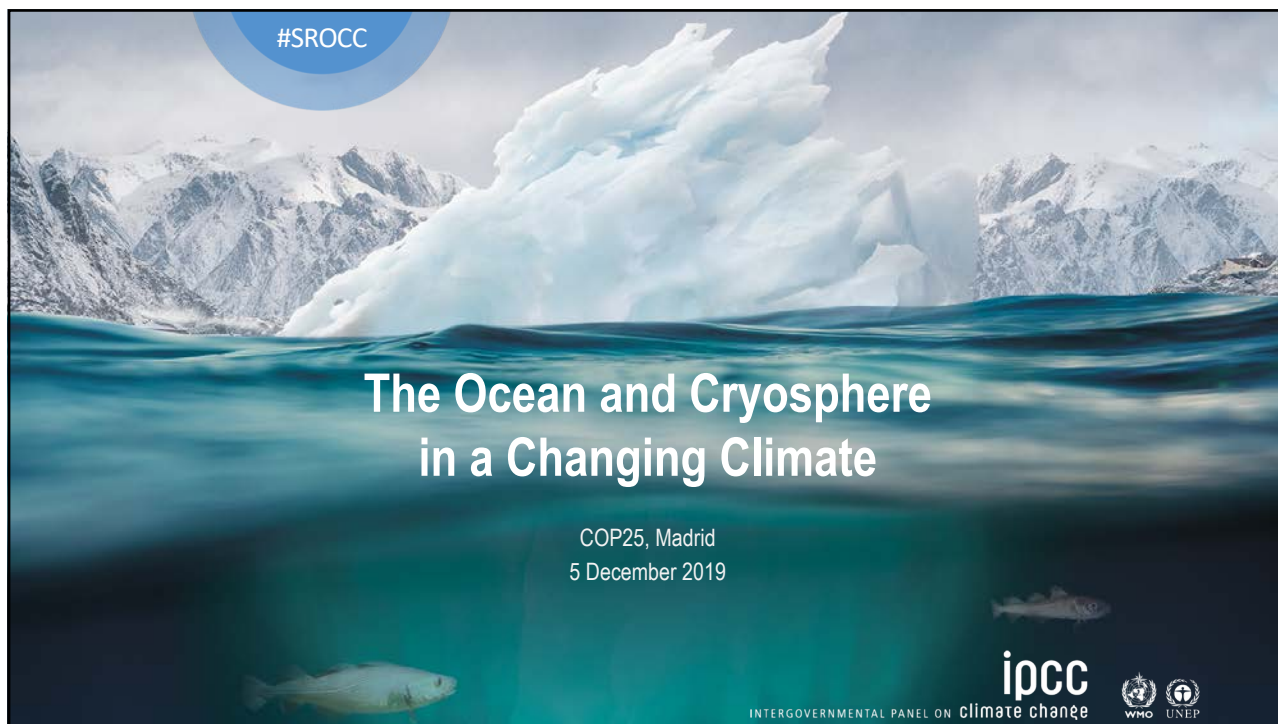
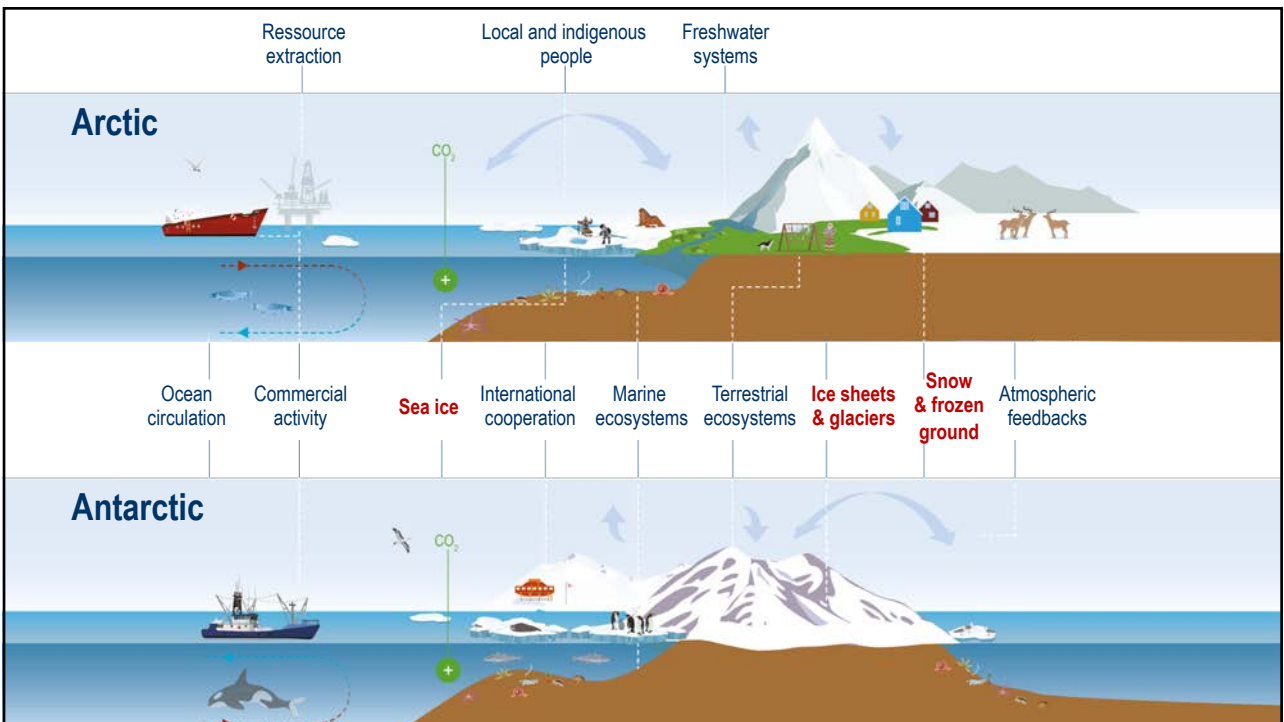
