

GCOS 27<sup>th</sup> Session Steering Committee Meeting  
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# IPCC Sixth Assessment Report Cycle

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# IPCC Sixth Assessment (AR6)

## Some overarching preliminary aspects for the Synthesis Report

- Global Stocktake
- Interaction among emissions, climate, risks and development pathways
- Economic and social costs and benefits of mitigation and adaptation in the context of development pathways
- Adaptation and mitigation actions in the context of sustainable development
- Finance and means of support

May 2019

**Emission inventories**




Oct. 2018

**Global warming of 1.5 °C**



Sept. 2019

**Oceans and cryosphere**



April 2021

**The Physical Science Basis**

October 2021

**Climate Change Impacts, Adaptation and Vulnerability**

April 2022

**The Synthesis Report**



**Talanoa dialogue UNFCCC**

**Land**



Aug. 2019

**Mitigation of Climate Change**

July 2021

**Global stocktake 2023 UNFCCC**

March 2018



Cities and Climate Change Science Conference

May 2018



Expert Meeting on Assessing Climate Information for Regions

May 2018



Expert Meeting on Short Lived Climate Forcers

*\* Dates are subject to change*

Chapter 1: Framing, context, methods

**Chapter 2: Changing state of the climate system**

Chapter 3: Human influence on the climate system

Chapter 4: Future global climate: scenario-based projections and near-term information

Chapter 5: Global carbon and other biogeochemical cycles and feedbacks

Chapter 6: Short-lived climate forcers

Chapter 7: The Earth's energy budget, climate feedbacks, and climate sensitivity

**Chapter 8: Water cycle changes**

Chapter 9: Ocean, cryosphere, and sea level change

**Chapter 10: Linking global to regional climate change**

**Chapter 11: Weather and climate extreme events in a changing climate**

Chapter 12: Climate change information for regional impact and for risk assessment

