

Climate Education

What role can the IPCC play?



IPCC Reports (1990 – 2014)

Robin Matthews

IPCC Working Group I Technical Support Unit

Three challenges of Climate Change



**Scientific &
Technical**



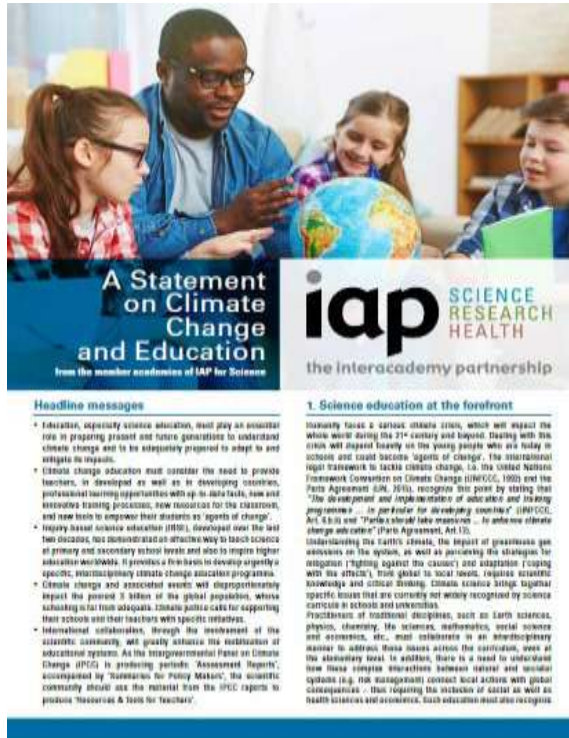
**Policy &
Practice**



**Communication &
Education**

Adapted from Sir John Beddington

Growing Calls for Climate Education



IAP Statement on Climate Change and Education (2017)



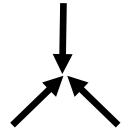
International Youth White Paper on Climate Change (2018)



Climate
Science



Local to
Global



Impacts



Mitigation



Adaptation



Targets



Ecology

C

L

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E

D

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O

N

Empowerment;
Equity; Empathy

Universal
design

Arts +
STEM

Innovative
teaching

Non-climatic
factors

Dynamic systems
thinking

Critical
thinking

Traditional &
Local Knowledge

Opinions vs.
facts

Where does the IPCC fit in?

