia, Egypt and others proposed, and WGII agreed, to mention Africa in text in addition to Asia. Saint Lucia, Cuba and Bahamas opposed deleting reference to small islands, with WGII

agreeing to change the language to indicate special vulnerability of small islands instead of their “highest relative increase in risk.”

On coasts, Norway proposed adding coastal erosion and WGII agreed. The US and Saudi Arabia proposed, and WGII agreed, to delete reference to the time-frame from a sentence indicating that “by mid-century” coasts will be exposed to increasing risks due to climate change and sea-level rise.

On the new paragraph on adaptation, Switzerland and India, opposed by Australia, criticized its introduction and said it should be in Section D. WGII agreed to text indicating that adaptation will be more challenging in developing countries.

Industry, settlement and society: This sub-section was considered on Wednesday. Discussions revolved around likelihood statements and reference to poor communities.

On a statement noting that, in the aggregate, the net effects of climate change will tend to be more negative the larger the change in climate, Switzerland suggested that this is “likely” and proposed the inclusion of a likelihood statement instead of “tend to.” Belgium called for retaining reference to the speed of warming as in a previous version of the paragraph proposing “more strongly negative under larger or more rapid warming.” Neither of these proposals was included.

The UK, opposed by the US, suggested emphasizing the limited adaptation capacity of small holders and subsistence farmers, and the complex, localized impacts that poor communities suffer. The Lead Author explained that the reference could be better made elsewhere. Colombia proposed, and WGII agreed, to remove “relatively” before “high risk areas.”

On a statement on economic and social costs of extreme weather events, the US asked about the basis of the reference to social costs. A Lead Author referred the US to a box on Hurricane Katrina. Austria suggested, and WGII agreed, to insert words from the Technical Summary on how climate change impacts spread from directly impacted areas and sectors to other areas and sectors through complex linkages.

Health: This sub-section was considered on Wednesday, with discussions focusing on reference to industrialized countries and the nature of the evidence.

At the request of New Zealand, bullet points were inserted in a paragraph listing impacts of climate change on health. On a sentence on increased frequency of cardio-respiratory diseases due to higher concentrations of ground-level ozone, China proposed, and WGII agreed, to add language clarifying that the sentence refers to the higher ozone concentrations related to climate change. Libya stressed life expectancy and Mali meningitis, with a Lead Author explaining that the evidence is either indirect or insufficient for inclusion in the report.

Regarding health benefits of climate change in some cold areas, the US, opposed by Germany, suggested referring to industrialized areas instead of temperate areas since the studies refer only to industrialized areas, or else adding some words in relation to limitations in the data. After informal consultations, parties agreed to a suggestion by Ireland to move reference to studies originating mainly in industrialized countries to a footnote. Invoking lack of statistical analysis, Saudi Arabia requested deleting the last part of the paragraph noting that

benefits of climate change are expected to be outweighed by the negative effects of rising temperatures worldwide. WGII did not accept this proposal.

Africa: This sub-section was considered on Wednesday night and Thursday. Discussions focused on projections on water shortages, and agriculture and food insecurity.

On water shortages, Zimbabwe, supported by Sudan and Egypt, suggested removing language on “complex water governance.” The Gambia, supported by the UK, Belgium, US and others, called for quantifications. On Thursday, delegates agreed to new text drafted by the Lead Authors indicating that by 2020, between 75 and 250 million people are projected to be exposed to an increase of water stress.

On agriculture, yield and food insecurity, Egypt and Niger proposed, and WGII agreed, to add reference to semi-arid areas. Language proposed by Sudan and US on projections concerning agricultural and food production was included.

On local food supplies and fisheries, Egypt highlighted over-fishing in coastal zones, and not only in lakes. Libya requested changing language on “decreasing fish catches,” with the Lead Authors proposing, and WGII agreeing, “decreasing fisheries resources.”

On low-lying coastal areas, Ghana proposed and WGII agreed to add language on the cost of adaptation amounting to at least 5-10% of gross domestic product (GDP). On Thursday evening, a new paragraph was also agreed on adaptation, highlighting multiple stresses and low adaptive capacity. Early on Friday morning, text was introduced on new studies on Africa being one of the most vulnerable continents, with Sudan opposing it and China proposing new language. WGII agreed to include the text.

Asia: This sub-section was considered on Wednesday and Thursday. Discussions focused on glacier melt, coastal areas, flooding, impacts on development and food scarcity.

