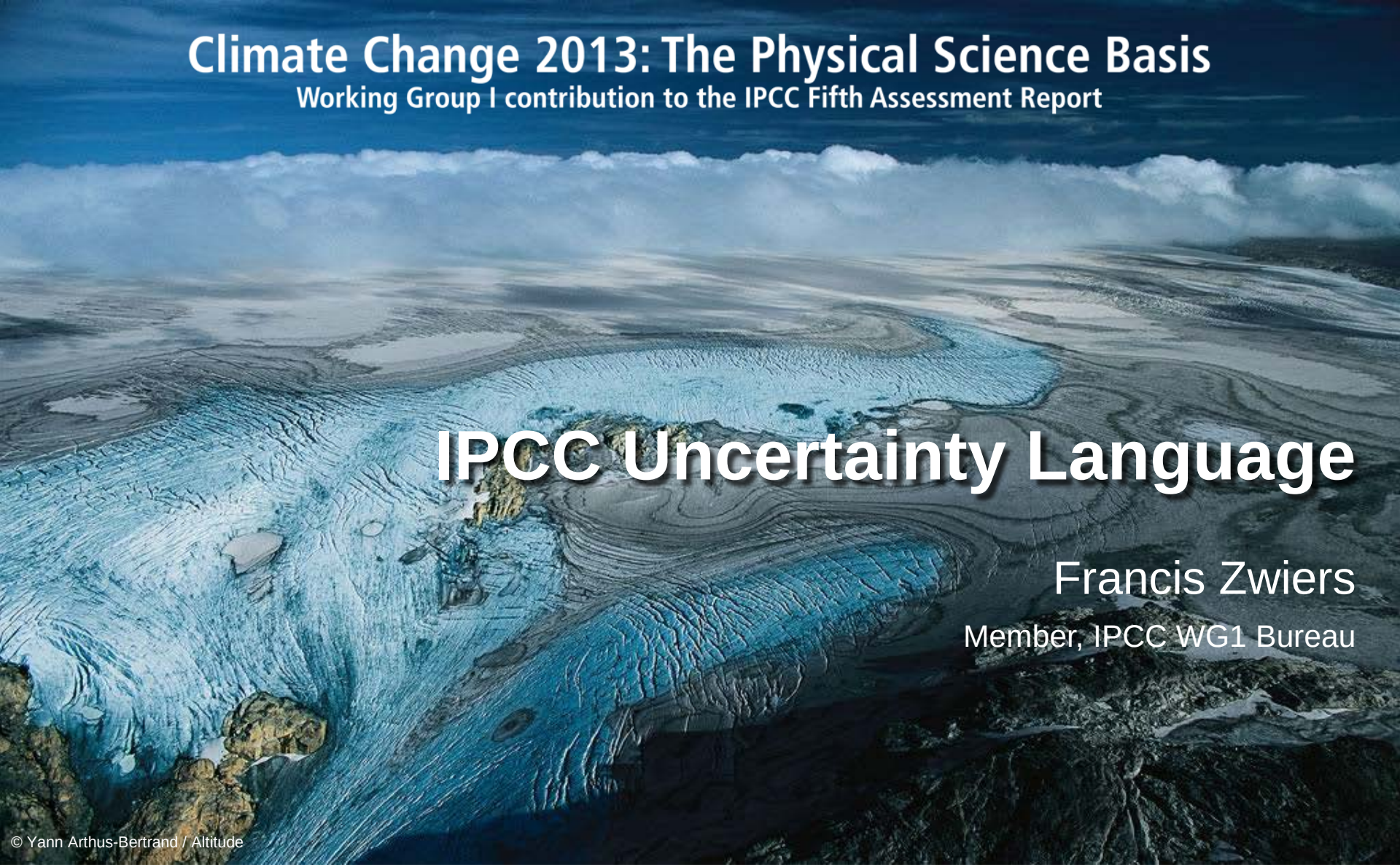


IPCC Uncertainty Language

Francis Zwiers

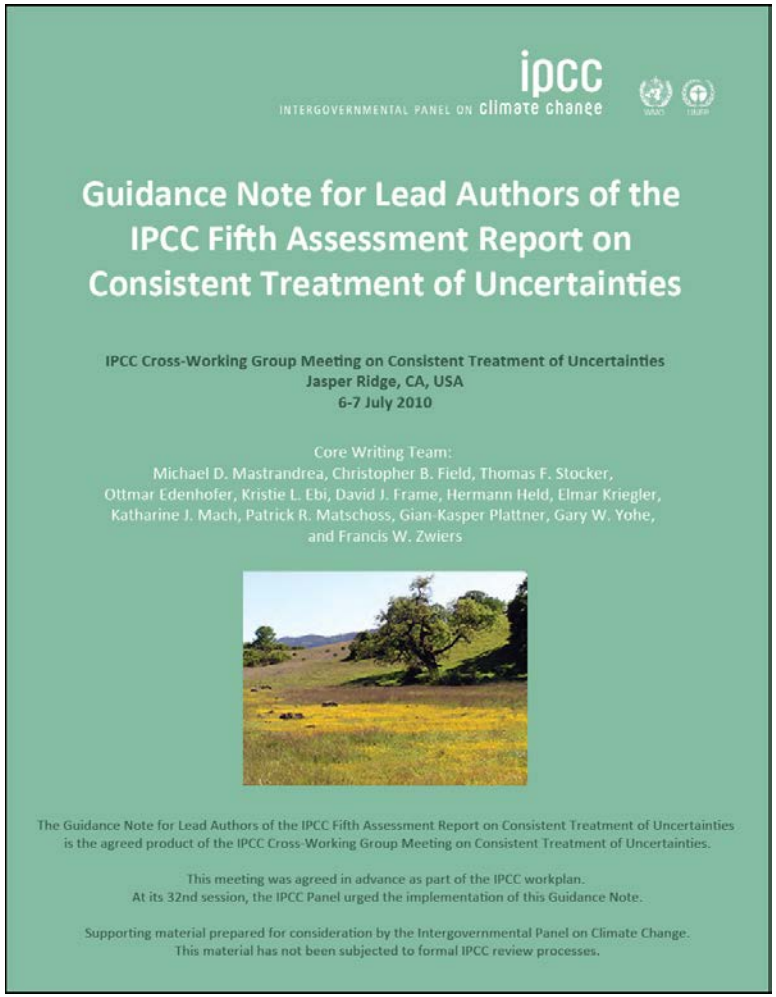
Member, IPCC WG1 Bureau

Outline

- Background
- AR5 assessment approach and uncertainty terms
- Examples

Calibrated uncertainty language

- Has been used since 1998
- An integrated approach was developed in 2010
- Its use was endorsed by Plenary at IPCC-33 (10-13 May 2011, Abu Dhabi)



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INTERGOVERNMENTAL PANEL ON climate change

Guidance Note for Lead Authors of the IPCC Fifth Assessment Report on Consistent Treatment of Uncertainties

IPCC Cross-Working Group Meeting on Consistent Treatment of Uncertainties
Jasper Ridge, CA, USA
6-7 July 2010

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The Guidance Note for Lead Authors of the IPCC Fifth Assessment Report on Consistent Treatment of Uncertainties is the agreed product of the IPCC Cross-Working Group Meeting on Consistent Treatment of Uncertainties.

This meeting was agreed in advance as part of the IPCC workplan.
At its 32nd session, the IPCC Panel urged the implementation of this Guidance Note.

Supporting material prepared for consideration by the Intergovernmental Panel on Climate Change.
This material has not been subjected to formal IPCC review processes.

AR5
Integrated Uncertainty Language

Assessment process

1. Evaluate **evidence and agreement**
2. Synthesize finding and assess **confidence** (qualitative judgment)
3. Quantify uncertainty with a **likelihood** assessment when necessary and where possible (requires sufficient confidence; uncertainty is not always quantifiable).