Types of IPCC reports



WGI Reports
Physical Science



WGII Reports
Impacts, Adaptation & Vulnerability



WGIII Reports
Mitigation

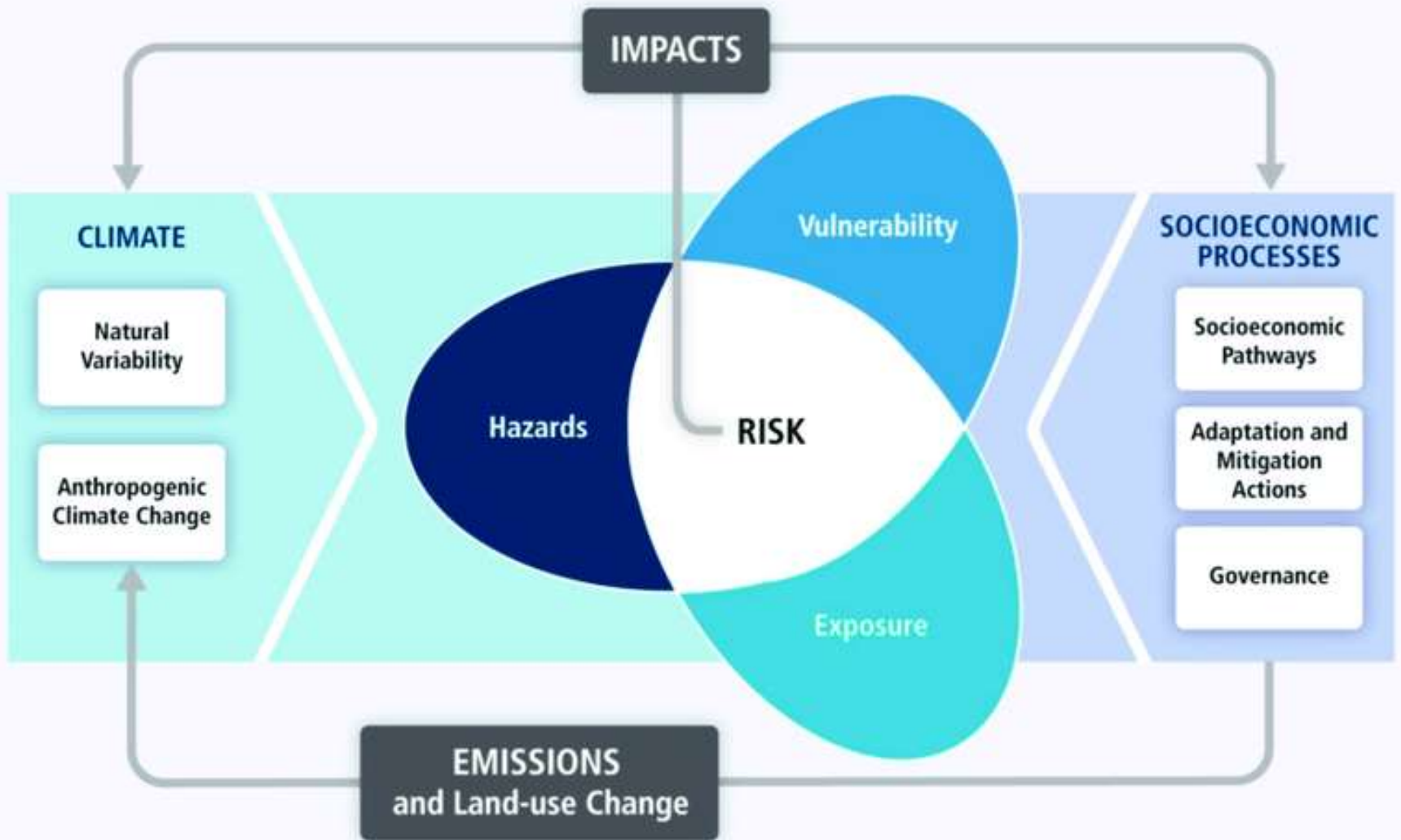


Special Reports

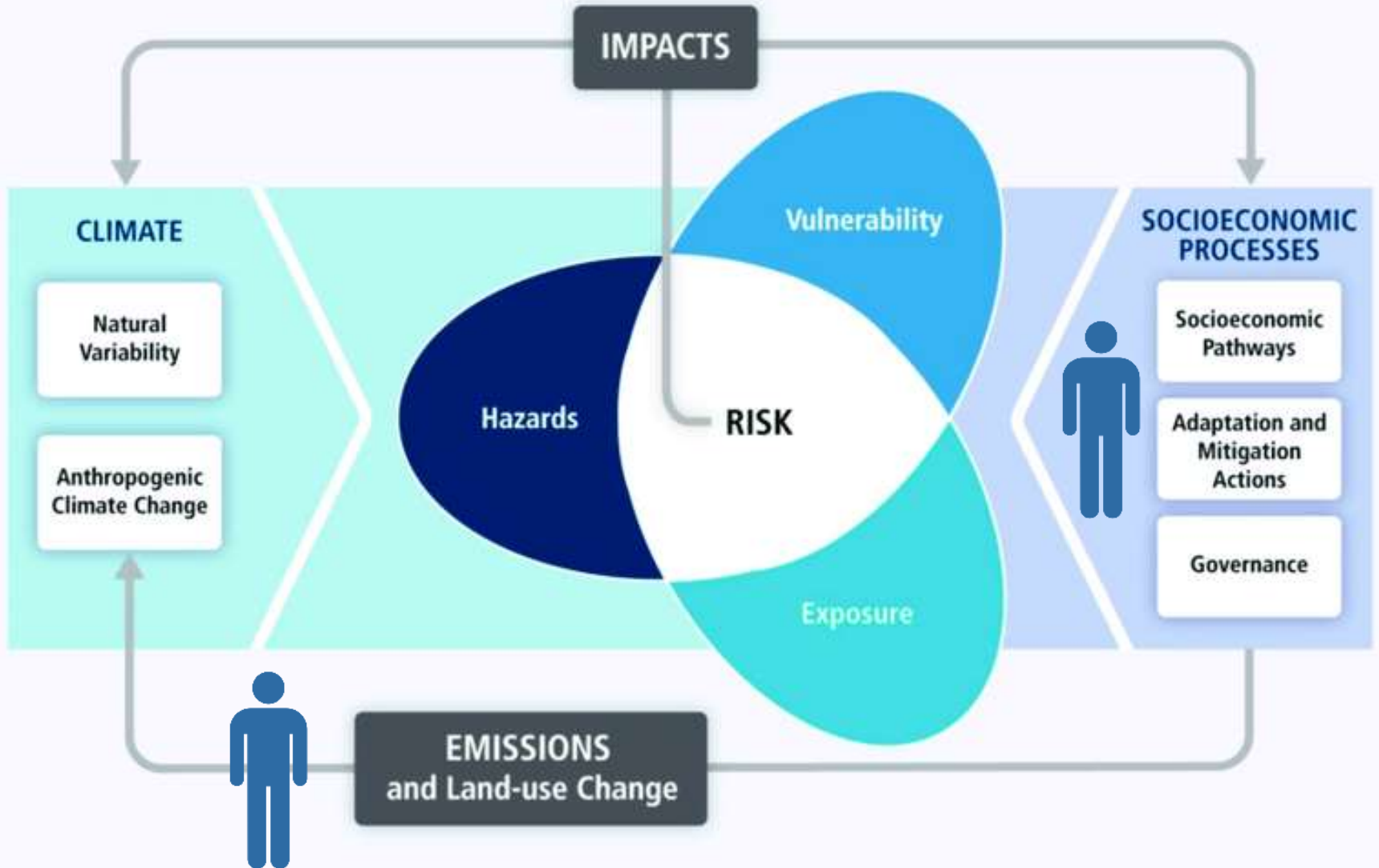


Synthesis Reports

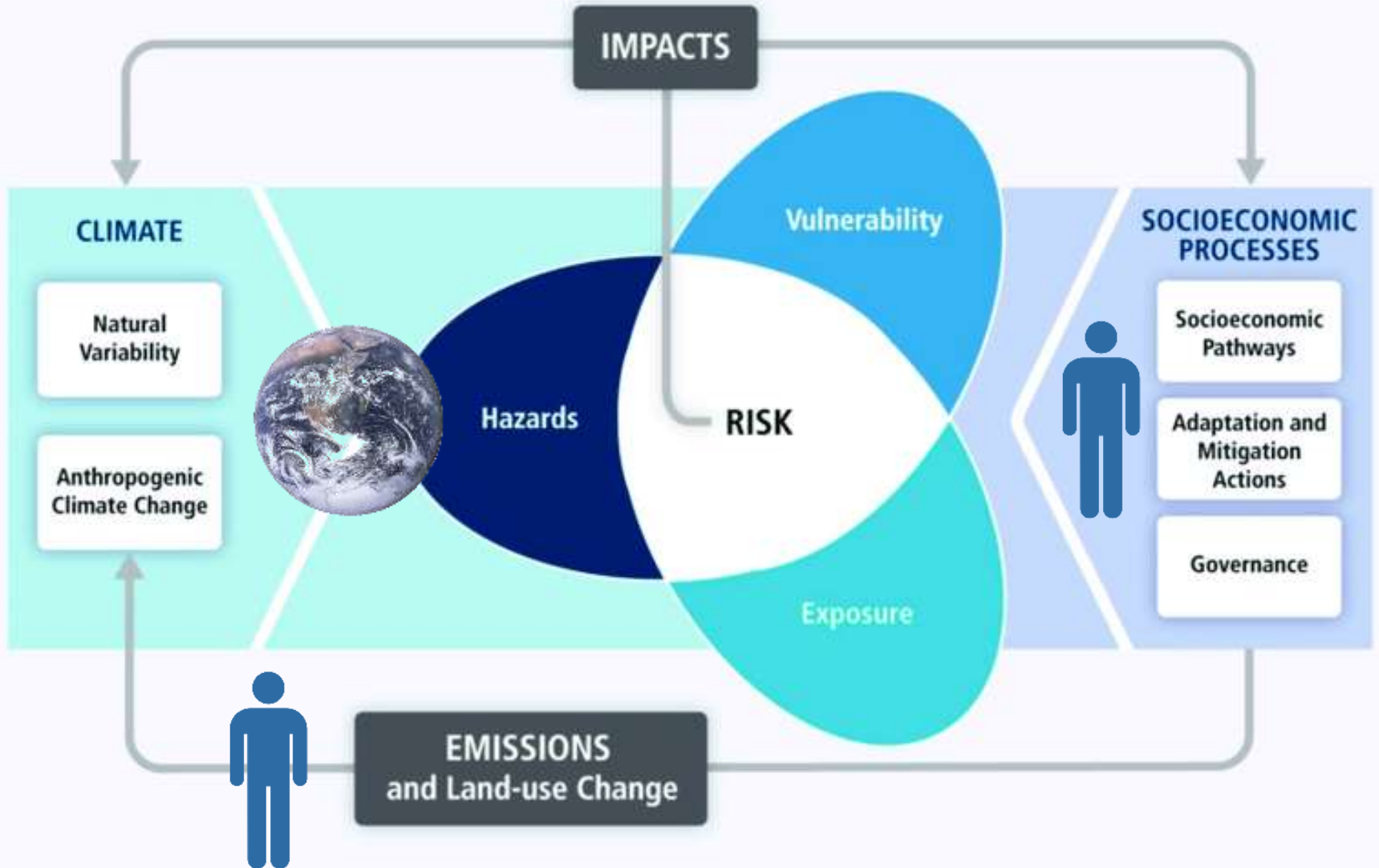
The IPCC Risk Framework



The IPCC Risk Framework