On glacier melt in the Himalayas, India opposed wording on glacier disappearance, proposing to use “recede.” The US pointed at a seeming inconsistency regarding disappearance of glaciers by 2030 in the underlying report. Saudi Arabia questioned the confidence level of glacier melting. India said the confidence level should be medium. After informal consultations, WGII agreed to language “recede” and removed mention of confidence levels.

On coastal areas India proposed, and WGII agreed to, language clarifying the distinction between sea-level rise related flooding and river flooding.

China proposed deletion of a paragraph on impacts of climate change on development. India said a paragraph on water scarcity would be more appropriate. A reworded paragraph was agreed in plenary on Thursday afternoon, noting that climate change is projected to “impinge on sustainable development.”

On increase of risk of food scarcity, the US noted that some areas will experience an increase in crop productivity, while in others it will decrease. The US also said text was needed noting the socioeconomic effects in the relationships between food productivity and hunger. WGII agreed to add language on the influence of “rapid population growth and urbanization” on the risk of hunger.

Australia and New Zealand: This section was considered late on Wednesday night without much discussion.

On loss of biodiversity, delegates agreed to state loss was “significant” and specified the timeframe.

On production from agriculture and forestry, WGII agreed to proposals by Australia on more specific timeframes and by New Zealand on changing “benefits” to “initial benefits.”

Europe: The section on Europe was discussed late on Wednesday night and on Thursday. Discussions focused on documentation of impacts and regional questions.

On the documentation of wide ranging impacts of climate changes “for the first time,” the US, China and Saudi Arabia questioned the basis of this statement. The Lead Authors, the UK, Germany, Italy, Chile, Norway and others stressed the underlying science and the importance of conveying the information on documented impacts to policy-makers. The US, opposed by the UK, requested removing reference to “anthropogenic” climate change, which was replaced by Co-Chair Parry’s proposed language on “future” climate change.

On Thursday morning and afternoon, WGII agreed to statements concerning impacts in different European regions, modified based on comments mostly from the relevant countries. On Southern Europe, language was added including on impacts on summer tourism, and on Central and Eastern Europe, modifications were made concerning the decrease of forest productivity and increase in peatland fires.

Latin America: This section was considered on Thursday morning. Discussions focused on early warning systems, inclusion of specific examples and a reference to El Niño.

WGII agreed to Ghana and Colombia’s proposal to delete reference to El Niño, and to add a paragraph on water availability.

On a paragraph on adaptation, discussions focused, *inter alia*, on including reference to early warning systems. The agreed text has language noting that some countries have made efforts to adapt, including early warning systems.

The rest of the text was agreed with minor changes to remove specific examples, such as country names and specific crops including maize, wheat and sugar.

North America: This section was considered on Thursday, with discussions focusing on its overall structure and specific questions about coastal areas, agriculture and extremes.

France, opposed by the US, proposed restructuring the entire section and adding detail from the Executive Summary, including on hurricanes. The Lead Authors suggested, and France endorsed, a new sentence on North America “experiencing locally severe economic damage, plus substantial ecosystem, social and cultural disruption,” with the US opposing and requesting to examine its basis. Agreement on inclusion of this text was not reached.

The US proposed adding a statement on the benefits of moderate climate change for agriculture. After informal consultations, a sentence was added on an increase in crop-yields in the early decades as a consequence of moderate climate change.

On coastal communities, Canada identified the need to be more specific than the US proposal and France emphasized hurricanes. The text was bracketed on Thursday morning. In the

afternoon, the Lead Authors provided and the WGII approved new text, mentioning, *inter alia*, the impacts of tropical storm increases.

Polar Regions: This section was considered on Thursday morning. Discussions focused on language concerning “negative and positive impacts” of climate change on Arctic human communities, with Norway proposing finding an alternative expression. Saudi Arabia highlighted benefits and opposed Belgium’s proposal on “mixed impacts.” The final text was agreed on Friday with language that impacts are “projected to be mixed” and incorporated Canada’s proposed reference to Arctic communities.

On beneficial impacts, Canada also proposed, and WGII agreed, to delete reference to increasing agricultural and forestry yields as it relates to the distant future.

On biophysical effects, WGII agreed to Norway’s proposal to add reference to increased coastal erosion.

Small Islands: The section on small islands was discussed on Thursday afternoon and was adopted without major debate.

