

Human Healthcare, the Ocean and our future

“Anything else you’re interested in is not going to happen if
you can’t breathe the air and drink the water”

Carl Sagan



“We believe **healthy natural systems including oceans** offer the planet and its inhabitants the **best solution to the climate, pollution and nature emergency** and will improve the health and wellbeing of all global citizens”

The Ocean

- Covers 71% earth's surface
- Contains 97% earth's water
- Provides 99% of living space
- Homes 80% of living organisms
- Stores 40 trillion tonnes carbon
- Produces at least 50% of oxygen
- Absorbs 90% of planet's excess heat
- Absorbs over 25% of CO₂
- Is *not* too big to fail



“How inappropriate to call this planet Earth when it is quite clearly Ocean”

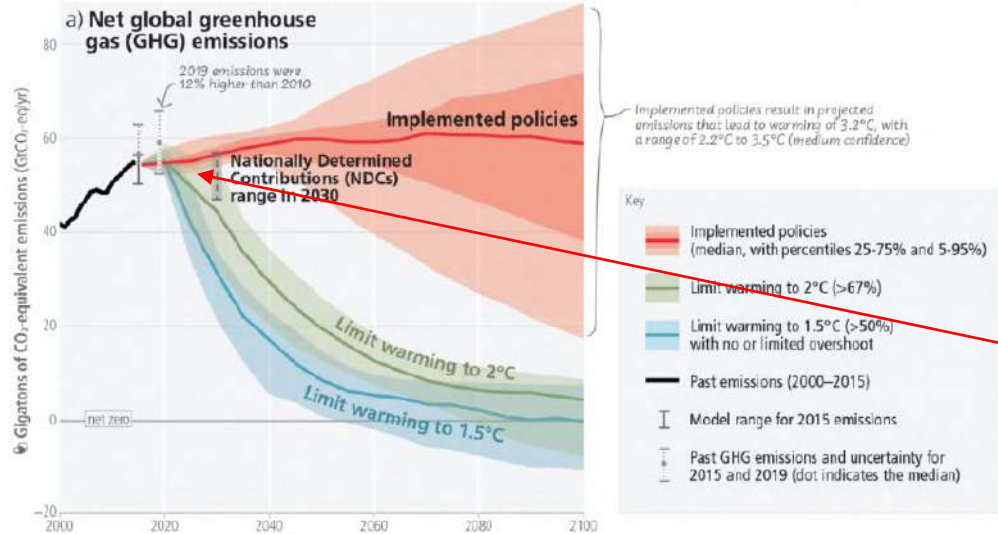
Arthur C. Clarke

SYNTHESIS REPORT OF THE IPCC SIXTH ASSESSMENT REPORT (AR6)

Summary for Policymakers

Limiting warming to 1.5°C and 2°C involves rapid, deep and in most cases immediate greenhouse gas emission reductions

Net zero CO₂ and net zero GHG emissions can be achieved through strong reductions across all sectors



Category in WGIII	Category description	GHG emissions scenarios (SSPx-y*) in WGI & WGII
C1	limit warming to 1.5°C (>50%) with no or limited overshoot***	Very low (SSP1-1.9)
C2	return warming to 1.5°C (>50%) after a high overshoot***	
C3	limit warming to 2°C (>67%)	Low (SSP1-2.6)
C4	limit warming to 2°C (>50%)	
C5	limit warming to 2.5°C (>50%)	
C6	limit warming to 3°C (>50%)	Intermediate (SSP2-4.5)
C7	limit warming to 4°C (>50%)	High (SSP3-7.0)
C8	exceed warming of 4°C (>50%)	Very high (SSP5-8.5)

Without a strengthening of policies, global warming of **3.2 [2.2–3.5] °C is projected by 2100** (medium confidence)”

“**Policies** implemented by the end of 2020 are projected to result in higher global GHG emissions in 2030 than emissions implied by **Nationally Determined Contributions**, indicating an ‘**implementation gap**’ (high confidence)”

Past and future changes in the ocean and cryosphere

Historical changes (observed and modelled) and projections under RCP2.6 and RCP8.5 for key indicators