The IPCC Risk Framework



A Conceptual Framework to access IPCC reports

Time scales

Paleoclimate to 2300 and beyond

Space scales

Global to local

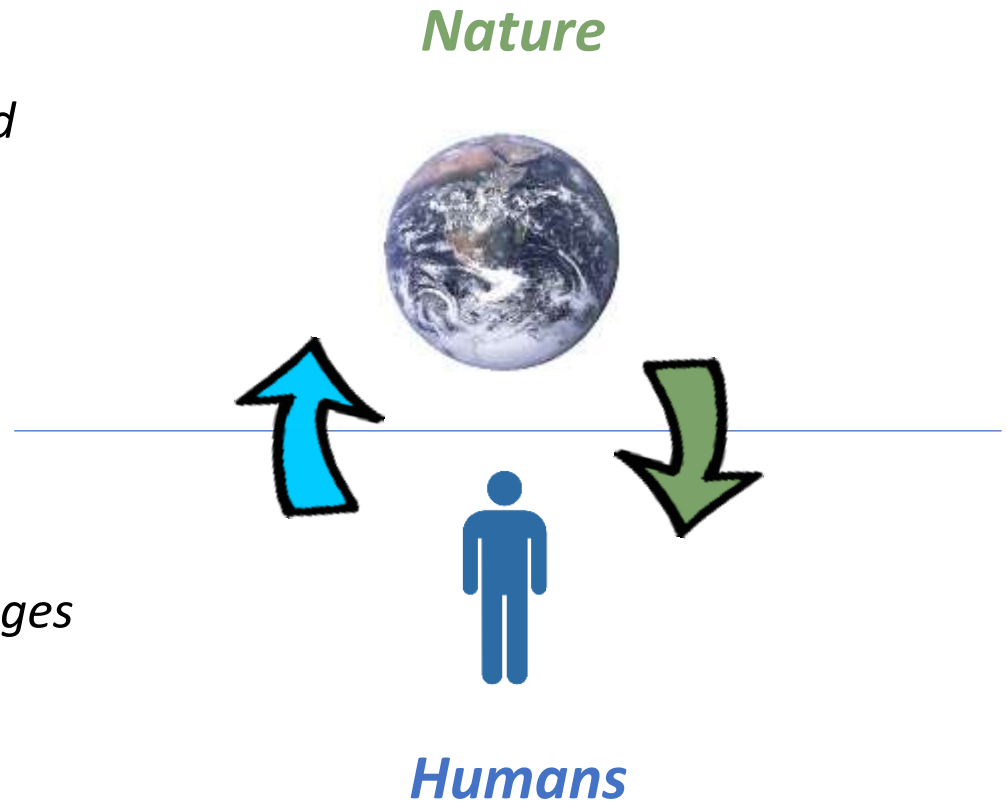
Rates of change

Climatic and Socio-economic changes

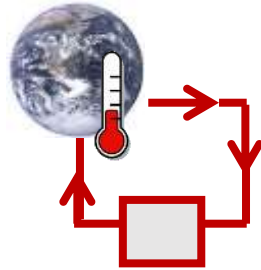
Magnitudes of risks

Climatic and Socio-economic risks

