

# CLIMATE DIALOGUE

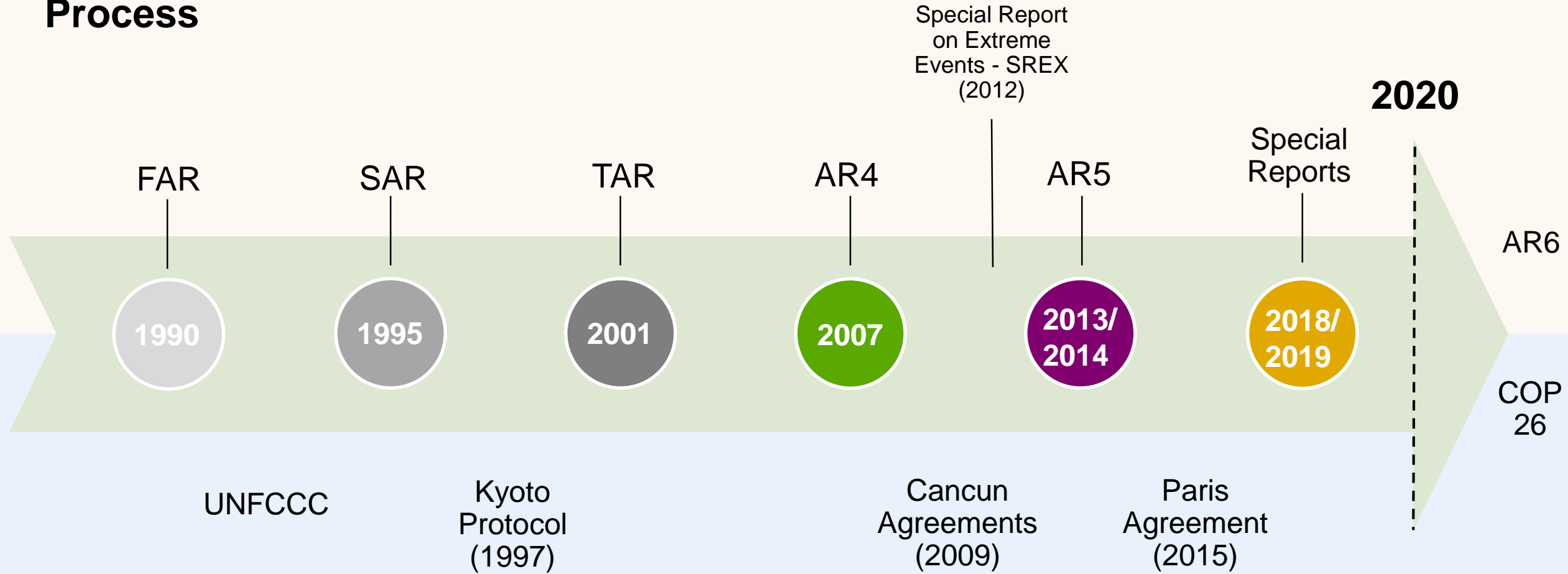
Sharing evidence on progress towards implementation and ambition in the pre-2020 period

*Evolution of IPCC Assessment Findings*

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Co-Chair IPCC WG III  
30 November 2020



# IPCC Process



# UNFCCC Process

# EMERGING SCIENCE: SIX LINES OF PROGRESS



Key concepts



Scenarios



Attribution



Adaptation<sup>1</sup>



Mitigation



Interactions<sup>2</sup>

<sup>1</sup> Used as shorthand for impacts, adaptation and risk management

<sup>2</sup> Used as shorthand for synergies and trade-offs between adaptation, mitigation and sustainable development

# AR4 (2007)



## Key concepts

Confirms TAR “reasons for concern”



## Scenarios

Use of the **SRES scenarios** developed by IPCC



## Attribution

“Warming of the climate system is **unequivocal**”



## Adaptation

“A wide array of adaptation options is available, but **more extensive adaptation...is required to reduce vulnerability**. Adaptive capacity is intimately **connected to social and economic development** but is unevenly distributed”



## Mitigation

“Substantial **economic potential** for the mitigation of global GHG emissions over the coming decades that could **offset the projected growth** of global emissions or **reduce emissions** below current levels”



## Interactions

“Climate response options can be implemented to **realise synergies and avoid conflicts** with other dimensions of **sustainable development.**”

