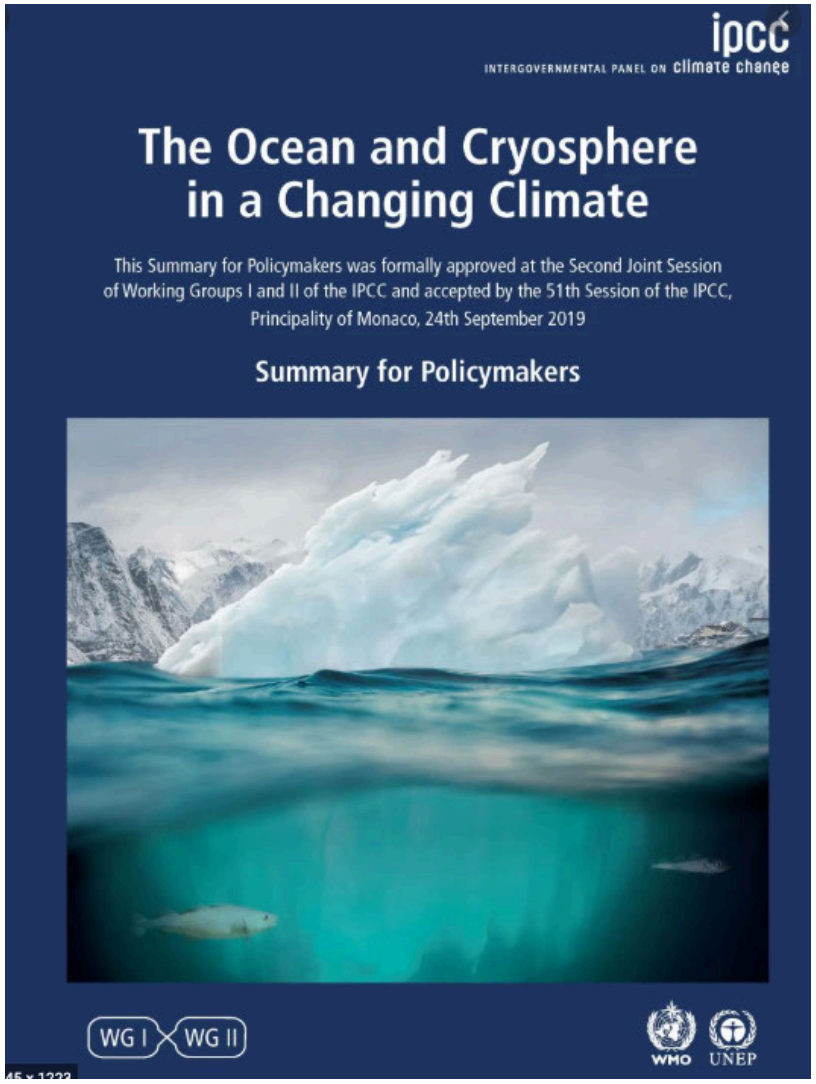

HELSINGIN YLIOPISTO
HELSINGFORS UNIVERSITET
UNIVERSITY OF HELSINKI
Stockholms universitet
Climate effects in the Baltic Sea
Links between biodiversity and carbon sequestration
From victim to solution
Christoph Humborg

# IPCC SROCC. A clarion wake up call




**Climate change makes the ocean:**

- higher
- warmer
- more acidic
- see heat waves
- hold less oxygen
- less productive
- less predictable