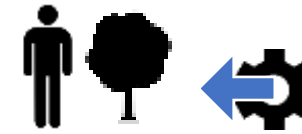
Uncertainties



Climate forcing & processes



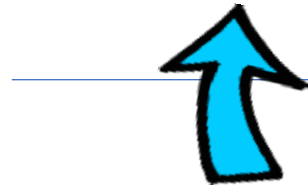
Hazards



Impacts



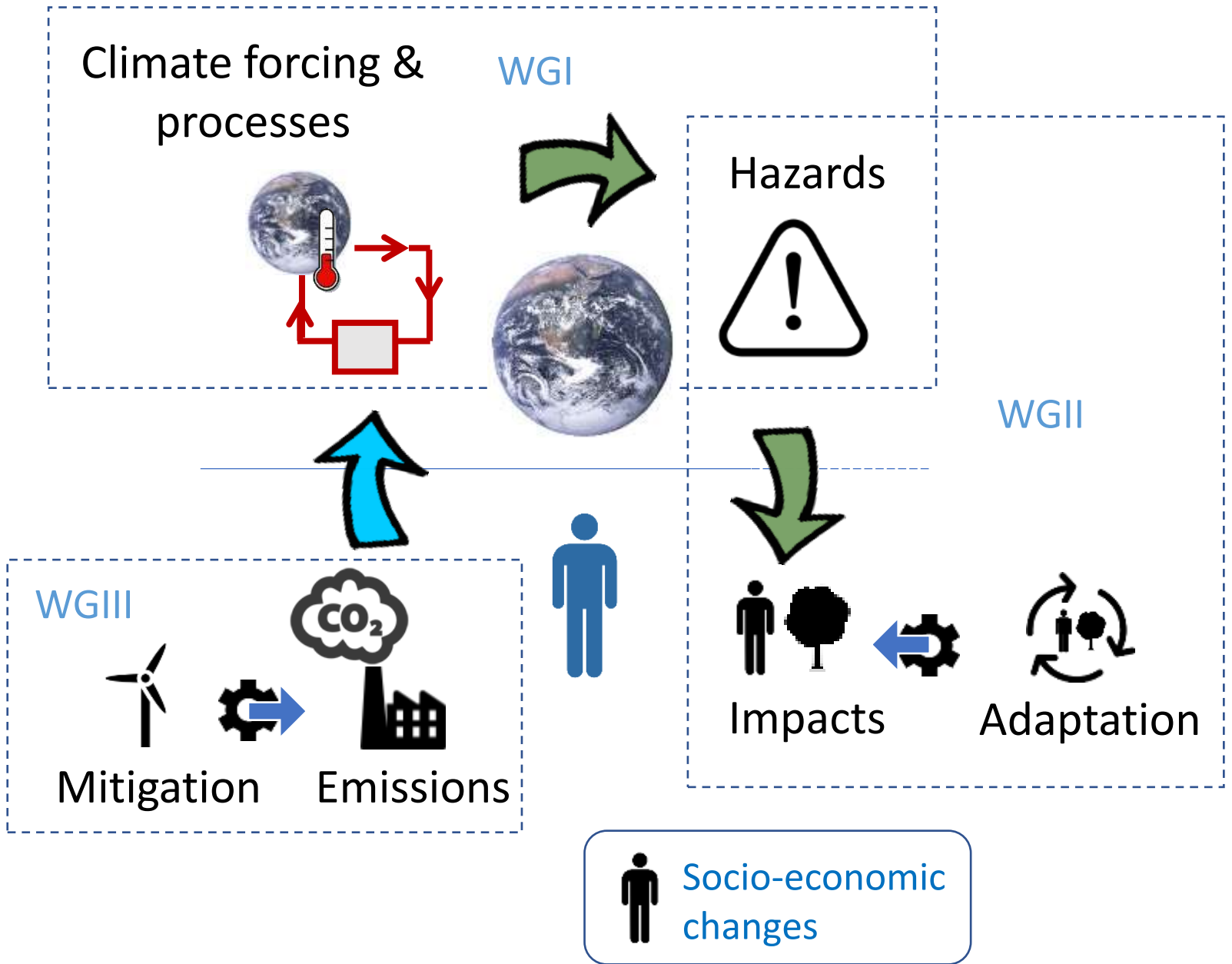
Adaptation



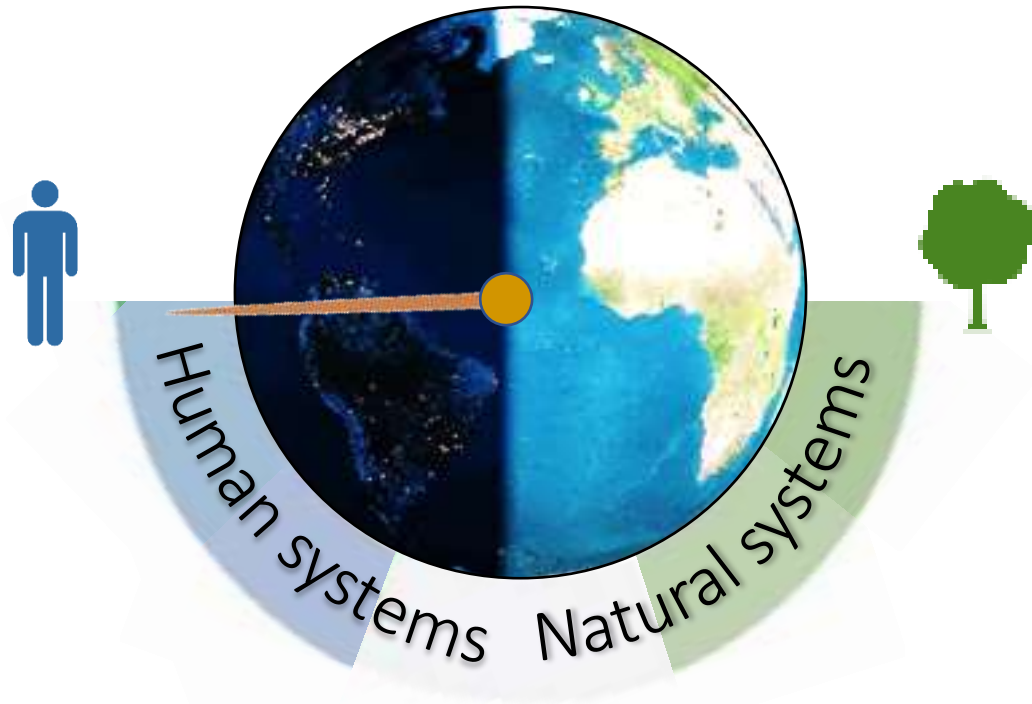
Mitigation



Emissions



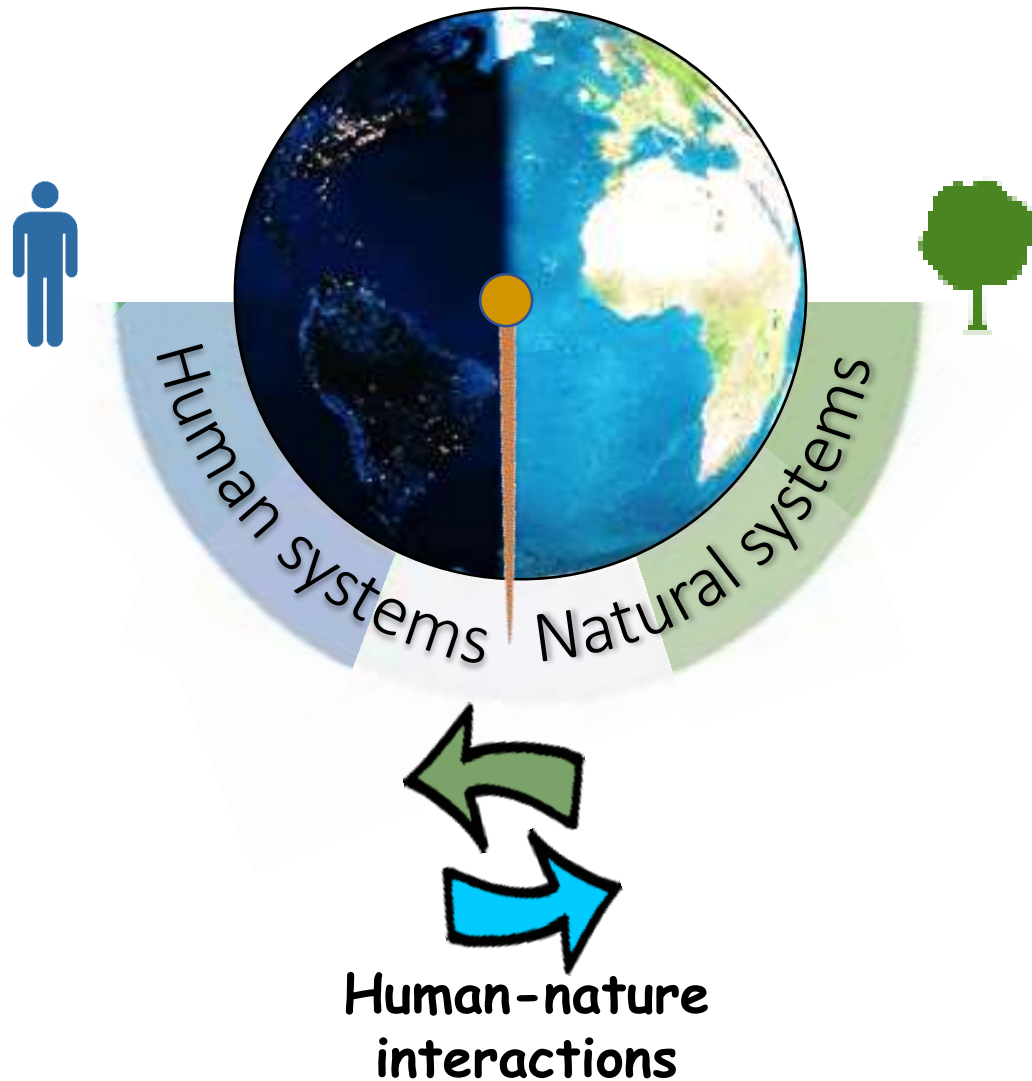
Bringing Climate Education into Disciplinary Subjects



