Our oceans, our climate, our survival

Key takeaways from the IPCC Special Report on Ocean and Cryosphere (IPCC SROCC)

25 September 2019

The Intergovernmental Panel on Climate Change (IPCC) launch their Special Report on the Ocean and Cryosphere in a Changing Climate (SROCC) on the 25th of September at 11am CEST.

The SROCC elevates and amplifies the science of climate change. It evaluates how climate change is impacting our oceans and the cryosphere (areas of frozen water and land in the icy polar or high-mountain regions) and incorporates vulnerability assessments and adaptation limits according to different scenarios.

Key messages

- Changes to the ocean and the cryosphere (frozen regions) are happening at a faster and more extensive scale than ever. Due to the complexity of the ocean and frozen systems, there is slow onset of impact which may be unprecedented and irreversible
- The World's frozen areas are shrinking in all assessed regions. This includes ice sheets, glaciers, snow cover, and permafrost.
- Permafrost melt under high emission scenario[1] may release tens to hundred billions of tons of CO_2 and methane into the atmosphere, exacerbating the climate crisis
- Oceans are getting warmer, more acidic and more oxygen depleted, threatening life in many ecosystems and the communities who rely on them. Also, extreme events and sea level rise exacerbate risks for human communities.
- Climate stressors on our oceans can be reduced through ocean protection measures

In detail…

Oceans

- **Global warming is heating up our oceans**.
  Oceans have taken up more than 90% of the excess heat of our climate system, leading to likely more than doubling of ocean warming rate[2] and very

1 RCP 8.5

2 Since 1993

GREENPEACE

International

likely doubling of marine heatwave frequency[3]. Oceans are projected to continue getting warmer. [A2, A2.1, A2.3, SPM B2]

- **Anthropogenic CO2 emissions cause chemical changes to the oceans.** Oceans have very likely taken up 20 - 30% of total CO_2 emissions from human activities[4], changing the surface ocean pH very likely beyond natural variability for more than 95% of the ocean surface area. Ocean acidification is virtually certain to continue and exacerbate by 2100, elevating risks for aragonite shelf forming species in the Polar and sub-Polar Oceans by 2081–2100 under high emission scenario[5]. [A2, A2.5, SPM B2, B2.3, Figure SPM 1, Figure SPM 2]
- **Oceans are projected to transition to unprecedented conditions**, with increased temperatures, further acidification and oxygen decline occurring over the 21st century. [B2]
- **As a result of ice loss from Greenland and Antarctic ice sheets and ocean warming, the global mean sea level is rising, in an unprecedented rate[6] for 2006-2015 - and sea level rise since 1970 is mainly because of anthropogenic emissions.** By the end of the century 1.6 ℃ [7] mean global warming could cause about half a metre of global mean sea level rise can be expected. With mean warming of 4.3 ℃ [8] it will reach about 1 m by 2100 and over 3.5 m by 2300. Unless adaptation measures are improved, annual coastal flood damages will increase 2-3 order of magnitude by the end of the century compared to today [A3, A3.1, A3.2, B3.1, B9.1, Figure SPM 1]
- **Unprecedented[9] climate conditions are developing in the ocean. Prior to 2100, over 60% of ocean area are projected to have the emergence of 5 primary ecosystem change drivers[10] under the high emission pathway[11].** Increased precipitation, wind and extreme sea level events associated with some tropical cyclones have increased due to climate change. Projected increases in tropical cyclone intensity and precipitation will exacerbate extreme sea levels and coastal hazards. [A3, A 3.6, B2.4]
- **Extreme El Niño events are projected to likely occur about twice as often in the 21st century[12].** [A3.6, B2.4, B2.6, B3, B3.6, SPM Figure 3]
- **Maximum catch potential of fisheries is projected to decrease by almost a quarter by the end of the 21st century (relative to 1986 - 2005) under high emission scenario13.** This will contribute to elevating the risk for income,