Jane Lubchenco, AUG 2020

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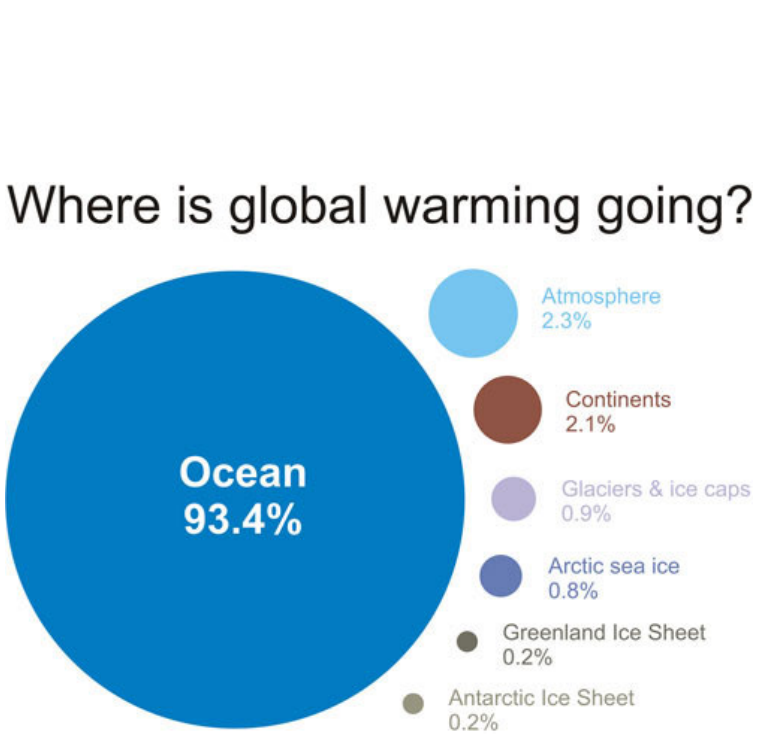
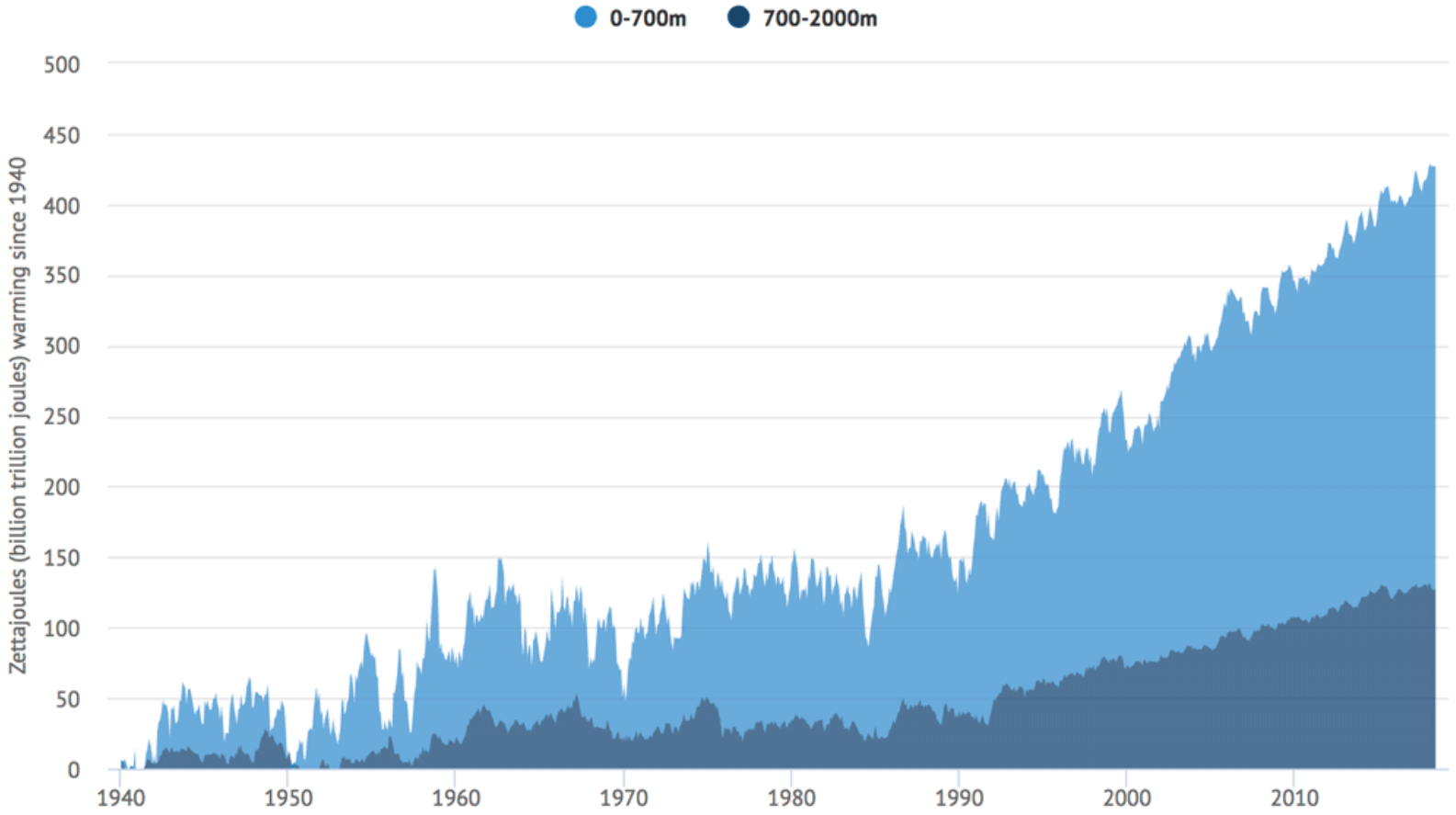
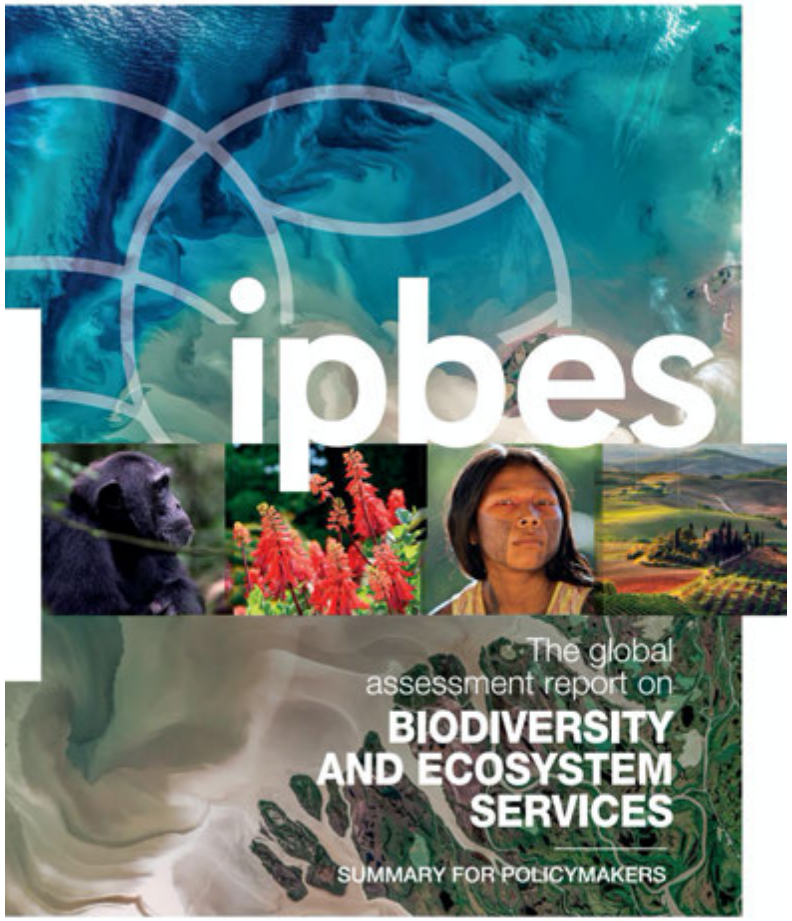
# OUR OCEANS ARE TAKING THE HEAT – BUFFERING >90% OF GLOBAL WARMING