Mauritius proposed inserting reference to tropical cyclones and health impacts, with delegates agreeing to add a sentence identifying special vulnerability to climate change, sea-level rise and extreme events.

On sea-level rise, Cuba underscored its importance and delegates agreed to Saint Lucia’s proposal to mention threats to settlements and facilities in addition to vital infrastructure.

On water resources, data gaps were identified concerning islands of the Indian Ocean.

After the sub-sections on sectors, systems and regions, there are a number of paragraphs.

On more systematic understanding of **magnitudes of impact**, the US, supported by Saudi Arabia, and opposed by the Russian Federation, Belgium, Austria, the UK and others, called for deleting a sentence explaining that assessment of potential key vulnerabilities is meant “to provide guidance to decision makers, for example, for identifying levels and rates of climate change that, in the terminology of the UNFCCC Article 2, could result from ‘dangerous anthropogenic interference’ with the climate system.” Several formulations were proposed by the US and Co-Chair Parry trying to avoid the reference to anthropogenic interference and to UNFCCC Article 2. A Lead Author, supported by the Russian Federation and others, and opposed by the US and Saudi Arabia, quoted the mandate of WGII to specifically address UNFCCC Article 2. Given lack of consensus on the reference, delegates agreed to a proposal by the UK stating “to help decision makers make appropriate responses to the risks of climate change.” Reference to the UNFCCC was removed.

On **systems, sectors and regions especially affected** by climate change, the US, supported by Saudi Arabia, and opposed by Austria, Argentina, South Africa, Switzerland and others, proposed to remove the entire section listing systems, sectors and regions likely to be specially affected by climate change saying that they are all included elsewhere. Argentina called for adding reference to wetlands, and South Africa proposed adding semi-arid ecosystems. The US said that she had no problem with the substance but that given that it is captured in other sections

and the lack of time for discussion, called for deleting the whole section. Germany, France, Canada, Sudan, Austria, South Africa, Japan, Switzerland and others opposed deletion, with France expressing concern with the proceedings and the removal of text at the request of a single delegation or two. The section was nonetheless removed.

On **large-scale climate events**, on a paragraph on the Meridional Overturning Circulation (MOC), France noted that the inclusion of impacts on terrestrial vegetation in the 21st century as a result of large scale and persistent changes in the MOC could be confusing and proposed deleting it. Belgium, with the UK, questioned the need to refer to the possibility of net cooling occurring after the 21st century in some locations given that WGI did not mention it, and, opposed by Saudi Arabia and the Russian Federation, proposed removing the reference. WGII agreed.

Final Text: The final text explains that Section C focuses on key findings concerning projected impacts in each system, sector and region “for the range of (unmitigated) climate change projected by the IPCC over this century.” The section also contains some findings on vulnerability and adaptation.

The final text points to the availability of more specific information, including on fields not covered in previous assessments. It contains statements and examples on: freshwater resources and their management; ecosystems; food, fibre and forest products; coastal systems and low-lying areas; industry, settlement and society; and health.

The text also explains that more specific information is now available across the regions of the world, including places not covered in previous assessments. It contains statements and examples on Africa, Asia, Australia and New Zealand, Europe, Latin America, North America, Polar Regions and Small Islands.

The SPM indicates that magnitudes of impact can now be estimated more systematically for a range of possible increases in global average temperature, highlighting progress since the TAR. It states that some large-scale climate events have the potential to cause very large impacts, especially after the 21st century.

D – CURRENT KNOWLEDGE ABOUT RESPONDING TO CLIMATE CHANGE: Consideration of Section D did not begin until 10:00 pm on Thursday evening. For approximately two hours delegates focused on global mean losses of GDP and whether reference should be made to the Stern Review on the Economics of Climate Change (Stern Review). Close to midnight, IPCC Chair Pachauri stressed the importance of making progress, with WGII Co-Chair Parry indicating that the SPM might not be finalized.

Discussions on Section D were initiated starting from the last paragraphs rather than from the beginning. They focused on global mean GDP losses, social cost of carbon, benefits and costs, sustainable development and mitigation.