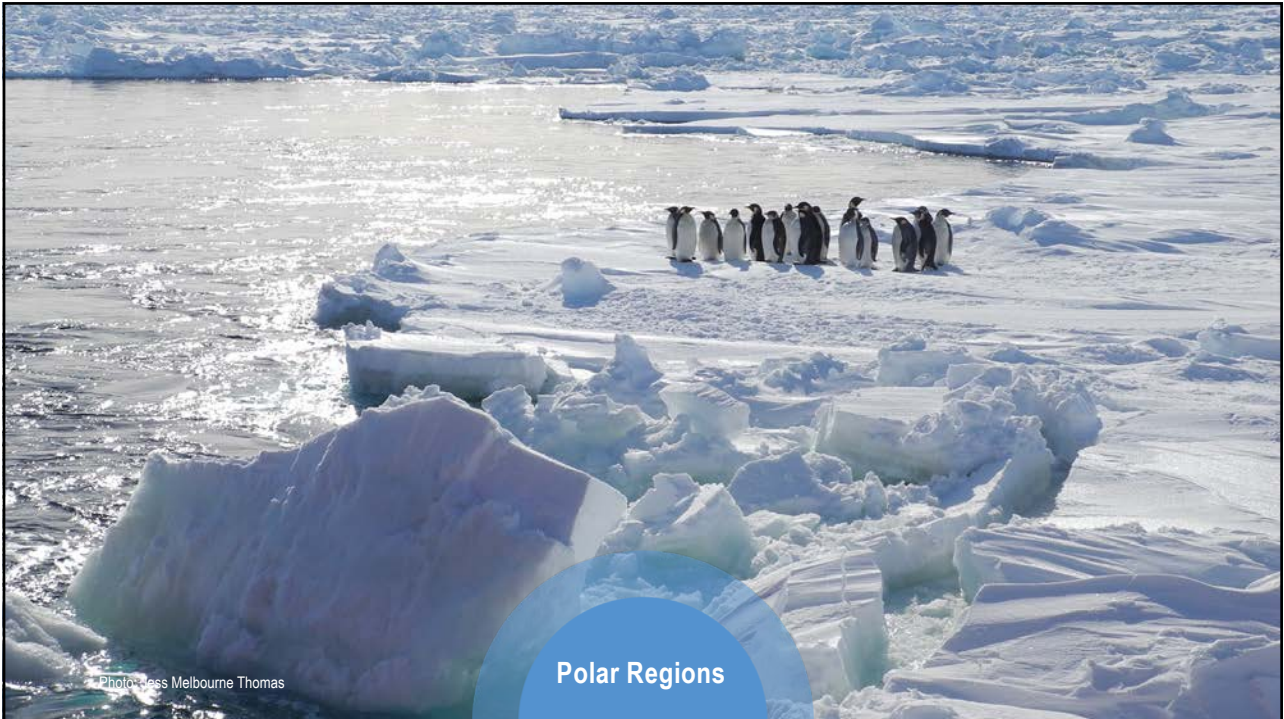