In most cases, all steps are not explicitly reported

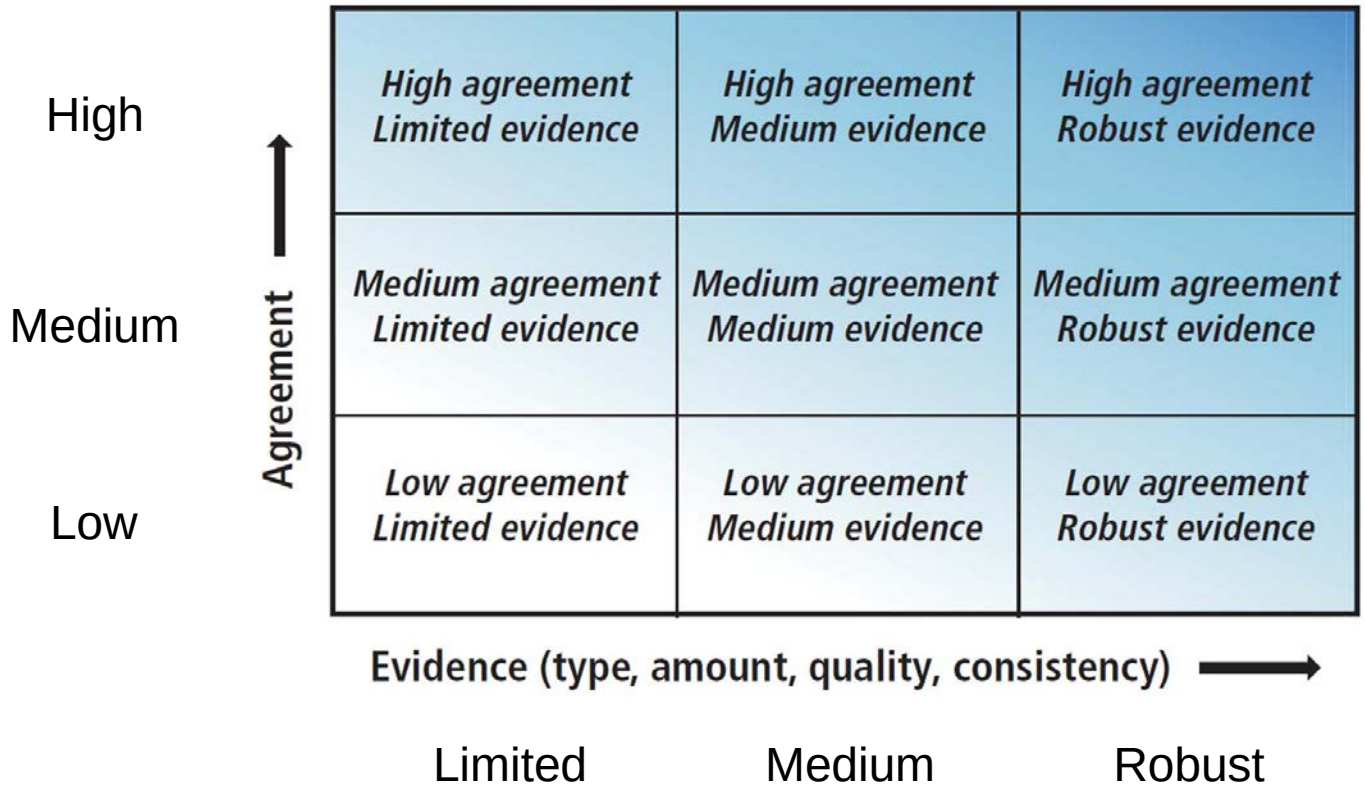
Some assessments are statements of fact

e.g., "Each of the last three decades has been warmer than all preceding decades since 1850"