On GDP losses, the US requested to specify the range by replacing “up to 5%” for 4°C of warming with “1-5%”. Austria, Germany, France and others supported adding reference to the Stern Review, which estimates GDP losses “at or above 10%.” The US, Saudi Arabia and China opposed. The US questioned why a non-peer reviewed study should be included, while UK, France, Germany, the European Community (EC) and others stressed that the high-profile Stern Review had already been

presented at UNFCCC COP12, and ignoring it would seem “weird.” With the US and Saudi Arabia contesting Co-Chair Parry’s proposed information from the Stern Review, the section was bracketed with opposition from Austria, the EC and others. Austria, opposed by Saudi Arabia, proposed discussing the text in a small group. The text on GDP was bracketed without small-group discussion. The final SPM refers to GDP losses between 1-5% without mentioning the numbers from the Stern Review.

Concerning social cost of carbon, ranges were added at the request of China. The UK proposed also addressing figures from the Stern Review estimating the social cost of carbon at US\$85 per tonne, while Saudi Arabia indicated they would not discuss the text or the Stern Review in the plenary or a small group. Brazil opposed reference to the Stern Review as it would be a precedent on the use of non-peer reviewed material by the IPCC. Argentina urged moving to issues important for developing countries.

On benefits and costs of climate change, the US suggested changing the range of temperature increase from “less than 2°C” to 1-3°C. Austria asked where benefits would occur above 3°C, and text on costs and benefits was modified to reflect US and Austria’s concerns.

On the relationship between sustainable development and climate change, the US questioned a likelihood statement on climate change impeding achievement of the Millennium Development Goals (MDGs). A Lead Author noted the existence of some projections. Co-Chair Parry proposed, and WGII agreed to, wording noting that climate change “could impede achievement of the MDGs.”

Saudi Arabia questioned the basis for the statement that climate change can slow the pace of sustainable development. Co-Chair Parry, opposed by the UK, Germany and Japan, proposed deleting the statement since it appears elsewhere. WGII agreed to language stating that climate change “could impede nations’ abilities to achieve sustainable development pathways.”

On a chapeau paragraph stating that many impacts can be reduced or delayed with mitigation, the UK suggested replacing mitigation “particularly over the mid- and long-term” with “timely and appropriate mitigation.” The US preferred dropping the reference to time and noting that “many impacts can be reduced by mitigation.” Parties agreed to note that “many impacts can be avoided, reduced, or delayed by mitigation.”

Citing uncertainties and lack of value added, China, with Brazil and Saudi Arabia, and opposed by Germany, the UK and others, called for removing a paragraph noting an increase of information allowing calculation of the amount of mitigation needed to avoid impacts. Germany expressed concern about the deletion of references to mitigation throughout the text, and Co-Chair Parry suggested alternative wording to avoid the word “mitigation.” Stressing the scientific nature of the SPM, Japan, UK and others opposed alternative formulations. Australia noted similar text elsewhere. WGII agreed to remove the paragraph.

On adaptation and mitigation being complementary, the UK also suggested changing text to avoid the impression that there would not be benefits from mitigation for 60 years. WGII agreed, *inter alia*, to indicate that even the most stringent mitigation efforts cannot avoid further impacts of climate change in the next few decades.

On increasing adaptive capacity through climate impact assessment, South Africa, proposed omitting the words “mainstreaming” and “integrating.” Supported by Brazil, she highlighted “mainstreaming” as a particular policy approach. Switzerland opposed the deletion, referring to the Organization for Economic Cooperation and Development’s (OECD) approach to official development assistance that emphasizes “integration” and “mainstreaming”. Austria stressed that this was an IPCC session rather than a UNFCCC negotiation. Delegates agreed to modify the text and omit “integration” and “mainstreaming.” On the list of related examples, Argentina proposed replacing “droughts” with “hydrometeorological” and Switzerland suggested reference to the framework agreed to at the World Conference on Disaster Reduction in 2005. These proposals were not incorporated, but the examples on increasing adaptive capacity were simplified based on suggestions from the US.

Text on past emissions was considered early on Friday morning. China proposed language referring to past emissions since 1750, but WGII approved language on unavoidable warming even if greenhouse gas concentrations remain at 2000 levels.

Co-Chair Parry indicated that a table on examples of current and potential options for adaptation had originally been included at the request of the US. Citing lack of time, Germany proposed addressing the table later. Co-Chair Parry, opposed by Chile, proposed removing the table and WGII agreed.

On text noting the importance of availability of resources for developing countries, Argentina underscored capacity building.