SBSTA-IPCC special event: Unpacking the new scientific knowledge and key findings in the Special Report on the Ocean and Cryosphere in a Changing Climate



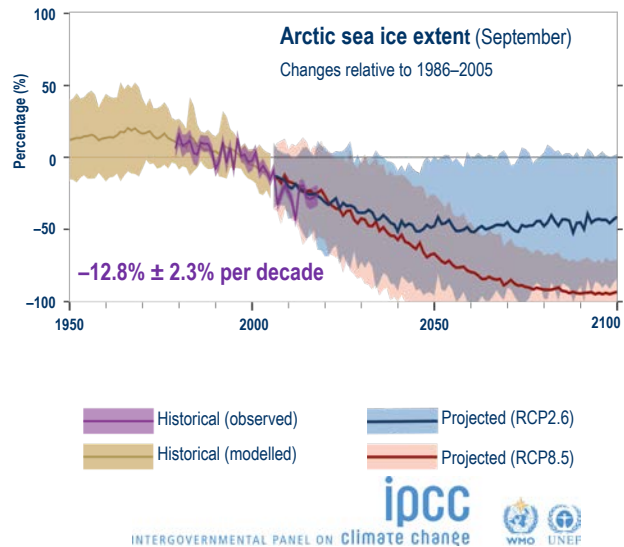
SBSTA-IPCC special event: Unpacking the new scientific knowledge and key findings in the Special Report on the Ocean and Cryosphere in a Changing Climate





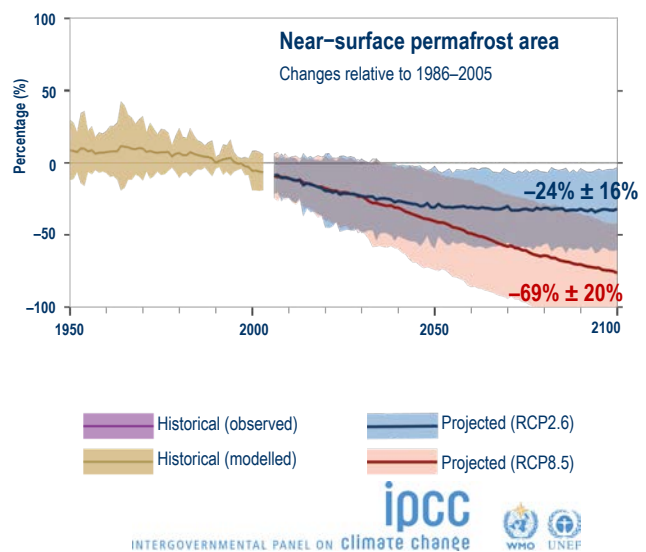
## Arctic sea ice is shrinking and its loss is projected to continue depending on global warming

- September **Arctic sea ice extent has decreased** between 1979 and 2018
- Summertime Arctic **ship-based transportation has increased** over the past two decades
- At global warming of **1.5°C**, the **Arctic Ocean will rarely be free of sea ice in September**.
- At **2°C** warming, this would occur on average in **one to three times in ten years**



## Arctic permafrost is warming, and widespread thaw is projected this century

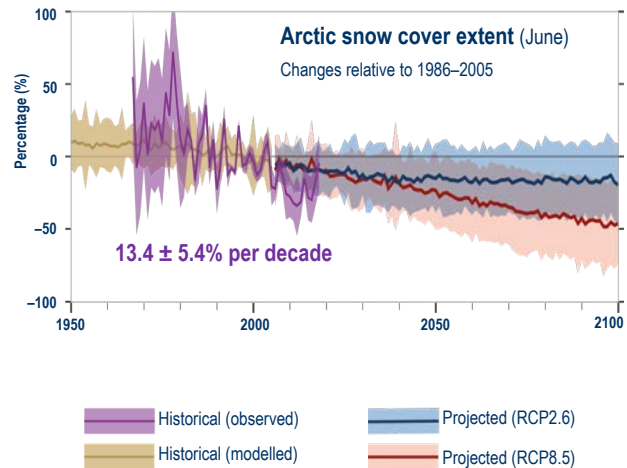
- **Permafrost temperatures** have increased to **record high levels**
- **Widespread permafrost thaw** is projected for **this century**
- Arctic and boreal permafrost contain **almost twice the carbon** in the atmosphere
- It is **uncertain** whether northern permafrost regions are currently **releasing additional net methane and CO<sub>2</sub>**