3 Since 1982

4 Since 1980s
5 RCP 8.5
6 Over the last century
7 RCP 2.6, likely range of 0.9 to 2.4℃ end of century (2081 - 2100)
8 RCP 2.6, likely range of 0.9 to 2.4℃ end of century (2081 - 2100)
9 Since pre-industrial times
10 surface warming and acidification, oxygen loss, nitrate content and net primary production change
11 RCP 8.5
12 Compared to the 20th century
13 Compared to the 20th century

GREENPEACE
International

livelihoods and food security of coastal communities worldwide. [B5.1, SPM B8, B8.1]

Frozen regions

- **Between 2007-2016, Antarctic ice sheets mass loss has tripled and Greenland ice mass loss has doubled compared to 10 years previous. Observed acceleration of ice flow and retreat in Antarctica** may be the beginning of an irreversible trend of ice sheet instability with recovery timescale of hundreds or thousands of years. [A3.2 and 3.3]

- **Permafrost temperature have increased to record high levels**[14]. This is concerning because Arctic and boreal permafrost contain 1460 -1600 Gt organic carbon, which is **almost twice the carbon in the atmosphere**. High emission scenario[15] leads to the cumulative release of tens to hundreds of billions of tons (GtC) of permafrost carbon as CO2 and methane to the atmosphere by 2100 with potential to exacerbate climate change. [B1.4]

- **Arctic Sea ice reduction in September due to global warming is likely to be unprecedented**[16]. Many glaciers are projected to disappear regardless of future emissions and Arctic sea ice loss will continue through mid-century beyond with differences thereafter depending on the magnitude of global warming. [A1.4, B1.1, B1.7]

Solutions

- **Reducing stressors to our oceans and ice regions through protection, restoration, precautionary ecosystem-based management of renewable resources use, and reduced pollution.** Solutions include establishing networks of protected areas and improved protection and management of coastal blue carbon[17] ecosystems. [C2, C2.1**,** SPM C2.4**]**

- **Intensifying cooperation and coordination among governing authorities across scales, jurisdictions, sectors, policy domains and planning horizons can enable resilience and effective responses to changes in the ocean, cryosphere and to sea level rise.** [C4, C4.2]

- **Enabling climate resilience and sustainable development depends critically on urgent and ambitious emission reduction with adaptation actions.** Early and ambitious mitigation creates co-benefits while delayed action leads to escalating costs through negative impacts to the ocean and cryosphere. [C4.1, C4.7]

What does it mean?

This report provides scientific evidence that confirms our worst fears – the climate crisis is an oceans crisis. The impacts of climate breakdown and human exploitation on our oceans are chronic and in some cases irreversible. They are pushing our blue planet to the verge of collapse.

Healthy oceans play a vital role in mitigating the impacts of climate breakdown and sustaining life on our planet. It's vital to preserve the biodiversity and build the

14 1980s - present

15 RCP 8.5

16 In past millennium

17 IPCC SROCC Glossary provides definition to blue carbon

resilience of our oceans so they are better able to withstand the climate crisis. This includes protecting areas where 'blue carbon' is stored in huge volumes, like in the soil of a mangrove forest or the deep ocean seabed.

Governments must act with urgency to protect our oceans and agree a strong Global Ocean Treaty in 2020. This could lead to the creation of a network of ocean sanctuaries, placing at least 30% of our oceans off-limits to human activities by 2030. It is critical that senior political leaders participate in the final round of negotiations for the Global Ocean Treaty to ensure a strong treaty that places protection ahead of exploitation.

Governments must accelerate climate action now and be more ambitious in their efforts to limit global warming to 1.5 °C, half their carbon emissions by 2030 and get to carbon neutrality by 2050. They must do more to tackle the root causes of climate breakdown and transform their energy systems away from polluting fossil fuels to 100% renewable energy.

Ocean Protection is Climate Action.

For more information, contact:

Greenpeace CEE
Fernkorngasse 10
1100 Wien, Austria

Jasmin Duregger
Climate and Energy Campaigner
Tel: (+43) 664 840 3803
Email: jasmin.duregger@greenpeace.org

Greenpeace International
Ottho Heldringstraat 5
1066 AZ Amsterdam
The Netherlands

enquiries@greenpeace.org
Tel: +31 20 7182000

GREENPEACE

International