On a paragraph noting that adaptation alone is not projected to cope with projected climate change effects and mitigation will be required, China and Saudi Arabia, opposed by Germany, Austria, Tuvalu, and others, proposed deleting the paragraph. Japan, the UK and others stressed the importance of keeping the mitigation sentence. The US said it could agree to the mitigation sentence, but expressed concern on the combination of the two sentences. WGII agreed to maintain the paragraph but remove the sentence on mitigation.

On a sentence on integration of adaptation and other measures, WGII agreed to Switzerland’s suggestion to change “disaster planning” to “risk reduction strategies.”

Final Text: The final text on Section D on responding to climate change finds that some adaptation to observed and projected future climate change is occurring now, but on a limited basis. It indicates that adaptation will be necessary to address impacts of already unavoidable warming, identifies the availability of a wide array of adaptation options and stresses that more extensive adaptation is required than is currently occurring. It states that barriers, limits and costs exist but are not fully understood.

The text indicates that vulnerability to climate change can be exacerbated by the presence of other stresses, and that future vulnerability depends not only on climate change but also on development pathways. It explains that sustainable development can reduce vulnerability to climate change, and that climate change could impede nations’ abilities to achieve sustainable development pathways.

The text states that many impacts can be avoided, reduced or delayed by mitigation and that a portfolio of adaptation and mitigation measures can diminish the risks associated with climate change. It clarifies that impacts of climate change will vary regionally but are very likely to impose net annual costs, increasing over time with temperature rise.

E – SYSTEMATIC OBSERVING AND RESEARCH NEEDS: This section was briefly considered after 1:00 am on Friday. WGII agreed to a new text proposed by IPCC Chair Pachauri, which underscored the importance of research and recommendations proposed in the underlying report. This text replaced a previous text that identified needs in bullet points. Sudan requested to include its disagreement in a footnote.

Final Text: The final text of this short section on systematic observing and research needs indicates that although information has improved, WGII advice for further observation and research should be considered seriously.

FIGURES AND TABLES: Figures and tables were discussed throughout the meeting, in plenary, in contact groups and informally.

Table on key impacts on sectors and systems (Table SPM-1): A table containing information on key impacts, on sectors and systems was initially discussed in plenary on Monday evening, and subsequently in a contact group, co-chaired by Australia and Ghana. The contact group met five times and at least eight different drafts and revisions of the sectors table were circulated during discussions. The table was agreed on Friday morning,

The table expressed impacts as a function of increasing global average temperature, and contained three boxes: 1) key impacts expressed by sectors and systems; 2) best estimates and likely ranges of global average temperature increases for years 2020, 2050 and 2080 under the IPCC Special Report on Emission Scenarios (SRES) scenarios; and 3) the average and a range of global temperature increases for years 2020, 2050 and 2080 under stabilization scenarios from the TAR Synthesis Report. The three boxes shared the same horizontal axis, showing temperature increases from 1-5°C relative to 1980-1999. The sectors and systems box included sub-boxes on the following sectors and systems: water, ecosystems, food, coasts, health and singular events.

The discussion on the sectors table focused on, *inter alia*: confidence levels; the use of quantitative vs. qualitative information; traceability; whether to include SRES and stabilization scenarios; presentation issues; and particular entries.

On Monday in plenary, Co-Chair Parry and a Lead Author presented the table, noting changes from the previous version that had been circulated among governments, including: addition of color; removal from the table of sources and confidence levels to increase clarity; and addition and removal of a few entries. They said that the number of globally relevant estimates is very small. They also explained why SRES scenarios and TAR stabilization scenarios had been used and the advantages and disadvantages of such an approach. Responding to the presentation, the Russian Federation said this was not a scientific seminar.

On the temperature scale, New Zealand, Switzerland and others voiced concern about the top range of the table at 5°C, with Co-Chair Parry explaining that there are not many

estimations above 5°C. Germany said temperature scale should be relative to pre-industrial levels, rather than the proposed 1980-1999 period.

On SRES and stabilization scenarios, France, Germany, Austria, Spain, Norway and others called for taking into account the speed of warming and adding information on pre-industrial levels. Germany, the UK, Belgium and others also supported including information of where stabilization actually occurs. Ghana noted that readers could infer a non-intended relationship between SRES projections and stabilization levels. Saudi Arabia opposed inclusion of scenarios. China said inclusion of stabilization scenarios did not reflect the underlying text. New Zealand, the US, Brazil expressed concern about including the stabilization scenarios.