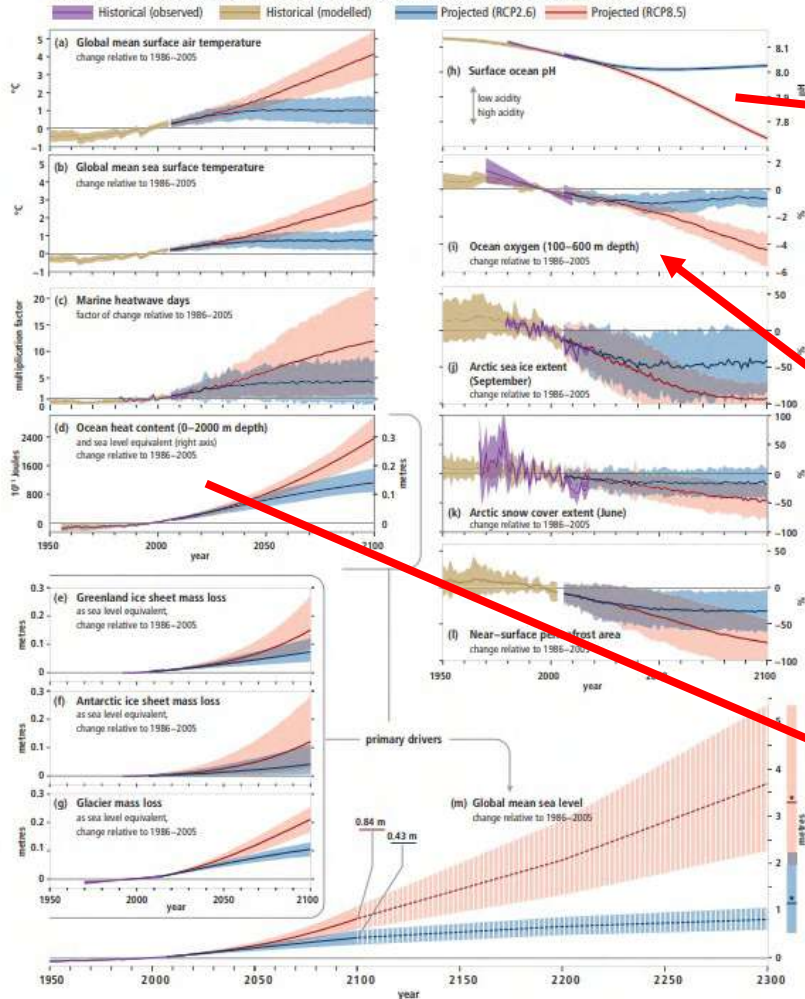
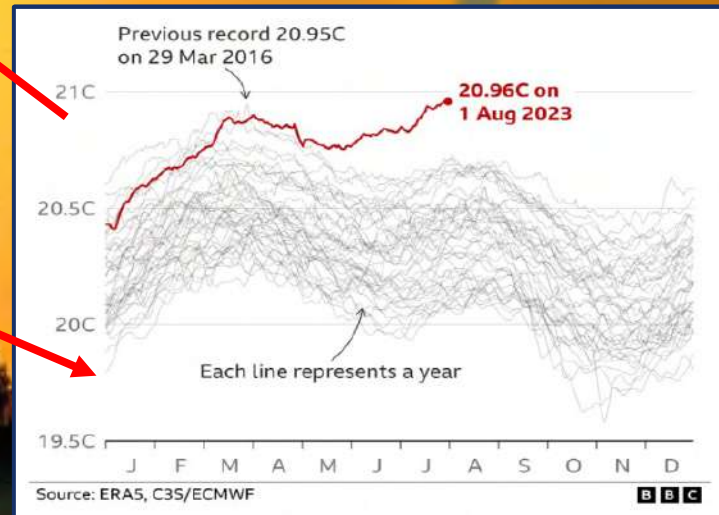
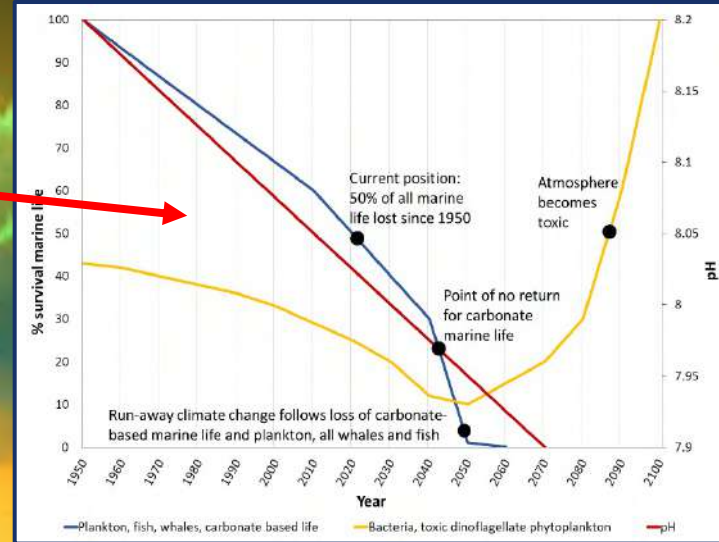