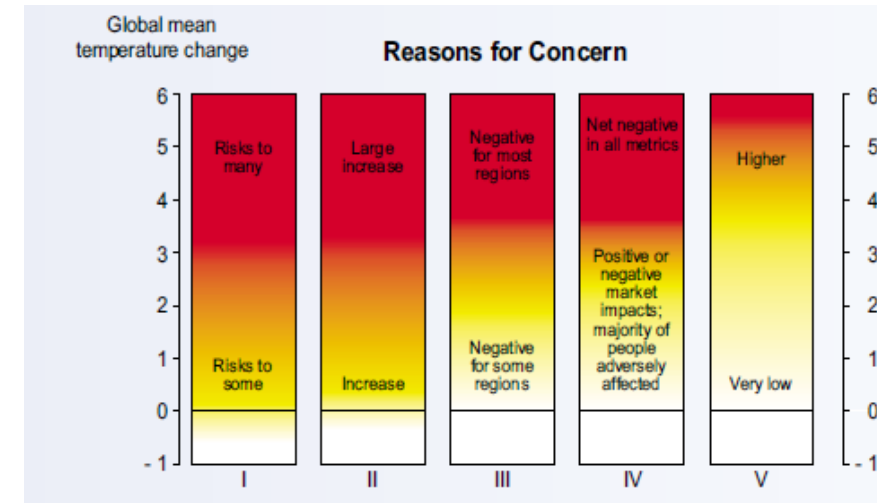


Figure 6.3 (TAR)

# SREX (2012)



## Key concepts

Risk as interplay between exposure/vulnerability/climate



## Scenarios

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## Attribution

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## Adaptation

**Integrating** climate science, climate impacts and disaster management communities



## Mitigation

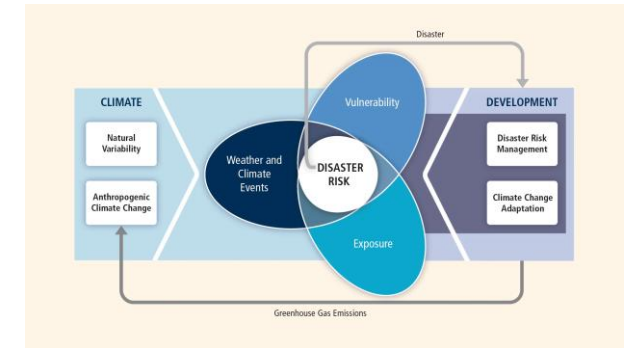
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## Interactions

A prerequisite for sustainability in the context of climate change is **addressing the underlying causes of vulnerability**, including....**structural inequalities**

Figure SPM 1 (SREX)



# AR5 (2014)



## Key concepts

Warming depends on **cumulative CO<sub>2</sub>**.  
Introduced the concept of a **“gap”** in relation to the Cancun pledges.



## Scenarios

Assessment of published scenarios classified by CO<sub>2</sub> concentrations.  
First use of **“representative concentration pathways”** (RCPs)



## Attribution

“It is extremely likely that **human influence has been the dominant cause** of the observed warming since the mid-20th century.



## Adaptation

“**Adaptation can reduce the risks of climate change impacts**, but there are **limits to its effectiveness**, especially with greater magnitudes and rates of climate change”.



## Mitigation

“There are **multiple mitigation pathways** that are likely to limit warming to below 2°C relative to pre-industrial levels. These pathways would require **substantial emissions reductions** over the next few decades and near zero emissions of CO<sub>2</sub> and other long-lived greenhouse gases **by the end of the century**”



## Interactions

“Adaptation and mitigation are **complementary strategies** for reducing and managing the risks of climate change”. “Adaptation and mitigation responses are **underpinned by common enabling factors**. These include effective institutions and governance, innovation and investments in environmentally sound technologies and infrastructure, sustainable livelihoods and behavioural and lifestyle choices.”

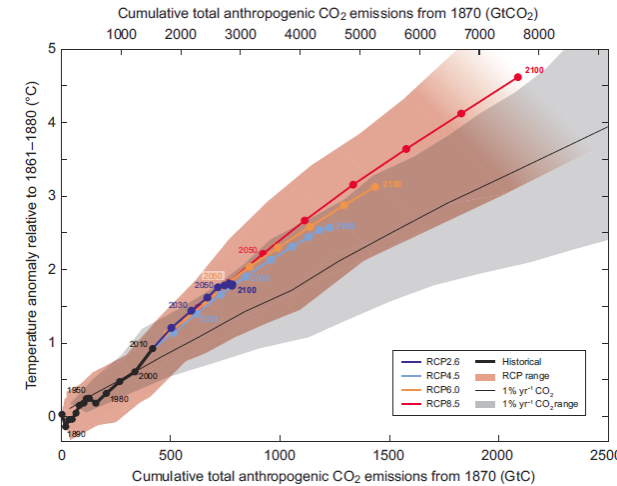


Figure SPM 10, (WG I, AR5)

# SR15 (2018)



## Key concepts

**Carbon budgets, net zero emissions and temperature overshoot.**  
Limits to adaptation. Integrating WG I, WG II and WG III communities



## Scenarios

Assessment of published scenarios classified by warming levels.  
**Illustrative emission and mitigation pathways**



## Attribution

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## Adaptation

**Adaptation needs will be lower** for global warming of **1.5°C** compared to 2°C



## Mitigation

**“Rapid and far-reaching transitions in all systems”. “All pathways that limit global warming to 1.5°C with limited or no overshoot project the use of carbon dioxide removal (CDR)”**



## Interactions

**“Strengthening the global response in the context of sustainable development and efforts to eradicate poverty”**  
**Systematic mapping of response options across the SDGs**