On content of sub-boxes, Switzerland proposed introduction of impacts on fisheries, forestry and glaciers. China called for including adaptation to impacts whenever possible. The UK, Spain and Germany supported including information on sea-level rise. Austria, the UK, Germany, South Africa, New Zealand and others, opposed by India and Saudi Arabia, called for incorporating quantitative information. Italy and Spain said the items should be consistent with the text. Switzerland proposed using the same indicators for most regions, and a Lead Author explained that each regional group had been left to decide which indicators were more important to each region. Switzerland, Germany, Italy and Sweden expressed concern on specific entries. Following a question by Canada, a Lead Author explained that the table expresses only the net impacts of climate change. India questioned the mention of specific country names.

In a subsequent draft presented on Thursday, some quantitative information was removed. Germany, UK and Norway underscored the importance of quantification. Austria noted that quantitative information had been withheld from the SPM text because it was included in the table, but if removed from the table, it would be found nowhere in the SPM. The US said the issue is not the robustness of the information, but the way the information is conveyed, which has to stand up to broad scrutiny from all angles. The US highlighted adaptive capacity. China expressed concern about forceful modification of figures in the table.

On visual aspects, delegates asked for, *inter alia*: removing colors, adding colors, changing colors, removing arrows, adding arrows, extending arrows, using solid boxes for the text, moving the stabilization scenarios box under the sectors box, using transparent paper, and different font sizes and colors.

On traceability, many delegates noted the need for traceability of the information included in the table. The issue was resolved introducing a column to the left of entries with references to the assessment chapters.

On the confidence levels, the US, Saudi Arabia, China and India proposed including only high confidence terms. South Africa stressed the importance of also having statements of medium confidence given their relation to risk. Germany, Finland, New Zealand, Spain and others defended keeping medium-confidence events. A Lead Author said that high-impact medium-confidence events were included because the guidelines

included risk management, and risk, he noted, is probability times impact. The US said the table language should stand the test of time.

Early Friday morning, the plenary considered the tables again. WGII agreed to the Russian Federation's proposal to change "major" to "significant" when referring to species extinctions at temperature increases above 4°C. A footnote in the table defines significant as over 40%. The US said he would like the singular events sub-box in the AR4 Synthesis Report instead of the SPM. WGII agreed to France's proposal to remove the singular events box and move a statement on ecosystem changes due to weakening of the Meridional Overturning Circulation to the ecosystems box. WGII agreed to the box on sector and system impacts with those changes.

Saudi Arabia, China, the Russian Federation and Libya opposed inclusion of SRES scenarios, but many others supported their inclusion. A Lead Author said that not including SRES and stabilization scenarios was violating IPCC decisions after TAR to have greater interaction between working groups. Co-Chair Parry referred to the rules of procedure and the SRES box was removed from the table. The box on stabilization scenarios was also removed.

Final Table: The final table highlights key impacts on the water, ecosystem, food, coast and health sectors/systems, including: hundred of millions of people being exposed to increased water stress; increased coral bleaching, increased damage from floods and storms, and increased mortality from heat waves.

Table on key impacts on regions: A table containing information on key impacts on regions was initially discussed in plenary on Monday evening, together with draft table SPM-1. The draft table expressed impacts as a function of increasing global average temperature, and its structure was parallel to that of Table SPM-1, with three boxes: one on impacts including sub-boxes for regions; and the other two identical to the proposed SRES and stabilization scenarios boxes in draft table SPM-1.

In plenary, Saudi Arabia noted the existence of many caveats to the table.

The discussion began in the contact group on Thursday after 8:00 pm, and focused on Africa for two hours. Saudi Arabia, US, Brazil and others, opposed by Italy and France, noted lack of time to continue consideration of the regional table. In plenary on Friday morning, WGII agreed to remove the table from the SPM.

"Burning embers" diagram: A diagram on causes of concern, similar to the one included in the TAR Synthesis Report was first introduced during the Wednesday morning contact group on impact tables, following requests in plenary by Germany, Austria and Spain. Switzerland said the diagram was too vague. Italy supported its inclusion noting that it is a TAR figure familiar to policymaker. The US requested time to consider the diagram and proposed its inclusion in the AR4 Synthesis Report instead. Spain noted the different audiences of the Synthesis Report and SPM and advocated keeping the diagram in the SPM. On Thursday WGII agreed not to include the diagram.