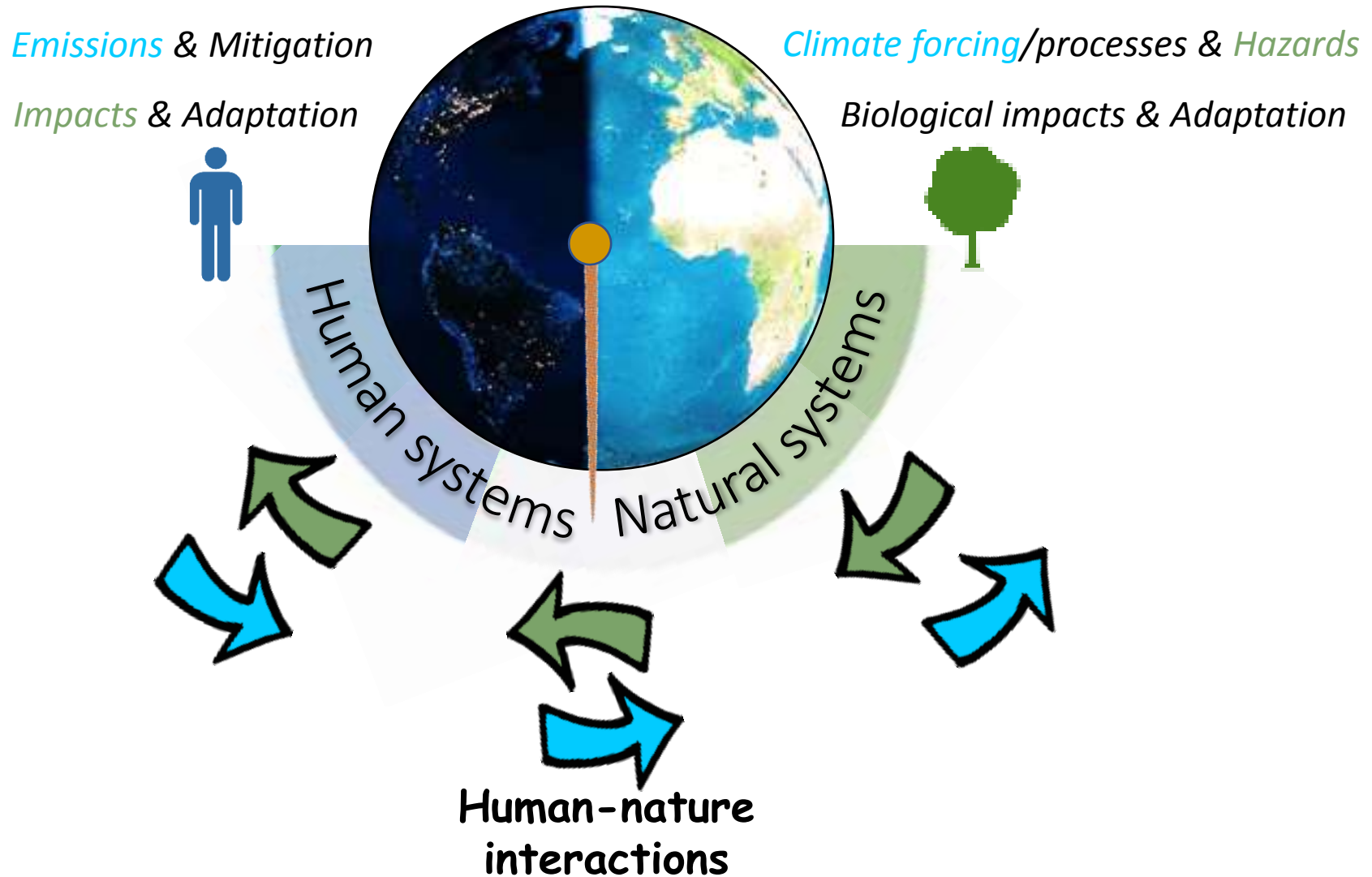
Bringing Climate Education into Disciplinary Subjects



Bringing Climate Education into Disciplinary Subjects



Bringing Climate Education into Disciplinary Subjects



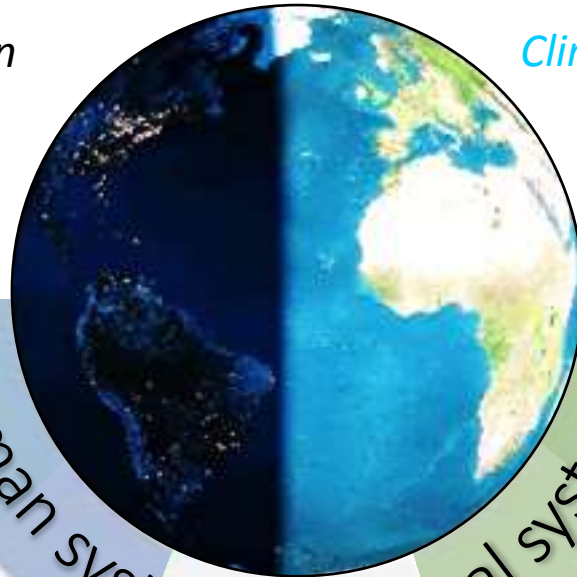
Bringing Climate Education into Disciplinary Subjects

Emissions & Mitigation

Impacts & Adaptation



Psychology
Languages IT
Business & Economics
Political Science Arts
Social studies History
Philosophy Medicine
Human Geography Engineering
Chemistry



Climate forcing/processes & Hazards

Biological impacts & Adaptation



Human systems Natural systems

Environmental Science
Agriculture
Hydrology

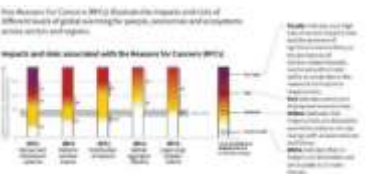
Natural history
Biology
Physical Geography
Atmospheric Science
Ocean Science
Physics & Astronomy

Guide to IPCC Reports for Educators

SPM

A. Understanding Global Warming of 1.5°C

A.1 Human activities are estimated to have caused approximately 1.0°C of global warming^a above pre-industrial levels, with a likely range of 0.8°C to 1.2°C. Global warming is likely to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate. (High confidence) (Figure SPM.1) (5.2)



Key Messages for Climate Action (High confidence)

- Human activities are estimated to have caused approximately 1.0°C of global warming above pre-industrial levels, with a likely range of 0.8°C to 1.2°C.
- Global warming is likely to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate.
- Human activities are estimated to have caused approximately 1.0°C of global warming above pre-industrial levels, with a likely range of 0.8°C to 1.2°C.

Impacts and Risks associated with the Reasons for Transient 1.5°C

Key Messages for Climate Action (High confidence)

- Human activities are estimated to have caused approximately 1.0°C of global warming above pre-industrial levels, with a likely range of 0.8°C to 1.2°C.
- Global warming is likely to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate.
- Human activities are estimated to have caused approximately 1.0°C of global warming above pre-industrial levels, with a likely range of 0.8°C to 1.2°C.

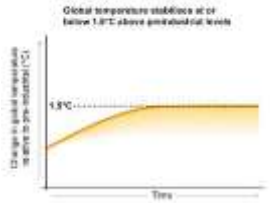


Report overview

FAQs

FAQ2.1 Conceptual pathways that limit global warming to 1.5°C

Two main pathways illustrate different interpretations for limiting global warming to 1.5°C. The consequences will be different depending on the pathway.