Chapter 1: Point of departure and key concepts

## **SECTION 1: Risks, adaptation and sustainability for systems impacted by climate change**

Chapter 2: Terrestrial and freshwater ecosystems and their services

Chapter 3: Ocean and coastal ecosystems and their services

Chapter 4: Water

Chapter 5: Food, fibre, and other ecosystem products

Chapter 6: Cities, settlements and key infrastructure

Chapter 7: Health, wellbeing and the changing structure of communities

Chapter 8: Poverty, livelihoods and sustainable development

## SECTION 2: Regions

### Chapter 9: Africa

Chapter 10: Asia

Chapter 11: Australasia

Chapter 12: Central and South America

Chapter 13: Europe

Chapter 14: North America

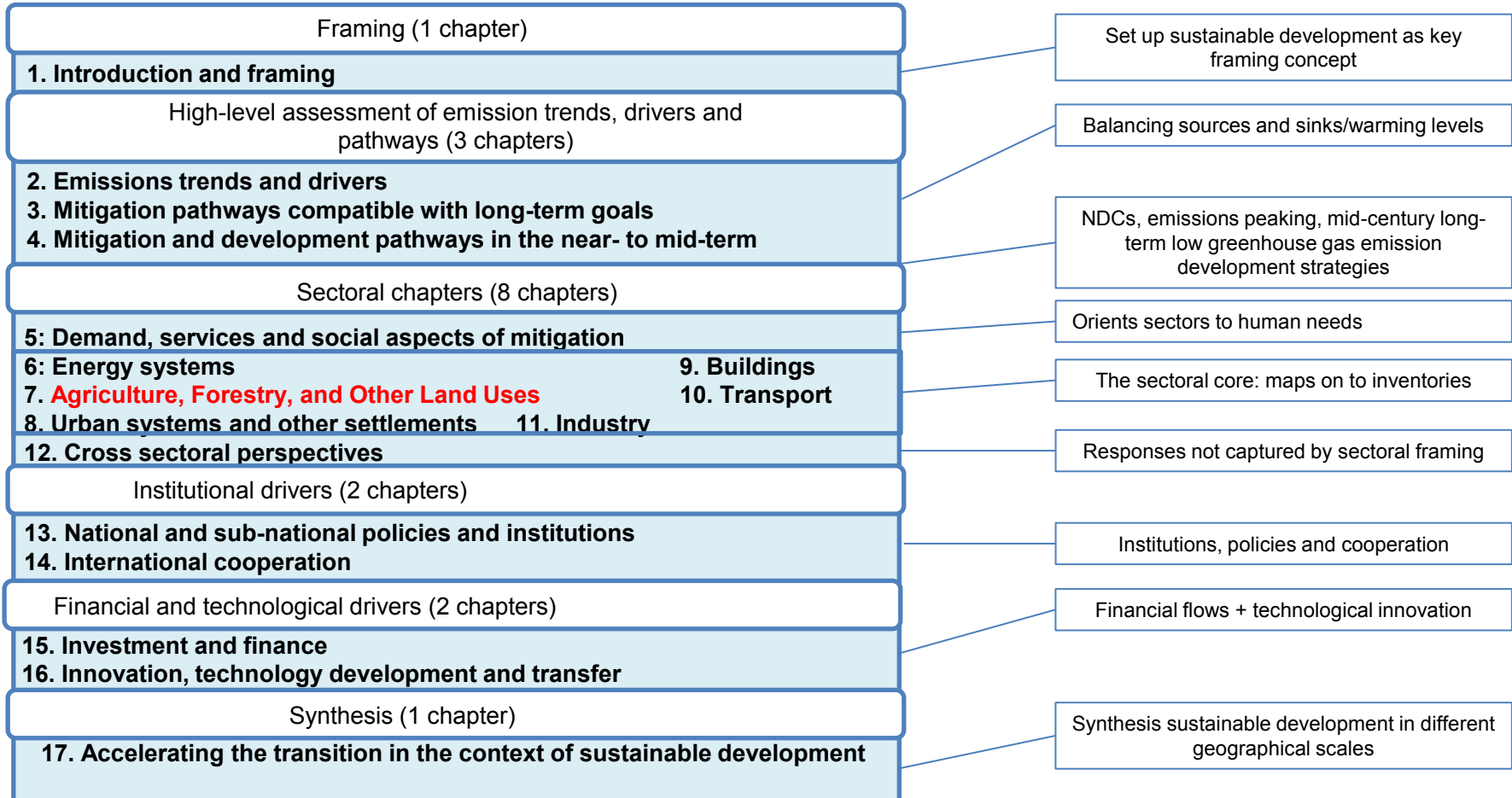
Chapter 15: Small Islands

## SECTION 3: Sustainable development pathways: integrating adaptation and mitigation

Chapter 16: Key risks across sectors and regions

Chapter 17: Decision-making options for managing risk

Chapter 18: Climate resilient development pathways



# Data Support for Climate Change Assessment

- **Under responsibility of Task Group on Data (TG-Data)**
- Provide guidance to the IPCC's Data Distribution Centre (DDC) in order to provide curation, transparency, traceability and stability of data and scenarios related to the reports of the IPCC
- Facilitate, in cooperation with the DDC, the availability and consistent use of climate change related data and scenarios in support of the implementation of the work program of the IPCC
- Facilitate in cooperation with the DDC the availability and use of climate change related data resulting from the activities of the IPCC in accordance with the mandate of the IPCC.

# Some Knowledge and Data Gaps in SRCCL and SROCC



# Special Report on Climate Change and Land (SRCCL) Outline



Chapter 1: Framing and Context

Chapter 2: Land–Climate interactions

Chapter 3: Desertification

Chapter 4: Land Degradation

Chapter 5: Food Security

Chapter 6: Interlinkages between desertification, land degradation, food security and GHG fluxes: synergies, trade-offs and integrated response options

Chapter 7: Risk management and decision making in relation to sustainable development

# Special Report on the Ocean and Cryosphere (SROCC) Outline



Chapter 1: Framing and Context of the Report

Chapter 2: High Mountain Areas

Chapter 3: Polar Regions

Chapter 4: Sea Level Rise and Implications for Low Lying Islands, Coasts and Communities

Chapter 5: Changing Ocean, Marine Ecosystems, and Dependent Communities

Chapter 6: Extremes, Abrupt Changes and Managing Risks

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# Some Knowledge and Data Gaps in SRCCL