Extreme weather events impact table (Table SPM-2):

Delegates made editorial and other minor changes to a table noting possible impacts of climate change due to extreme weather events, including amendments to ensure consistency with WGI and clarifications of language used. France, with Libya, and opposed by Saudi Arabia, called for removing a reference suggesting increased use of air conditioning as a possible adaptive measure for heat waves and warm spells. Early on Friday morning WGII agreed to change “without air conditioning” to “without appropriate housing and/or cooling.”

Final Table: The final table includes two columns from figure SPM-2 of WGI’s contribution to AR4, and four columns with the examples of major projected impacts in: agriculture, forestry and ecosystems; water resources; human health; and industry/settlement/society.

Figure on observed changes (Figure SPM-1): A figure on changes in physical and biological systems and surface temperature was first addressed in plenary on Monday. Several delegates commented on the lack of clarity regarding whether areas colored in white represented lack of data or lack of temperature changes. Many stressed the need to increase readability and a contact group, co-chaired by Belgium and Sudan, was established. In contact group discussions, the Lead Authors explained the figures in the SPM-1, and presented a revised map, which showed improved data coverage for the Russian Federation. Corrections were made to data on Europe, and an explanation of the data-selection process was inserted in a caption. Delegates agreed to the revised figure.

Final Figure: The final figure depicts a world map noting significant observed changes in physical and biological systems, as well as observed temperature changes for the 1970-2004 period. The figure also contains boxes showing the regional distribution of the significant observed changes, as well as the percentage of those changes consistent with a warming trend.

CLOSING PLENARY

On Friday afternoon, IPCC Secretary Christ introduced the revised SPM and a document listing changes in the Technical Summary and underlying chapters. Co-Chair Parry assured delegates that the document would be thoroughly proofread. WGII approved the SPM (WG-II:8th/Doc. 2a Rev.1).

On Friday afternoon, WGII also accepted the Technical Summary and underlying scientific/technical assessment with a list of changes to be made (WG-II:8th/Doc. 2b and WG-II:8th/Doc. 3).

Noting the WGII finding on big gaps of data on small islands, Tuvalu appealed for assistance on enhancing systematic observation and data collection on small islands to allow for an improved Fifth Assessment Report.

Co-Chair Parry stressed the importance of “buy-in” by governments and said that, although the process might be difficult, the payoff is high. He drew the meeting to a close at 1:46 pm on Friday, 19 hours after originally scheduled.

UPCOMING MEETINGS

UNFCCC ASIAN REGIONAL WORKSHOP ON ADAPTATION: Organized by the UNFCCC secretariat in accordance with UNFCCC COP Decision 1/CP.10 (Buenos Aires Programme of Work on Adaptation and Response Measures), this meeting will take place in Beijing, China, from 11-13 April 2007. For more information, contact: Youssef Nassef, UNFCCC Secretariat; tel: +49-228 815-1000; fax: +49-228 815-1999; e-mail: ynassef@unfccc.int; internet: http://unfccc.int/adaptation/adverse_effects_and_response_measures_art_48/items/3932.php

NINTH SESSION OF IPCC WORKING GROUP III AND TWENTY-SIXTH SESSION OF IPCC-26: IPCC-26 is scheduled for 4 May 2007, in Bangkok, Thailand, immediately following the ninth session of IPCC Working Group III, to be held from 30 April - 3 May 2007. For more information, contact: IPCC Secretariat; tel: +41-22-730-8208; fax: +41-22-7 30-8025; e-mail: IPCC-Sec@wmo.int; internet: <http://www.ipcc.ch/>

GLOSSARY

AR4	IPCC Fourth Assessment Report
COP	Conference of the Parties
EU ETS	European Union Emissions Trading Scheme
IPCC	Intergovernmental Panel on Climate Change
MOC	Meridional Overturning Circulation
MDGs	Millennium Development Goals
OECD	Organization for Economic Cooperation and Development
SPM	Summary for Policymakers
SRES	IPCC Special Report on Emission Scenarios
Stern Review	Stern Review on the Economics of Climate Change
SYR	AR4 Synthesis Report
TAR	IPCC Third Assessment Report
UNFCCC	United Nations Framework Convention on Climate Change
UNEP	United Nations Environment Programme
WMO	World Meteorological Organization
WGI	IPCC Working Group I
WGII	IPCC Working Group II
WGIII	IPCC Working Group III