Concepts

Executive summaries

1.5°C and 2°C Warmer Worlds

The global climate has changed relative to the pre-industrial period, and there are multiple lines of evidence that these changes have had impacts on organisms and ecosystems, as well as on human systems and well-being (High confidence). The increase in global mean surface temperature (GMST), which reached 0.87°C in 2009–2015 relative to 1850–1900, has increased the frequency and magnitude of impacts (High confidence), strengthening evidence of how an increase in GMST of 1.5°C or more could impact natural and human systems (1.5°C versus 2°C). (3.3, 3.4, 3.5, 3.6, Cross-Chapter Boxes 6, 7 and 8 in this chapter)



Quantitative info

Cross-chapter boxes



Topic overview

Glossary

Global mean surface temperature (GMST) Estimated global average of measurements of temperature over land and sea-ice, and the surface temperatures over the high-latitude regions with changes normally expressed as deviations from a mean over a specified reference period. When increasing changes in GMST, mean surface air temperature over both land and ocean are observed. See also Land surface air temperature, Sea surface temperature (SST) and Global mean surface air temperature (GMSAT).

Global mean surface air temperature (GMSAT) Global average of atmospheric temperature over land and ocean. Changes in GMSAT are often used as a measure of global temperature change in climate models, but are not observed directly. See also Global mean surface temperature (GMST) and Land surface air temperature.

Global warming The estimated increase in global surface temperature (GMST) averaged over a 30-year period, or period centered on a particular year or decade, expressed in terms of the likelihood of exceeding a specified temperature range over a 30-year period. The annual and decadal variations associated to climate variability (El Niño and La Niña) are



Concepts

References

Adger, S., S. Colfer, and S. W. D. (2015) Incentives for coastal climate change adaptation in small island developing states. *Nature Climate Change*, 5(11), 85–90. doi:10.1038/nclimate2600

Auld, L., K. Brown, and S. Lindstedt. (2017) The Scope of Action for Local Climate Policy: The Case of Norway. *Global Environmental Politics*, 7(2), 83–105. doi:10.1215/15250025-2017-2-3

Auro, H., and A. P. (2016) The Role of Adaptation of coastal climate change in the face of sea level rise. *Journal of Environmental Psychology*, 20(1), 15–22. doi:10.1016/j.jep.2015.11.006

Auro, H., E. Verplanken, and A. Krippenborg. (2008) From Action to the Past: Perceived Decision Making in a Climate Change Context. *Journal of Applied Social Psychology*, 38(13), 1765–1784. doi:10.1111/j.1521-0898.2008.01811.x

Barrois, J.-C., E. S. R. M., M. M., and H. J. (2015) The mitigation potential of CO₂ conversion to fuels. *Energy*, 90(12), 2497–2499. doi:10.1016/j.energy.2015.08.020



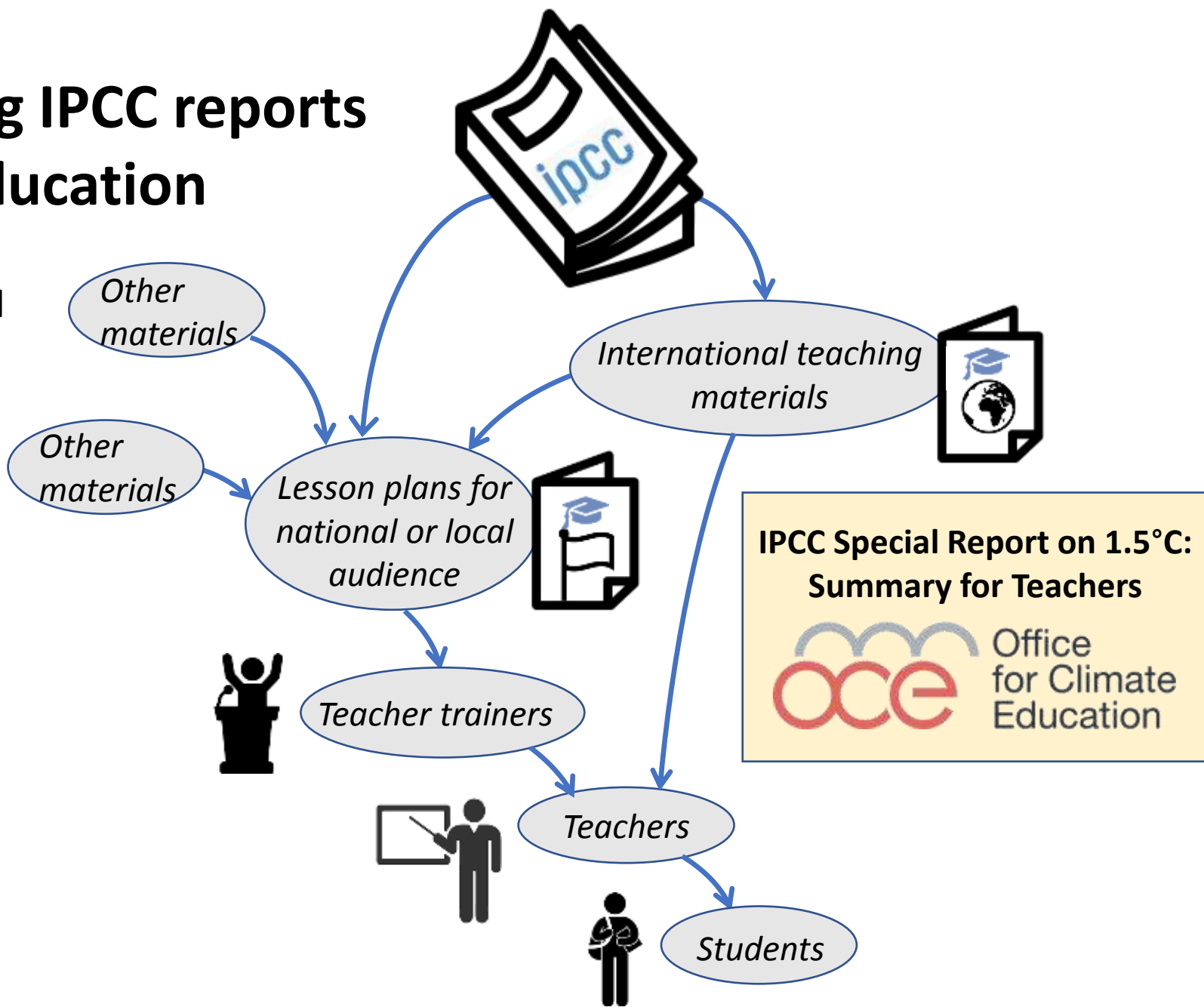
Specific studies

Using IPCC reports in education

Global



Local



How can the IPCC help educators?



