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# New features in IPCC AR5 SBSTA Research Dialogue

Bonn, 8 June 2011

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Secretary of the IPCC

# Uncertainties and risks

*Risk is function of probability and consequence*

- Full range of consequences / probabilities
- Tails also important – high impact events
- If outcome conditional evaluate all causes and effects, reconcile multiple evidence
- Framing has effect on how message is perceived – reciprocal statements
- If statements too general - meaningless

# Confidence in validity of a finding

expressed **qualitatively** (5 qualifiers) based on type, amount, quality and consistency of **evidence**, and degree of **agreement**

Agreement ↑	<i>High agreement Limited evidence</i>	<i>High agreement Medium evidence</i>	<i>High agreement Robust evidence</i>
	<i>Medium agreement Limited evidence</i>	<i>Medium agreement Medium evidence</i>	<i>Medium agreement Robust evidence</i>
	<i>Low agreement Limited evidence</i>	<i>Low agreement Medium evidence</i>	<i>Low agreement Robust evidence</i>
	Evidence (type, amount, quality, consistency) →		

Confidence Scale

# Likelihood

## Quantified measures of uncertainty

Expressed  
**probabilistically**  
based on  
statistical analysis  
of observations,  
model results or  
expert judgment

Term*	Likelihood of the Outcome
<i>Virtually certain</i>	99-100% probability
<i>Very likely</i>	90-100% probability
<i>Likely</i>	66-100% probability
<i>About as likely as not</i>	33 to 66% probability
<i>Unlikely</i>	0-33% probability
<i>Very unlikely</i>	0-10% probability
<i>Exceptionally unlikely</i>	0-1% probability

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# Detection and attribution

## IPCC Fourth Assessment Report (AR4)

- Difficulties remain in reliably simulating and attributing observed temperature changes at smaller scales
- Anthropogenic warming over the last three decades has likely had a discernible influence at the global scale on observed changes in many physical and biological systems

## IPCC Fifth Assessment Report (AR5)

- Coverage from global to regional, implications for projections
- Atmospheric and surface changes, changes in ocean properties, cryosphere, and extreme events
- Emphasis on impact-relevant changes in the climate system and impacts in natural and human systems.

# Detection and Attribution related to Anthropogenic Climate Change

*Expert meeting, Geneva, September 2009*

- Clarification of methods, definitions and terminology across WG I and II
- Guidelines for how to assess quality of studies
- Recommendations for good practice in detection and attribution studies
- Data requirements
- Criteria for assessing confidence
- Methods for handling confounding factors

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# Some new WG I features

- Clouds and Aerosols
- Near-term Climate Change: Projections and Predictability
- Long-term Climate Change: Projections, Commitments and Irreversibility
- End to end assessment of Sea Level Change – Kuala Lumpur Workshop

# Carbon and Other Biogeochemical Cycles (CCT)

- Past changes, recent trends and projections
- Processes and understanding of changes, including ocean acidification
- Interactions between the carbon and other biogeochemical cycles, including nitrogen cycle
- Carbon cycle – climate feedbacks and irreversibility
- Geo-engineering involving the carbon cycle



# Ocean acidification

*Workshop, January 2011, Okinawa, Japan*

The changing chemistry of the oceans

- Paleo, pre-industrial, current trends, future

Impacts of Ocean Acidification

- Calcification and dissolution of reef organisms
- Phytoplankton calcification and photosynthesis
- Non coral reef invertebrates, fish,
- Microbial processes and biochemistry

Scaling up from experiments to ecosystems

Spatial and temporal scales, vulnerable regions

Socioeconomic impacts and multiple stresses

# Geo-engineering

## *Expert Meeting (June 2011, Lima)*

- Major uncertainties regarding effects on physical climate system, biogeochemical cycles, possible impacts on human and natural systems, effectiveness and costs as well as long term commitment
- **Comprehensive risk assessment is lacking**
- Understanding of physical science basis (WG I)
- Impacts on human and natural systems (WG II)
- Role within portfolio of response options, possible impacts and side effects and options for appropriate governance mechanisms (WG III)
- Current state of science and current activities
- Geoengineering options incl. solar radiation management and
- carbon dioxide removal
- Cross-cutting Issues: risk, time scales and governance

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# New elements in WG II and III

- Risk management and framing
- Multiple stress framing
- Iterative approach to assess climate protection goals: concepts, costs, technology portfolio, SD
- Expanded treatment of adaptation
- Integrated assessment of investment and finance issues
- Human well being, security, ethical concepts

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# Economic Analysis, Costing Methods, and Ethics

*Expert Meeting, Lima, Peru, June 2011*

- Cross-cutting issues in economic analysis, costing methods, and ethics
- Valuation
- Decision making under uncertainty
- Distributional ethics and equity

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# Infrastructure & Human Settlements

*Workshop, Kolkata, India, March 2011*

## Spatial Planning & Land-Use Change

- impacts, adaptation, mitigation

## Urban planning and settlement forms

- Health, poverty alleviation, water, sanitation
- Waste management, “green cities”

## Region – city interface

## Transport and energy infrastructure

## Built environment

- Planning, managing, retrofiting

## Policies, governance, incl. disaster preparedness

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# Better regional analysis

- Climate phenomena such as Monsoon, ElNino and their relevance for future regional climate change
- Atlas of global and regional climate projections
- WG 2 – Part B regional aspects
- Chapters on oceans in WG I and II