

**FORTY-FIFTH SESSION OF THE IPCC**  
**Guadalajara, Mexico, 28 - 31 March 2017**

IPCC-XLV/Doc. 6  
(27.II.2017)  
Agenda Item: 6.1  
ENGLISH ONLY

**SIXTH ASSESSMENT REPORT (AR6) PRODUCTS**

**Outline of the Special Report on Climate Change and Oceans and the Cryosphere**

(Prepared by the Scientific Steering Committee for the Scoping of the Special Report)

(Submitted by the Secretary of the IPCC)

## **SIXTH ASSESSMENT REPORT (AR6) PRODUCTS**

### **Outline of the Special Report on Climate Change and Oceans and the Cryosphere**

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#### **1. Introduction**

In paragraph 4 of its Decision IPCC/XLIII-6 on the Sixth Assessment Report (AR6) – Special Reports - the IPCC decided “to prepare a Special Report on climate change and oceans and the cryosphere”.

Furthermore, in paragraph 3 of its Decision IPCC/XLIII-7 on the Sixth Assessment Report (AR6) Products – Strategic Planning, the IPCC decided “to consider the draft Special Report on climate change and oceans and the cryosphere as early as possible during the Sixth Assessment Report cycle”.

Thereafter, the Chair of the IPCC established a Scientific Steering Committee, Chaired by Ms Ko Barrett, IPCC Vice Chair, to undertake the scoping of the Special Report under the joint scientific leadership of Working Groups I and II with support from the Working Group II Technical Support Unit.

#### **2. Scoping Meeting**

A Scoping Meeting for the IPCC Special Report on Climate Change and Oceans and the Cryosphere was held in Monaco, from 6 to 9 December 2016.

Participants were invited to discuss all aspects of the scope, outline, and contents of the report. The proposed outline for the Special Report was developed over the course of the scoping meeting. After intensive discussions within an iterative process between plenary sessions, breakout groups and stocktaking sessions, unanimous agreement of the participants was reached on the structure presented in Annex I.

There was agreement across the participants that the title should capture the full Special Report mandate. It was recognized by participants that the human dimension of the Special Report was not well captured in the title and the participants agreed that the communication experts within the IPCC Secretariat could be tasked with suggesting an appropriate subtitle that best captures these human dimensions. However, an appropriate subtitle that communicated these dimensions while also being both scientifically accurate and consistent with the underlying content of the proposed outline was not identified.

#### **3. Proposed Content and Structure of the Special Report**

The proposed title and outline, with chapters, bullets of indicative content, as well as the suggested number of pages are presented in Annex I.

#### **4. Time Schedule**

A call for the nominations of experts to serve as Coordinating Lead Authors, Lead Authors and Review Editors will be issued in early April 2016, immediately following the 45th Session of the IPCC. Approval and acceptance of the Special Report is planned for the 51st Session of the IPCC in September 2019. In order to achieve this, the timetable for the Special Report is as follows:

<b>2017</b>	
7 April – 12 May	Call for author nominations
30 June	Selection of authors
2–6 October	First Lead Authors Meeting
<b>2018</b>	
12–16 February	Second Lead Authors Meeting
4 May – 29 June	Expert Review of the First Order Draft
23–27 July	Third Lead Authors Meeting
16 November – 11 January	Expert and Government Review of the Second Order Draft
<b>2019</b>	
25 February – 1 March	Fourth Lead Authors Meeting
14 June – 9 August	Final Government Distribution of the Final Draft and Final Government Review of the Summary for Policymakers
23–27 September	IPCC approval of the Summary for Policymakers and acceptance of the Special Report

## 5. Provisional Budget Estimate

The IPCC Secretariat has developed budget implications based on the proposed outline with six chapters, assuming chapter teams of about 15 authors and a maximum of 50% from developing countries (DC) and countries with economies in transition (EIT).