FD, 7 June 2013, page SPM-3, line 3

Evidence and Agreement

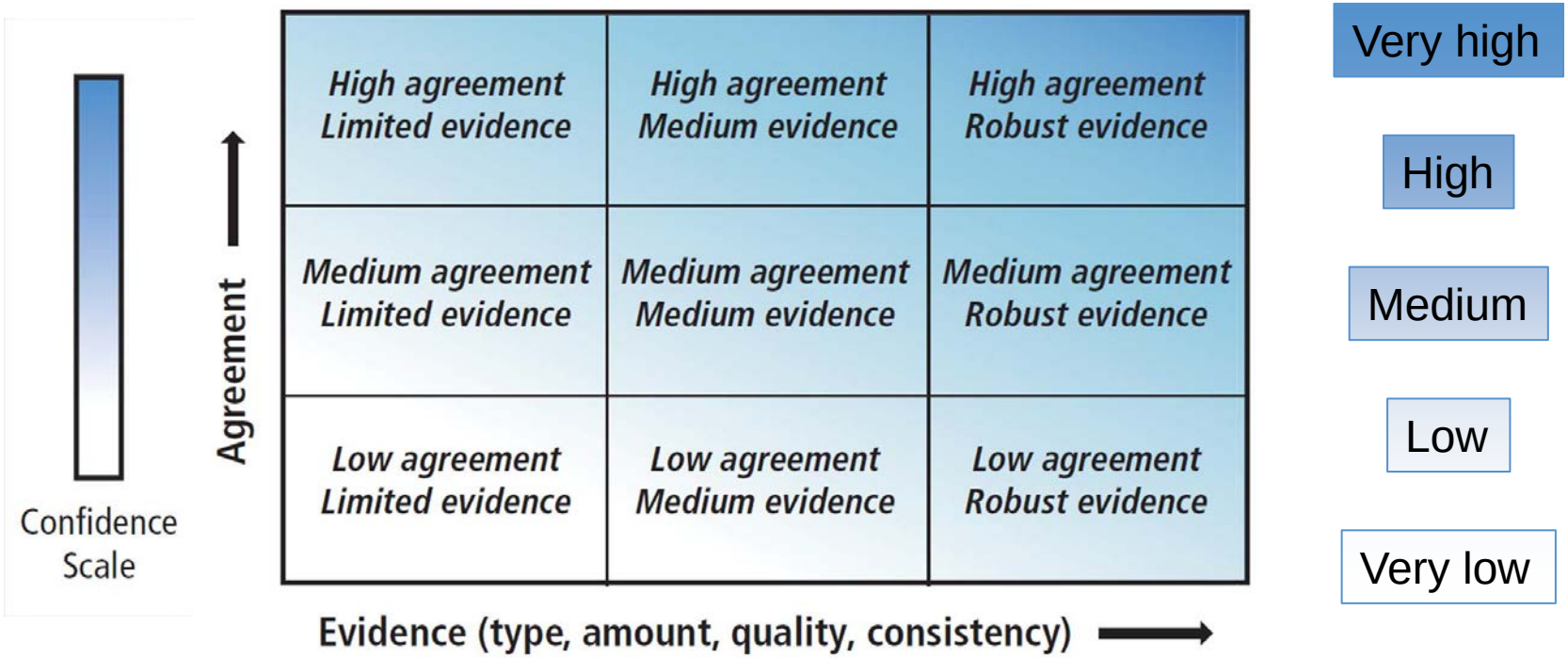
- Evaluation provides basis for findings



In WG1, assessments of *evidence and agreement* are usually reported <u>implicitly</u> in the form of a traceable account of the evidence.

Confidence

- Qualitative judgment about the validity of a finding



WG1 makes many explicit confidence assessments.

Likelihood

- Quantified measure of the certainty in a finding
- Expressed as a probability
- Based on statistical or modelling analysis, expert judgment, or other approaches

Virtually certain	≥ 99%
Very likely	≥ 90%
Likely	≥ 66%

Unlikely	≤ 33%
Very unlikely	≤ 10%
Exceptionally unlikely	≤ 1%

+ a few other less frequently used terms

Two Examples

Example: confidence assessment

Assessment:

> "The current centennial rate of global mean sea level rise is unusually high in the context of centennial-scale variations over the last two millennia (*medium confidence*)."

(FD, 7 June 2013, page SPM-5, lines 54-55).

Discussion:

- There is *very high confidence* in estimates of the rate of sea-level rise over the past century
- Estimates of rates of sea-level change during earlier centuries are based on limited local tide-gauge and proxy records, and thus there is insufficient evidence to allow higher than *medium confidence*

Example: likelihood assessment

Assessment:

> "Increase of global mean surface temperatures for 2081-2100 … is *likely* to be … 2.6-4.8°C (RCP8.5)"
>
> [relative to 1986-2005]

(FD, 7 June 2013, page SPM-13, lines 32-34).

Discussion:

- CMIP5 models project a warming in the range 2.6-4.8°C under RCP8.5 [5-95% model range]
- The model range does not include all sources of uncertainty ➔ this range is conservatively reported as *likely*
- The warming for 2046-2065 is *likely* to be 1.4-2.6°C (RCP8.5) but confidence is *medium* because the relative contributions of some uncertainties is higher

Climate Change 2013: The Physical Science Basis

Working Group I contribution to the IPCC Fifth Assessment Report

Further Information

www.climatechange2013.org

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