## ***Chapter 1: Framing and Context*** (Uncertainties in observations)

### ***Recognition of continuous improvement:***

- detection of changes in vegetation cover and structural properties
- how soil organic soil and water fluxes respond to land-use change and management
  - enhanced Earth observation capacity
  - advances in methodologies and sensors

### ***Detection of trends has been limited:***

- due to the relative shortness of the record, data gaps, data treatment algorithms
- for remote sensing - differences in the definitions of major vegetation cover classes

# Some Knowledge and Data Gaps in SRCCL

## *Chapter 3: Desertification*

- Knowledge gaps on the **extent and severity of desertification at global, regional, and local scales**
  - need for improved estimation and mapping of areas undergoing desertification
    - combination of rapidly expanding sources of remotely sensed data, ground observations and new modelling approaches

# Some Knowledge and Data Gaps in SRCCL

## *Chapter 4: Land degradation*

- Identification and monitoring of regionally differentiated sustainable land management
  - E.g., afforestation, reforestation, bioenergy crops, intensification of land management and plantation forestry

# Some Knowledge and Data Gaps in SROCC

## *Chapter 1 - Framing and Context of the Report*

- Ocean and cryosphere datasets are **frequently short, and do not always span** the key IPCC assessment **time intervals**
  - for many parameters the full magnitude of changes since the pre-industrial period is not observed
- **Brevity of ocean and cryosphere measurements** also means that some expected changes cannot yet be detected with confidence in direct observations
  - Antarctic sea ice loss, AMOC weakening
  - or other observed changes cannot yet be robustly attributed to anthropogenic factors
    - ice sheet mass loss

# Some Knowledge and Data Gaps in SROCC

## *Chapter 1 - Framing and Context of the Report*

- Observations for many key ocean variables do not yet have global coverage or have not reached the required density or accuracy for detection of change
  - E.g. ocean currents, surface heat fluxes, oxygen, inorganic carbon, subsurface salinity, phytoplankton biomass and diversity
- Deep ocean below 2000 meters is still rarely observed
  - limiting (for example) the accurate estimate of deep ocean heat uptake and, consequently the full magnitude of Earth's energy imbalance

# Some Knowledge and Data Gaps in SROCC

## *Chapter 3 – Polar Regions*

- **Need of direct measures of overturning circulation in the Southern Ocean**
  - only sparse indirect indicators of how it may be changing
  - key factor that controls heat and carbon exchanges with the atmosphere, and hence global climate
- This is a critical weakness in sustained observations of the global ocean
- **Need to better understand the evolution of polar glaciers and ice sheets, and their influences on global sea level**
  - Longer and improved quantifications of their changes are required, especially where mass losses are greatest



# Some Knowledge and Data Gaps in SROCC

## Chapter 4 – Sea Level Rise

- **Need of full-depth, high-quality and unbiased ocean temperature profile data with adequate metadata and spatio-temporal coverage**
  - required to estimate thermal expansion
  - required to understand drivers of variability and long-term change
- Global mean thermal expansion estimates revisited since AR5, based on observations only (WCRP Global Sea Level Budget Group, 2018)
  - Global mean thermal expansion time series developed with the latest data (full-depth 13-member ensemble) and corrections
    - 1.40 [1.08 to 1.72] mm/yr for 2006–2015
    - 1.36 [0.96 to 1.76] mm/yr for 1993–2015

# Some Knowledge and Data Gaps in SROCC

- **Chapter 5: Changing Ocean, Marine Ecosystems, and Dependent Communities**
- Gaps remain in **deep ocean temperature and salinity measurements** for sea-level and closure of the energy budget
- Gaps in **oxygen and carbon measurements** dense enough to measure de-oxygenation of the world ocean and track the mechanisms driving the ocean carbon cycle
- Adaptation to climate change undertaken by communities, industry and governments
  - effectiveness for mitigating the risks of climate change largely not assessed
  - precludes a global understanding of the capacity in the world to address the risks of climate change in coastal seas, open ocean and the deep sea.
- Partial solution : establishment of an **appropriate ocean and coasts database** for these types of studies

# THANK YOU FOR YOUR ATTENTION!

## For more information:

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