Activity	DC/EIT Support <sup>1</sup>	Additional Expenditure	Sub-total	Link to IPCC-XLV/Doc. 2
LA 1	180,000 45 journeys	30,600	210,600	Annex 6
LA 2	180,000 45 journeys	30,600	210,600	Annex 7
LA 3	180,000 45 journeys	30,600	210,600	Annex 7
LA4	180,000 45 journeys	30,600	210,600	Annex 8
IPCC-51 <sup>2</sup>	24,000 6 journeys	3,600	27,600	Annex 8
<b>Total</b>			<b>870,000</b>	

**Budget 2017:** assuming 1 Lead Author Meeting with 45 journeys for DC and EIT Coordinating Lead Authors, Lead Authors and Review Editors at 4,000 CHF per journey, plus 30,600 CHF for other meeting costs. A sub-total of 210,600 CHF will be needed from the IPCC Trust Fund in 2017.

**Budget 2018:** assuming 2 Lead Author Meetings with 45 journeys each of DC and EIT Coordinating Lead Authors, Lead Authors and Review Editors at 4,000 CHF per journey plus 30,600 CHF for other meeting costs. A sub-total of 421,200 CHF will be needed from the IPCC Trust fund in 2018.

<sup>1</sup> IPCC Trust Fund Programme and Budget (IPCC-XLV/Doc. 2) used a maximum of 45 DC/EIT Lead Authors and Review Editors

<sup>2</sup> This is a part of the overall budget for IPCC-51 for DC/EIT SPM Drafting Authors who will travel to the WG Session in support of the Special Report

**Budget 2019:** assuming 1 Lead Author Meeting with 45 journeys for DC and EIT Coordinating Lead Authors, Lead Authors and Review Editors at 4,000 CHF per journey, plus 30,600 CHF for other meeting costs. A sub-total of 210,600 CHF will be needed from the IPCC Trust Fund in 2019.

The overall budget for IPCC-51 includes funds for a preparatory meeting with 6 DC and EIT CLAs and their participation in the IPCC WG Session to approve the Summary for Policymakers, plus 15% additional costs, 62,100 CHF.

Costs for translation and purchasing of the Special Report, shipping costs, and outreach are included in the budget line on 'publications/translations' for 2019 and 2020.

## Outline of the Special Report on Climate Change and Oceans and the Cryosphere

Title:

**IPCC Special Report on the Ocean and Cryosphere in a Changing Climate**

**Summary for Policymakers (~10 pages)**

### **Chapter 1: Framing and Context of the Report (~15 pages)**

- Integrated storyline of the report, chapter narrative, chapter sequence and their linkages (including coverage of extremes and abrupt change and irreversible changes)
- Definition of ocean and cryosphere and their components
- Observing capacities, progress and limitations (e.g., time series and spatial coverage)
- Assessment methodologies, including indigenous and community knowledge, risk, and applications of detection and attribution
- Role of ocean and cryosphere in the climate system, including characteristics, key feedbacks and time scales
- Implications of ocean and cryosphere change for resources, natural systems (e.g., loss of habitat, extinctions) and human systems (e.g., psychological, social, political, cultural and economic aspects)
- Linkages of this report to relevant institutional and policy contexts (e.g., Paris Agreement and SDGs, Sendai Framework)
- Treatment of vulnerabilities and marginalized areas and people (e.g., gender) in this report
- Scenarios and time frames considered in this report
- Treatment of uncertainty

### **Chapter 2: High Mountain Areas (~20 pages)**

- Common drivers for changes in mountain cryosphere (glaciers, permafrost, and snow, including tropical regions) and feedbacks (e.g., CH<sub>4</sub> emissions, albedo) to regional and global climate
- Effects of a changing mountain cryosphere on natural hazards and management options for protecting lives, livelihoods, infrastructure, and ecosystems
- Impacts from changes in the mountain environment (e.g., snow cover) on habitability, community livelihoods and culture, and adaptation options
- Risks for societies that depend on mountain cryosphere for water resources (e.g., human consumption, ecosystems and agriculture) and potential response strategies (e.g., national and international water resource management and technologies)
- Impacts of variability and trends in water supply on hydropower production and implications for energy policy and water governance
- Influence of mountain cryosphere run-off on coastal systems and sea level