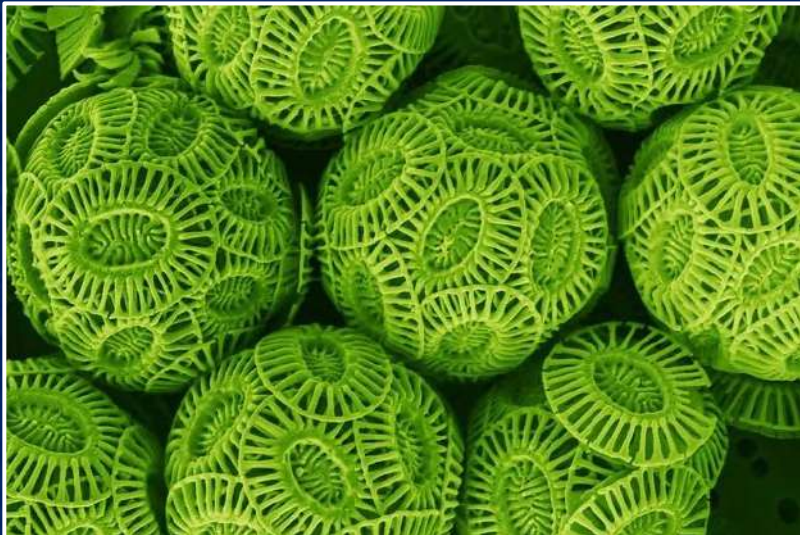
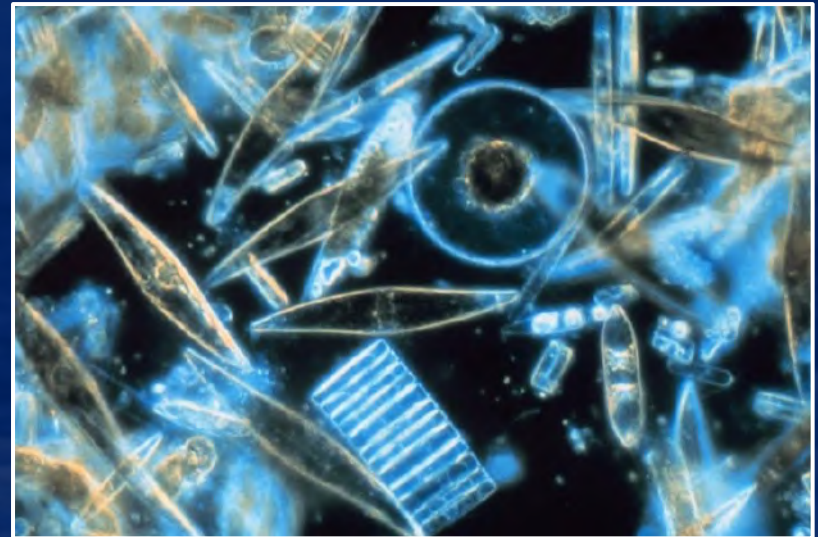
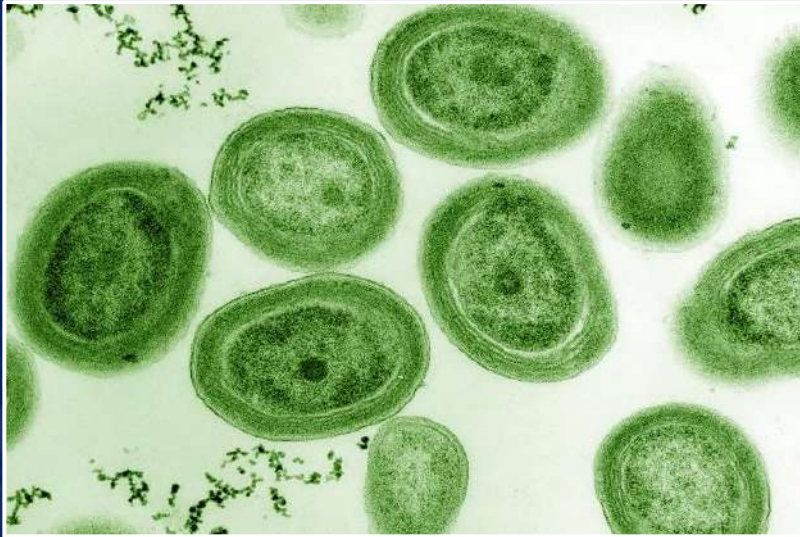