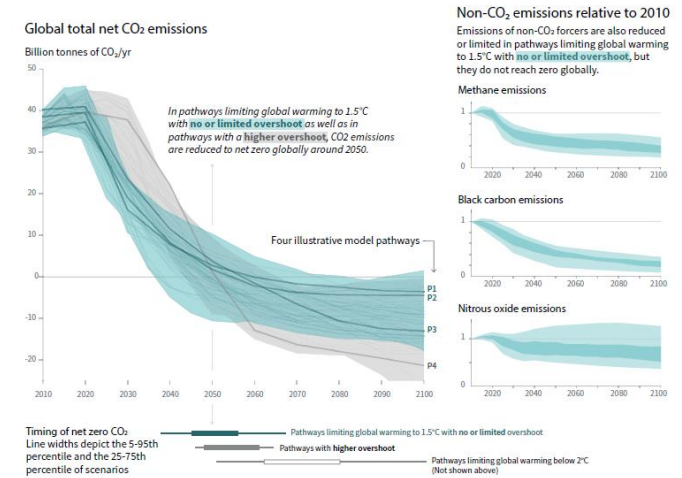


Figure SPM 3a (SR15)

# SRCCL (2019)



## Key concepts

Environmental and socio-economic Implications of response options contributing to mitigation  
The food system treated holistically



## Scenarios

First explicit use of “**shared socio-economic pathways**” (SSPs)



## Attribution

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## Adaptation

The potential for action based on existing knowledge



## Mitigation

“All assessed modelled pathways that limit warming to 1.5°C or well below 2°C require **land-based mitigation and land-use change**, with most including different combinations of reforestation, afforestation, reduced deforestation, and bioenergy “



## Interactions

“Different **socioeconomic pathways** affect levels of **climate related risks**”

“Acknowledging **co-benefits and trade-offs** when designing land and food **policies** can overcome barriers to implementation”

“The effectiveness of decision-making and governance is enhanced by the **involvement of local stakeholders** (particularly those most **vulnerable to climate change**)”

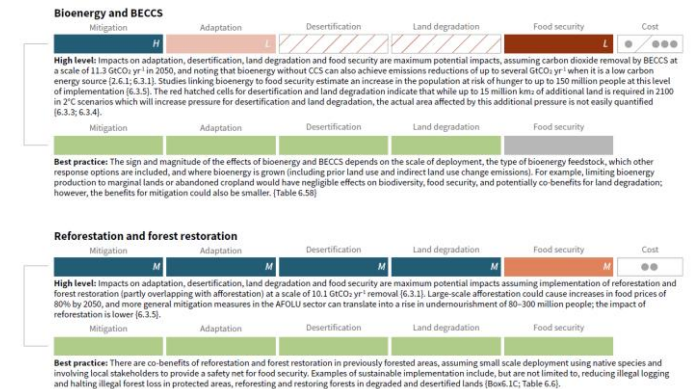


Figure SPM 3b (SRCCL)



# SROCC (2019)



## Key concepts

**Ecosystem services** used as a central concept.



## Scenarios

Used the **Representative Concentration Pathways (RCPs)**



## Attribution

“**The global ocean** has warmed unabated since 1970 and has taken up more than **90% of the excess heat in the climate system**”  
“Global warming has led to widespread shrinking of the cryosphere, with **mass loss from ice sheets and glaciers, reductions in snow cover and Arctic sea ice extent and thickness**”.



## Adaptation

“The **shrinking cryosphere in the Arctic and high mountain areas** has led to predominantly negative impacts on food security, water resources, water quality, livelihoods, health and well-being, infrastructure, transportation, tourism and recreation, as well as **culture of human societies, particularly for Indigenous peoples**”



## Mitigation

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## Interactions

“Key enablers for implementing effective responses to climate-related changes in the ocean and cryosphere include **intensifying cooperation and coordination among governing authorities** across spatial scales and planning horizons”.

### Sea level rise risk and responses

The term response is used here instead of adaptation because some responses, such as retreat, may or may not be considered to be adaptation.

#### (a) Risk in 2100 under different sea level rise and response scenarios

Risk for illustrative geographies based on mean sea level changes (medium confidence)

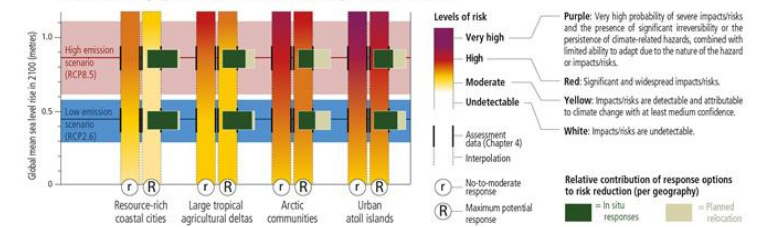


Figure SPM 5.b (SROCC)

# SCIENCE DOES NOT SLEEP!

AR6 reports in draft reflect further scientific progress