Have educational usage in mind during report development



Connect educational organizations with IPCC authors



Help locate materials

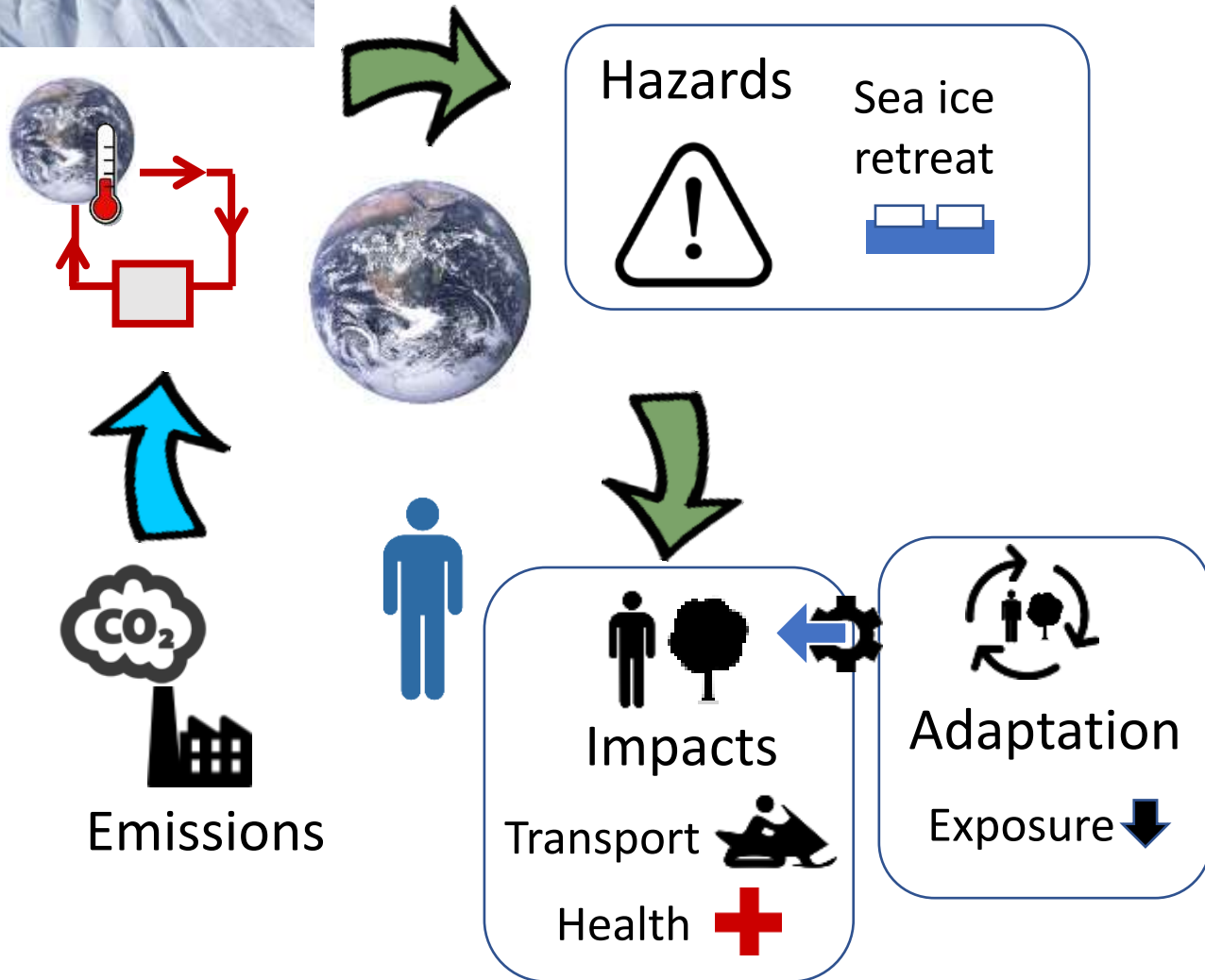
For the Special Report on 1.5°C contact:

wg1tsu@ipcc-wg1.fr

Examples



The Smart Ice project



Snowpiercer (2013)



Climate forcing & processes



Raised Earth's Albedo



Hazards

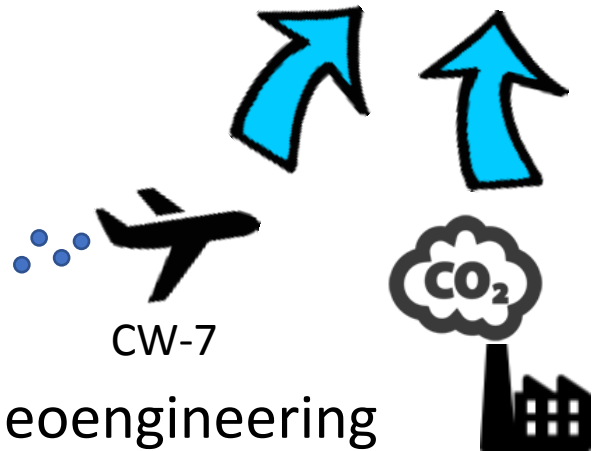


Snowball Earth



Adaptation

Exposure ↓



Geoengineering

Emissions



Impacts

Health +



The IPCC itself as a Teaching Topic

The Science–Policy interface



IPCC Uncertainty language

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





Synopsis

Climate education is much more than **climate science**

Educators can approach IPCC reports using a **conceptual framework**

IPCC Reports **quantify rates of change** and **magnitudes of risks**

Report **FAQs**, **Cross-Chapter Boxes** and **Glossaries** explain concepts

Multi-step translation required to use reports in **local ed. contexts**

Front Cover for the Special Report on 1.5°C

Alisa Singer

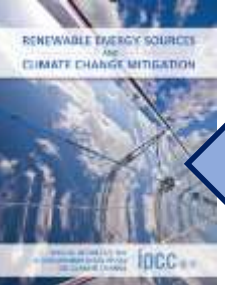
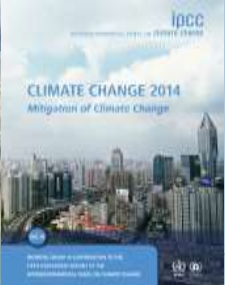
Environmental Graphiti

Melissa Gomis

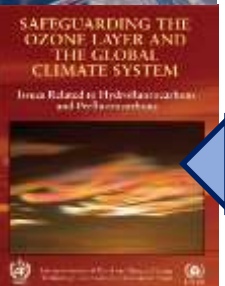
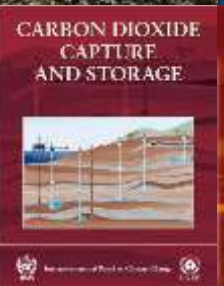
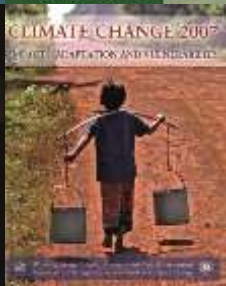
IPCC Working Group I Technical Support Unit