Figure SPM.1 | Observed and modelled historical changes in the ocean and cryosphere since 1950¹¹, and projected future changes under low (RCP2.6) and high (RCP8.5) greenhouse gas emissions scenarios. [Box SPM.1]



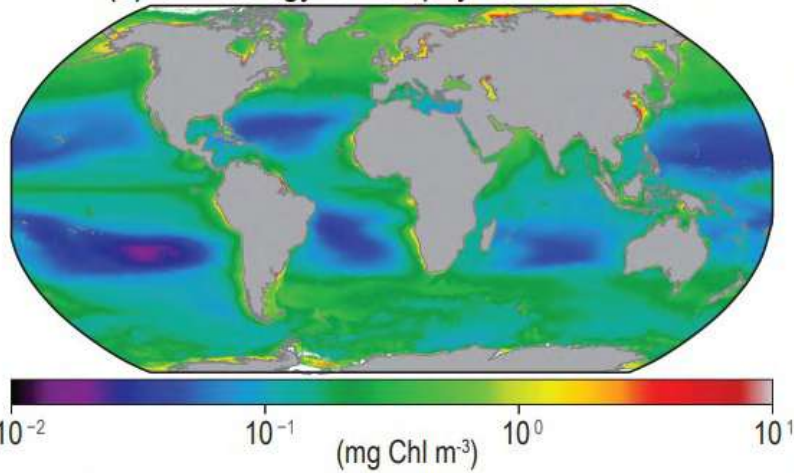


Primary production:

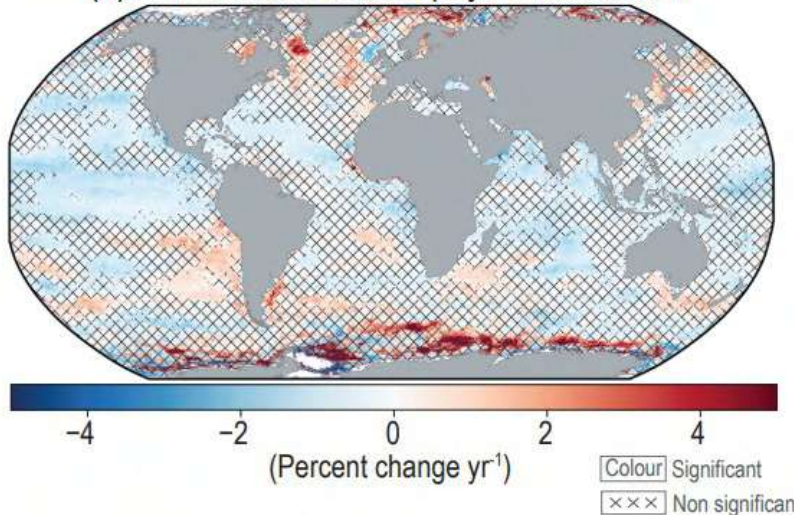
- Produces **oxygen**
- Supports most marine **food** webs and fisheries production
- Fixes **CO₂** and is the basis of the biological carbon pump