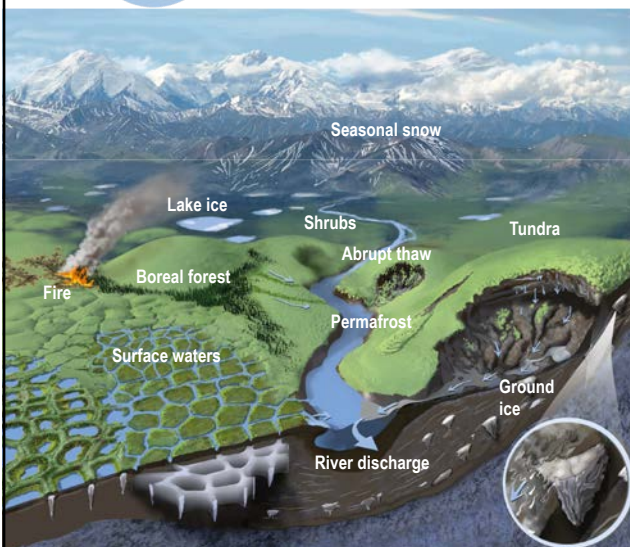


## Arctic spring snow cover extent has decreased and is projected to decrease further

- Arctic June **snow cover** has **declined** since 1967
- **Feedbacks** from the loss of spring snow cover and summer sea ice have contributed to **amplified Arctic warming**
- **Strong reductions in greenhouse gas emissions** in the coming decades are projected to **reduce further changes** after 2050



## Shrinking Arctic cryosphere affects water, wildfire, ecosystems, human activities and infrastructure

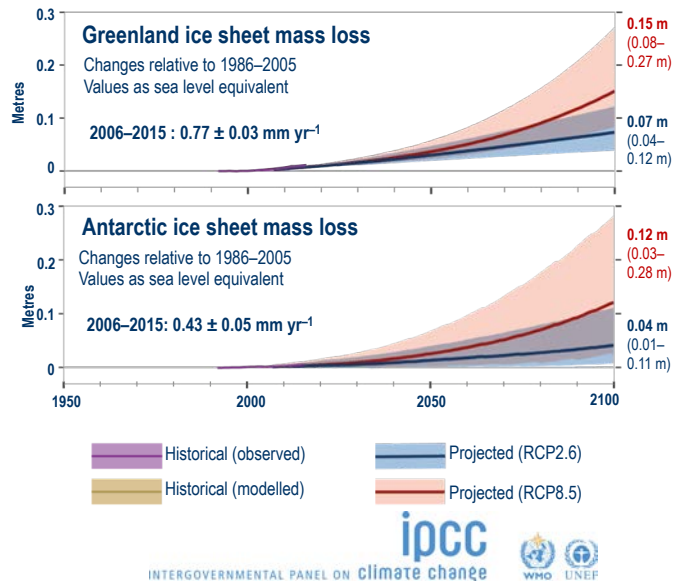


- **Food and water security** have been **negatively impacted** by changes in cryosphere in many Arctic regions
- About 20% of Arctic land permafrost is vulnerable to **abrupt permafrost thaw and ground subsidence**
- The majority of **Arctic infrastructure** is located in regions **at risk** from permafrost thaw by 2050



## The Greenland and Antarctic ice sheets are losing mass

- **Mass loss from the Antarctic ice sheet** over the period 2007–2016 **tripled** relative to 1997–2006
- For **Greenland**, mass loss **doubled** over the same period
- **Acceleration of ice flow** is observed in the Amundsen Sea Embayment of West Antarctica and in Wilkes Land, East Antarctica
- Ice sheets are projected to **lose mass** at an **increasing rate**



The polar regions will be profoundly different in future compared with today, and the degree and nature of that difference will depend strongly on the rate and level of global warming.

This will challenge adaptation responses regionally and worldwide.



## Global mean sea level is rising

### Rates of global mean sea level rise 2006–2015

3.6mm/yr (range 3.1–4.1)

Of which :