Robin Matthews

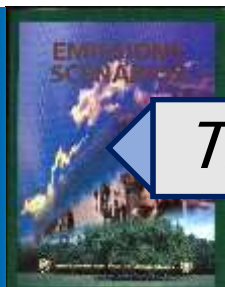
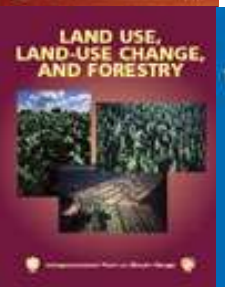
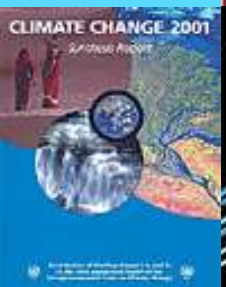
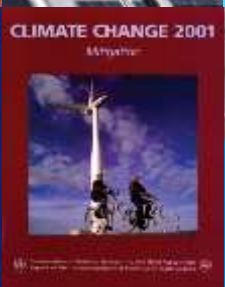
Front Cover Committee



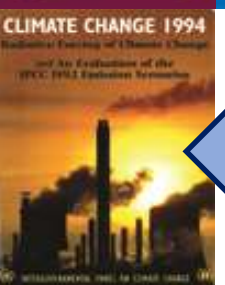
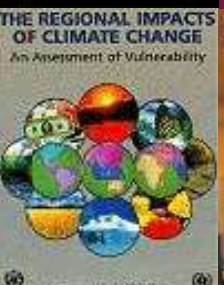
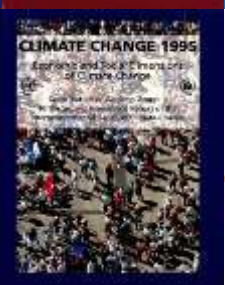
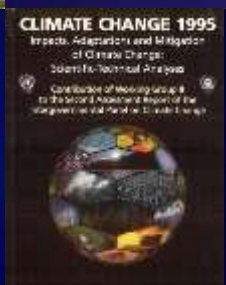
AR5



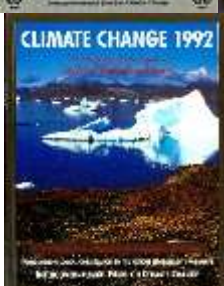
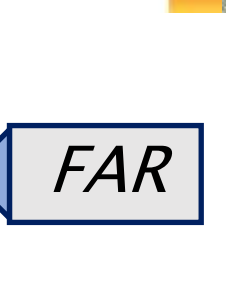
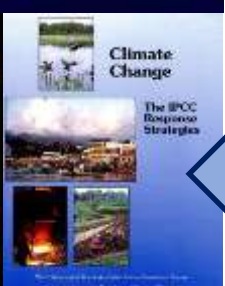
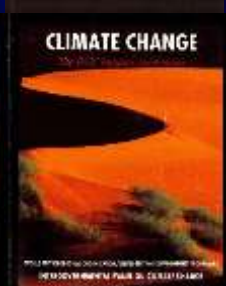
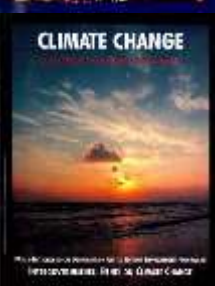
AR4



TAR



SAR



1992 Supp. reports

Climate Education

Panel Discussion

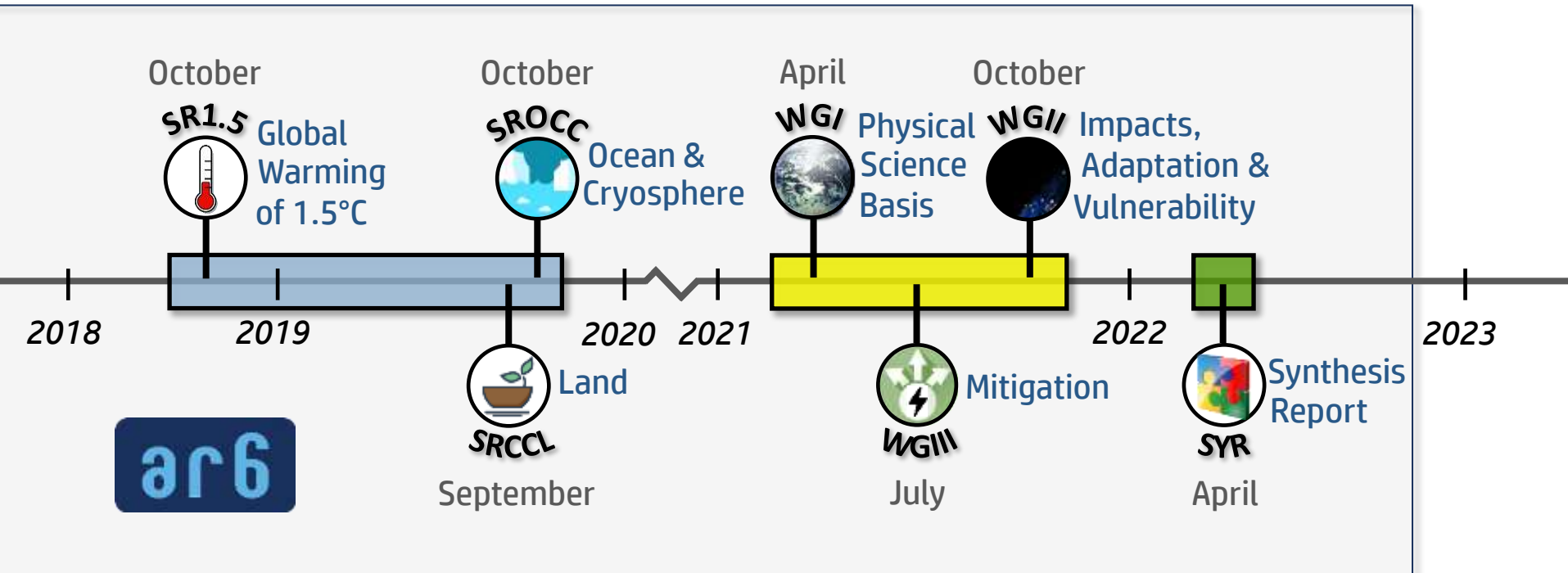


The IPCC Sixth Assessment Cycle

Three Special Reports and a Methodology Report

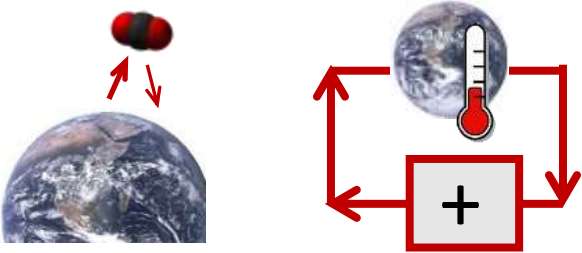
Three Working Group Reports

A Synthesis Report



The Industrial period

Climate forcing & processes



Hazards



Warming

Sea level rise

Melting ice

Ocean acidification

Changes in heatwaves



Fossil fuel combustion



Land use change



Emissions



Impacts

Ecosystems

Freshwater

Health & security

Livelihoods

Agriculture

Infrastructure



Population growth



Economic growth