Phytoplankton dynamics in the ocean

(a) Climatology: Chlorophyll concentration

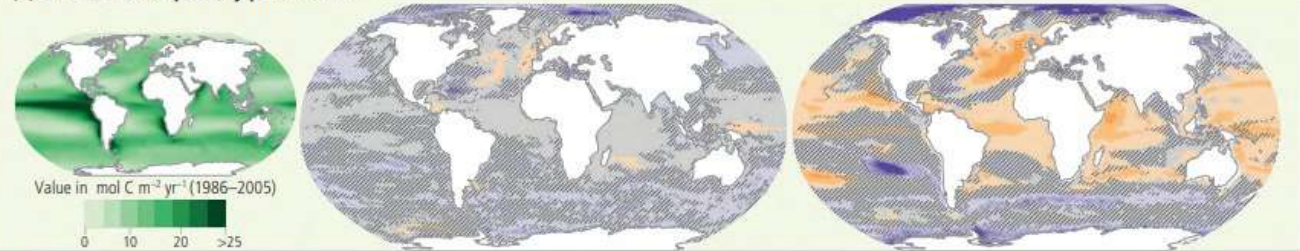


(b) Linear trends: Chlorophyll concentration



Projected changes, impacts and risks for ocean ecosystems as a result of climate change

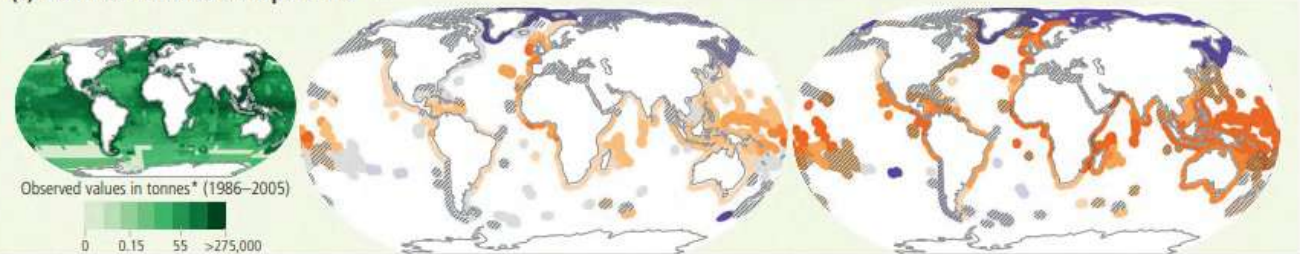
(a) Simulated net primary production



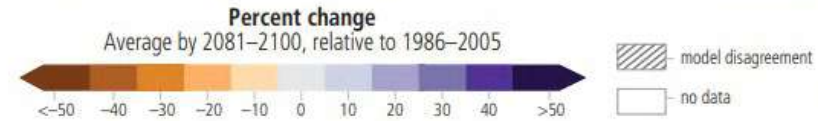
(b) Simulated total animal biomass



(c) Maximum fisheries catch potential



* See figure caption for details





What's at risk?