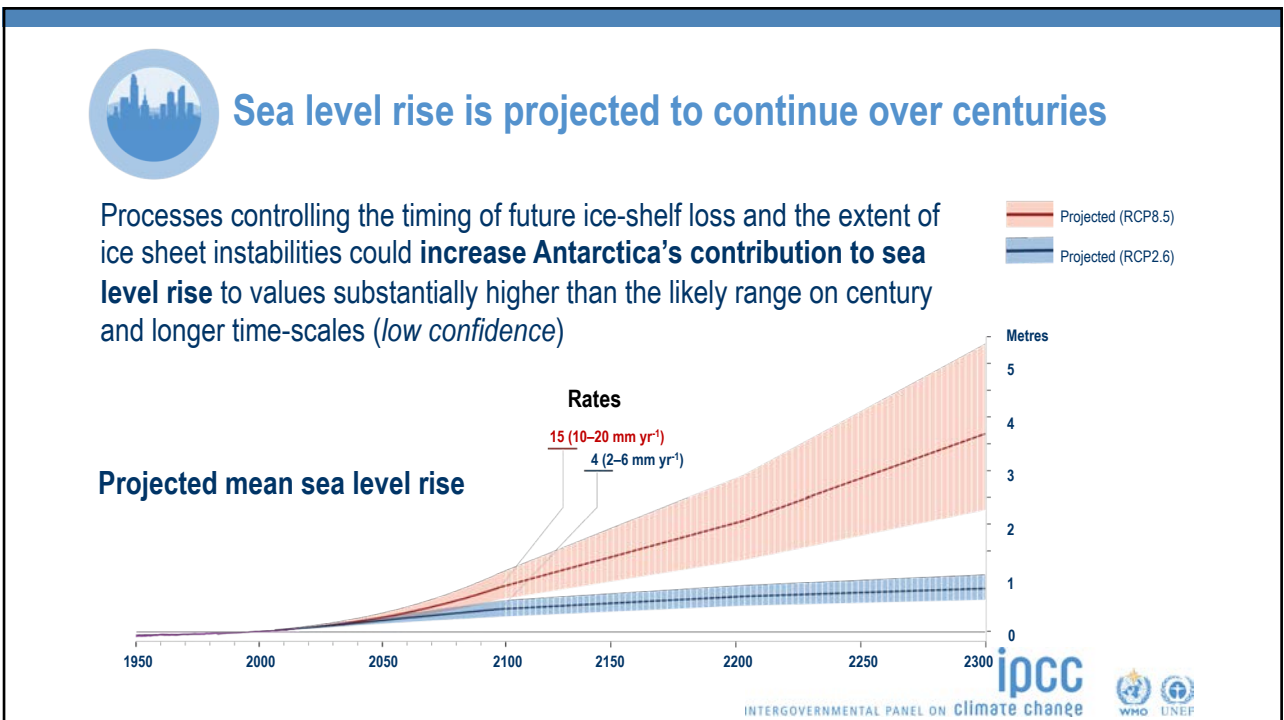
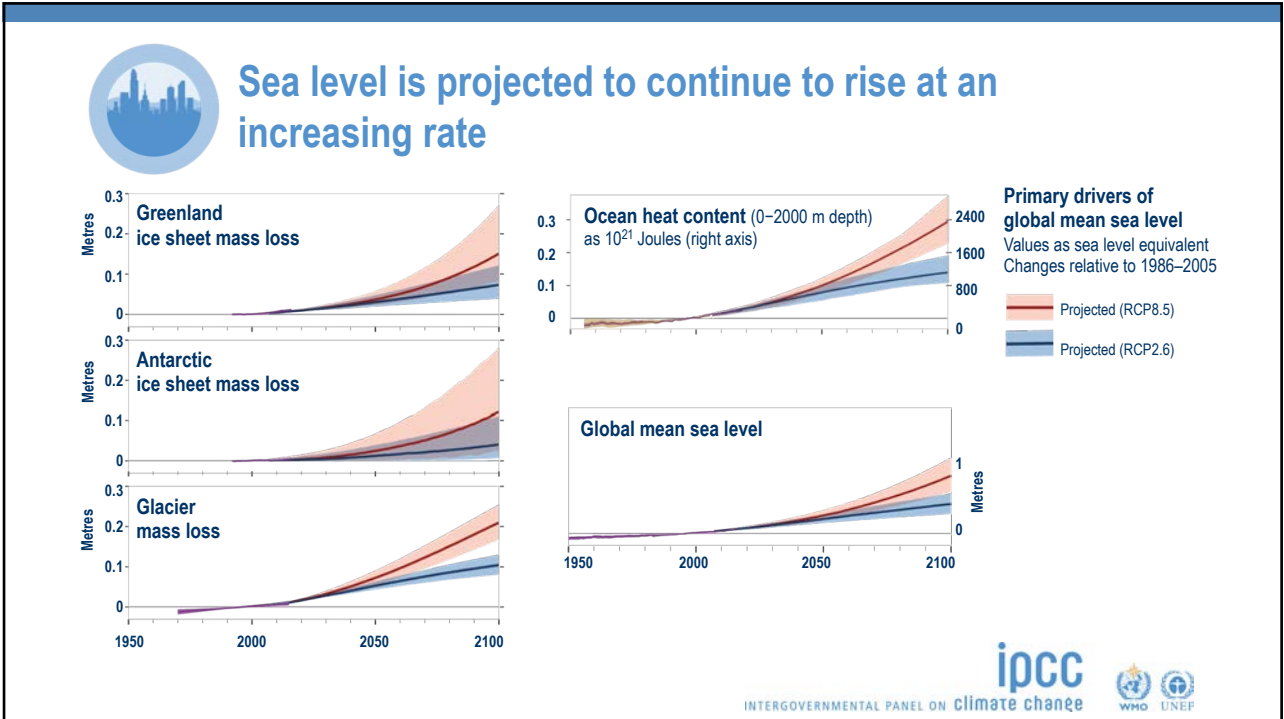
#### Glaciers and ice sheets