### **Chapter 3: Polar Regions (~50 pages)**

- Changes in atmospheric and ocean circulation that influence polar regions, including regional feedbacks and teleconnections and paleo perspectives
- Greenland and Antarctic ice sheets and ice shelves, Arctic glaciers, mass change, physics of dynamical instability and accelerated ice discharge; consequences for ocean circulation and biogeochemistry, and sea level
- Changing snow cover and thawing permafrost (terrestrial and subsea); carbon flux and climate feedbacks; impacts on infrastructure and ecosystems; community-based adaptation
- Changing sea ice; effects on climate; implications for ecosystems, coastal communities, transportation and industry
- Changing polar ocean (physical, dynamical and biogeochemical properties), implications for acidification, carbon uptake and release; impacts on ecosystems and fisheries; adaptation options (e.g., ecosystem-based management and habitat protection) and limits to adaptation
- Access to resources and ecological, institutional, social, economic, and cultural consequences of polar change, including issues of international cooperation
- Responses to enhance resilience

### **Chapter 4: Sea Level Rise and Implications for Coasts and Communities (~50 pages)**

- Observations and projections of sea level at global and regional scale, attribution to drivers, factors that influence relative sea level change, and long-term commitment and paleo perspective
- Demographic and socio-economic factors that drive vulnerability and exposure to sea level rise
- Current and future sea level rise risks resulting in biophysical, ecological, economic, political, cultural, social and psychological impacts
- Implications of sea level rise for highly vulnerable coastal zones, particularly SIDS, coastal cities and infrastructure, deltas and low-elevation areas
- Pathways to resilience and sustainable development: measures, safety margins, barriers and enablers

## **Chapter 5: Changing Ocean, Marine Ecosystems, and Dependent Communities (~65 pages)**

- Changes in key physical and biogeochemical properties and processes, including the deep ocean, their feedbacks on the climate system
- Specific and combined effects of changes in climate related variables (e.g., warming, acidification, and oxygen loss) on e.g., species distribution and exclusion, habitat compression, food webs
- Impacts of ecosystem changes on key ecosystem services (e.g., carbon uptake, biodiversity, coastal protection, food security and tourism)
- Degradation in benthic habitat (e.g., storm-driven) and improved resilience through conservation and restoration
- Interactions of climate and non-climatic drivers (e.g., pollution, fishing practices, resource extraction, habitat changes); impacts on marine environments, ecosystems, and human health
- Blue carbon, nature-based solutions, and ocean implications of different mitigation measures
- Climate change impacts and trade-offs in ocean economies and governance across all scales
- Adaptation options for marine ecosystem dependent communities and their livelihoods

## **Chapter 6: Extremes, Abrupt Changes and Managing Risks (~20 pages)**

- Risks of abrupt change in ocean circulation and cryosphere and potential consequences
- Extreme ENSO events and other modes of variability and their implications
- Marine heat waves and implications
- Changes in tracks, intensity, and frequency of tropical storms and associated wave height
- Cascading risks, irreversibility, and tipping points
- Monitoring systems for extremes, early warning and forecasting systems in the context of climate change
- Risk management, including disaster risk reduction and enhancing resilience

## **Case Studies, Frequently Asked Questions and Boxes (~20 pages)**

### **Cross-Chapter Box: Low Lying Islands and Coasts (up to 5 pages)**

- Key climate drivers and changes relevant for low lying islands and low lying coastal areas
- Impacts and cascading risks of climate driven changes (e.g., sea level rise, ocean circulation, extreme events), interacting with other drivers, on habitability, infrastructure, communities, livelihoods, loss of lives and assets and territories, infrastructure, ecosystems, coral reefs, access to resources, and on institutional, social, economic, and cultural aspects
- Resilience pathways and adaptation options and their limits to address these changes