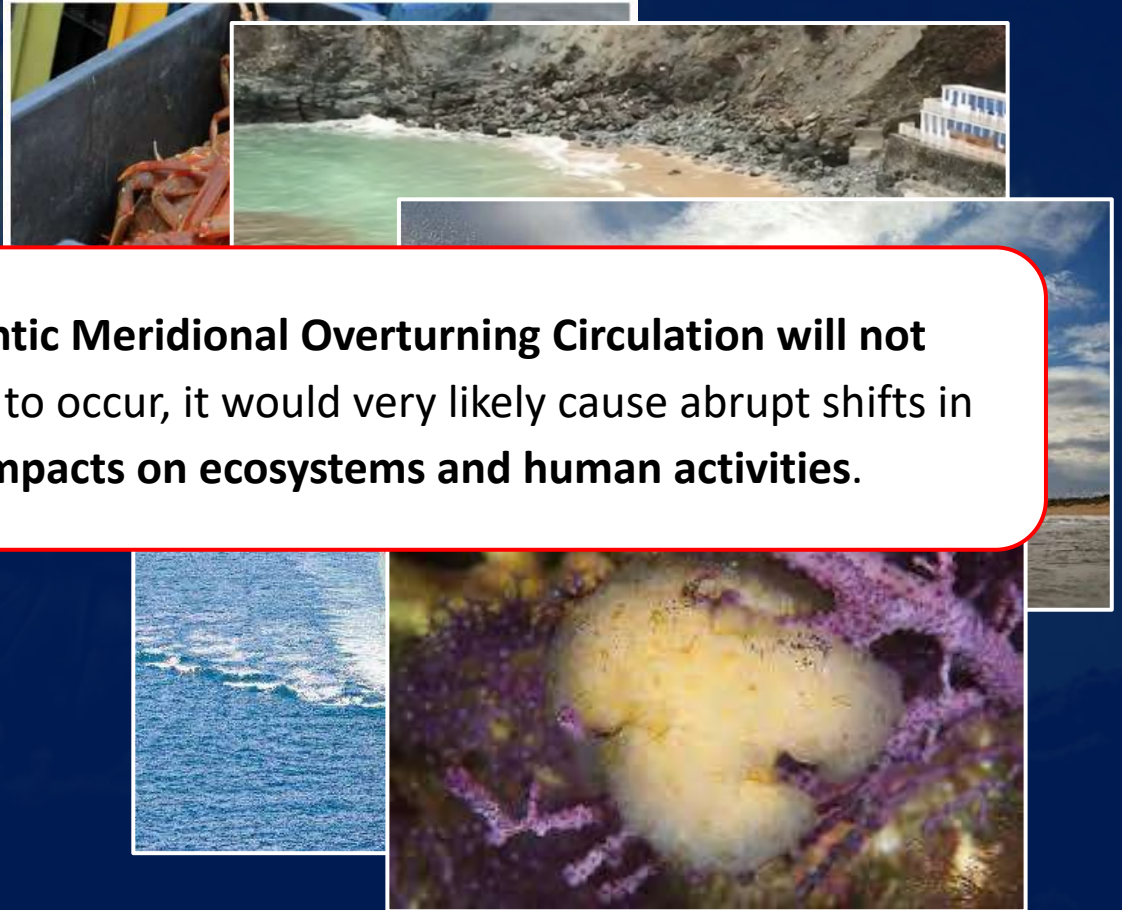
- Carbon sequestration
- Food security

There is *medium confidence* that the **Atlantic Meridional Overturning Circulation will not collapse** abruptly before 2100, but if it were to occur, it would very likely cause abrupt shifts in regional weather patterns, and **large impacts on ecosystems and human activities.**

- Supply chains and economic growth
- Discovery of new medicines
- Climate regulation

Alaska cancels snow crab season over population decline

Causes being researched but likely included increased predation and stresses from warmer water





Oceans of hope!

1 billion tonnes of photosynthesising biomass turnover every 8 days

Falkowski, Nature 2012
IPCC AR6 Synthesis Report 2023

“Carbon dioxide removal (CDR) will be necessary to achieve net-negative CO₂ emissions”

IPCC AR6 Synthesis Report 2023 p20

“By absorbing carbon, phytoplankton are our greatest ally in combatting climate change”

David Attenborough 2021

Global goal 14

1. Reduce marine **pollution**
2. Protect and restore **ecosystems (nature)**
3. Reduce ocean **acidification (CO₂)**
4. Sustainable fishing
5. Conserve coastal and marine areas
6. End subsidies contributing to overfishing
7. Increase the economic benefits from sustainable use of marine resources
8. Increase scientific knowledge, research and technology for ocean health
9. Support small scale fisheries
- A. Implement and enforce international sea law



DECADE OUTCOMES

'THE OCEAN WE WANT'



A clean ocean



A healthy and resilient ocean



A productive ocean



A predicted ocean



A safe ocean



An accessible ocean



An inspiring and engaging ocean