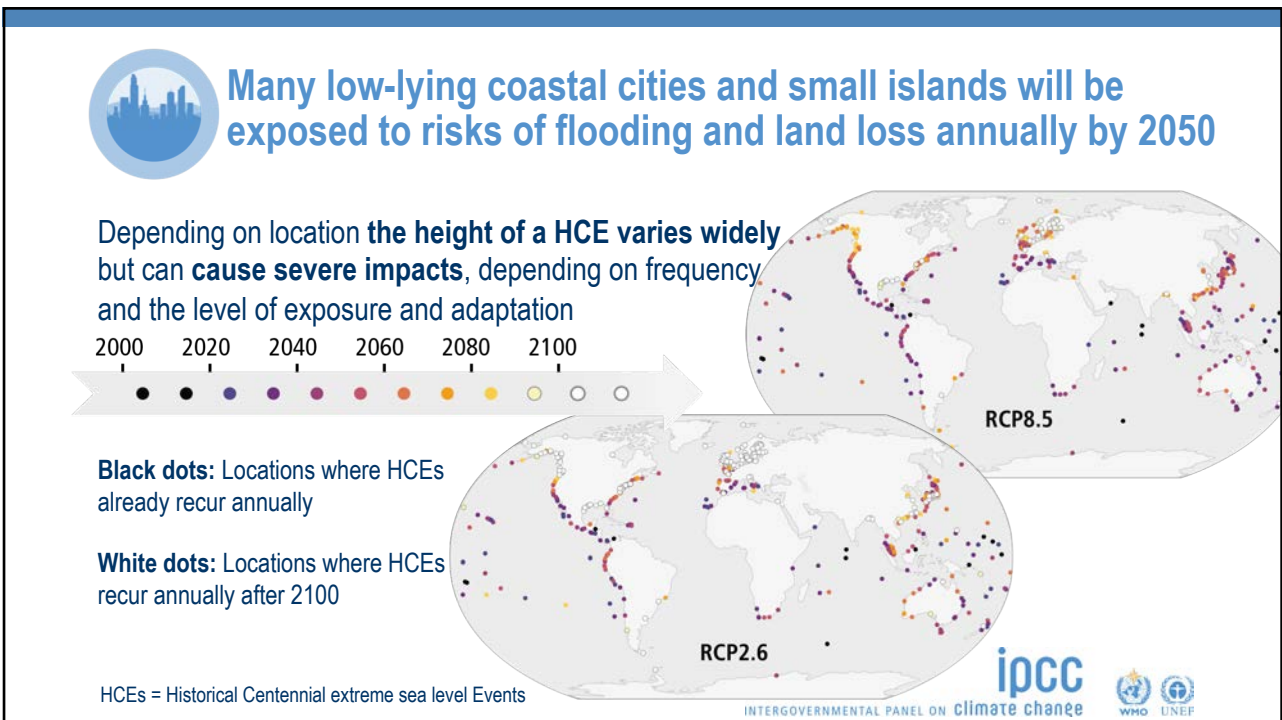
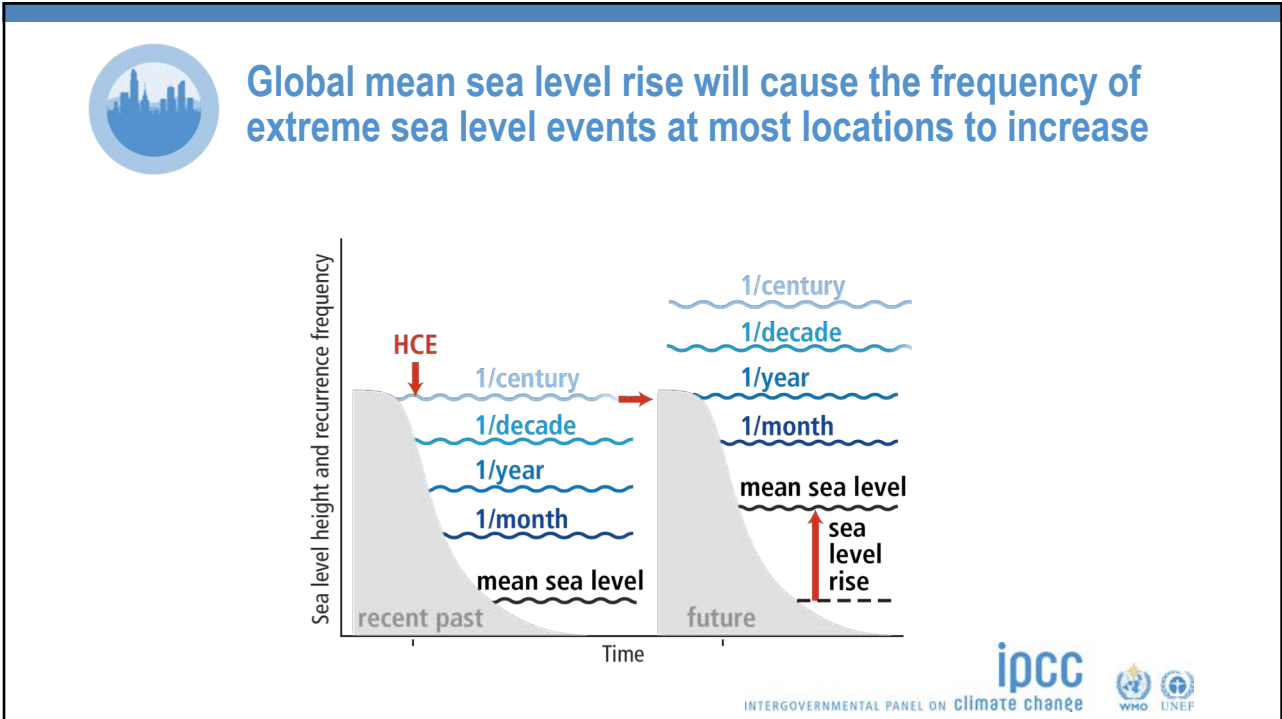
1.8mm/yr (range 1.7–1.9)

#### Ocean

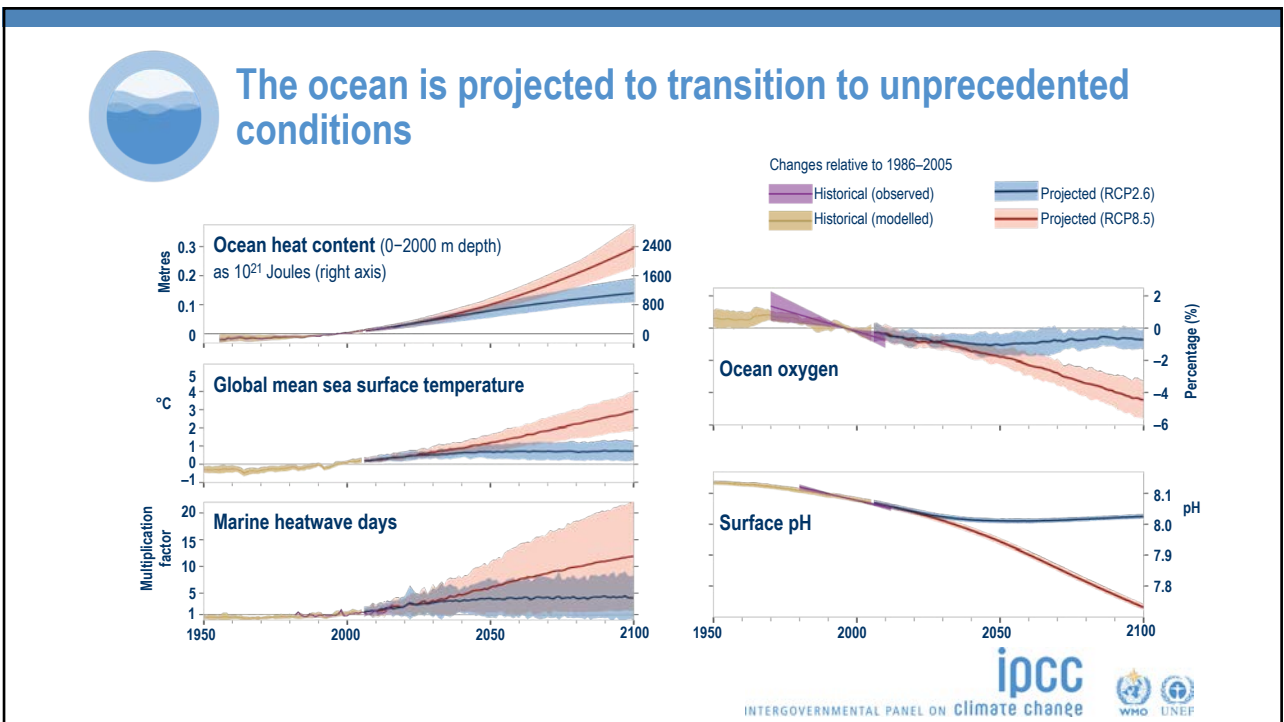
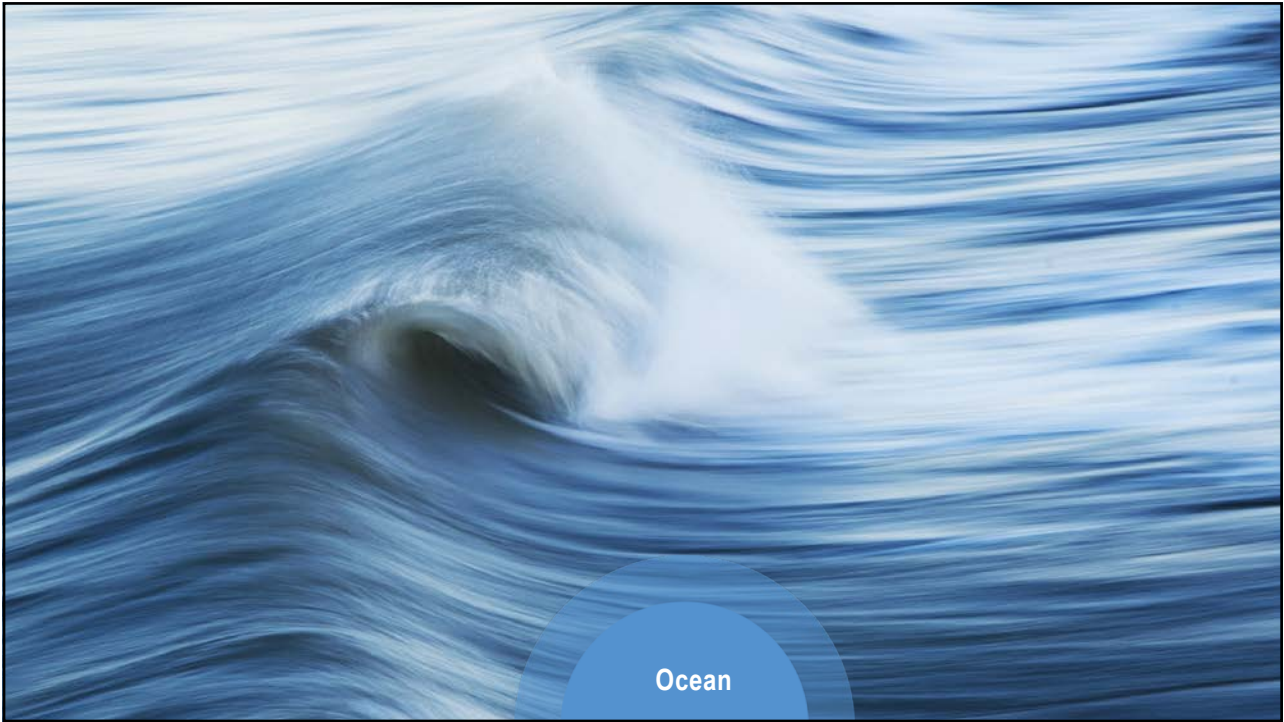
1.4mm/yr (range 1.1–1.7)

- It has **accelerated** in recent decades due to mass loss from the Greenland and Antarctic ice sheets, as well as continued glacier mass loss and ocean thermal expansion
- **Regional differences**, within  $\pm 30\%$  of the global mean sea-level rise, result from land ice loss and variations in ocean warming and circulation
- **Extreme wave heights**, which contribute to extreme sea level events, have **increased** in the Southern and North Atlantic Oceans
- Anthropogenic climate change has **increased precipitation, winds, and extreme sea level events**, associated with some **tropical cyclones**









**Our ocean and cryosphere –  
They sustain us.  
They are under pressure.  
Their changes affect all our lives.**

**The time for action is now.**

**More Information:**

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