# ERODING BIODIVERSITY– THREAT TO SUSTAINABILITY




ipbes

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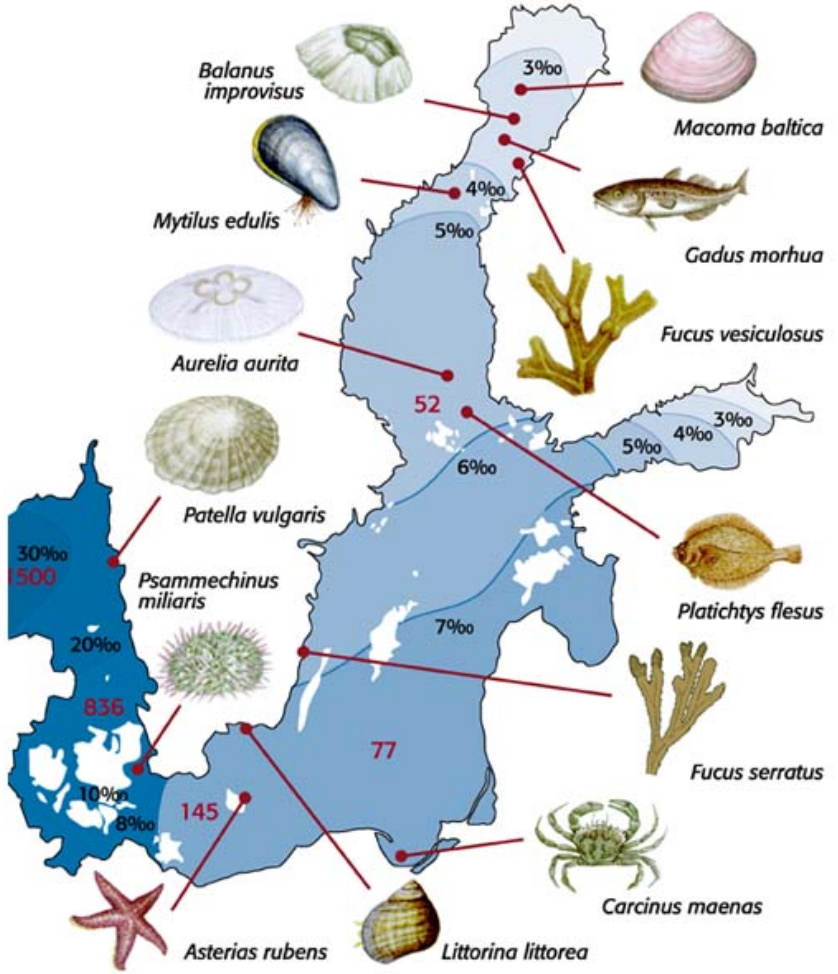
# THE BALTIC – A SENSITIVE COASTAL SEA

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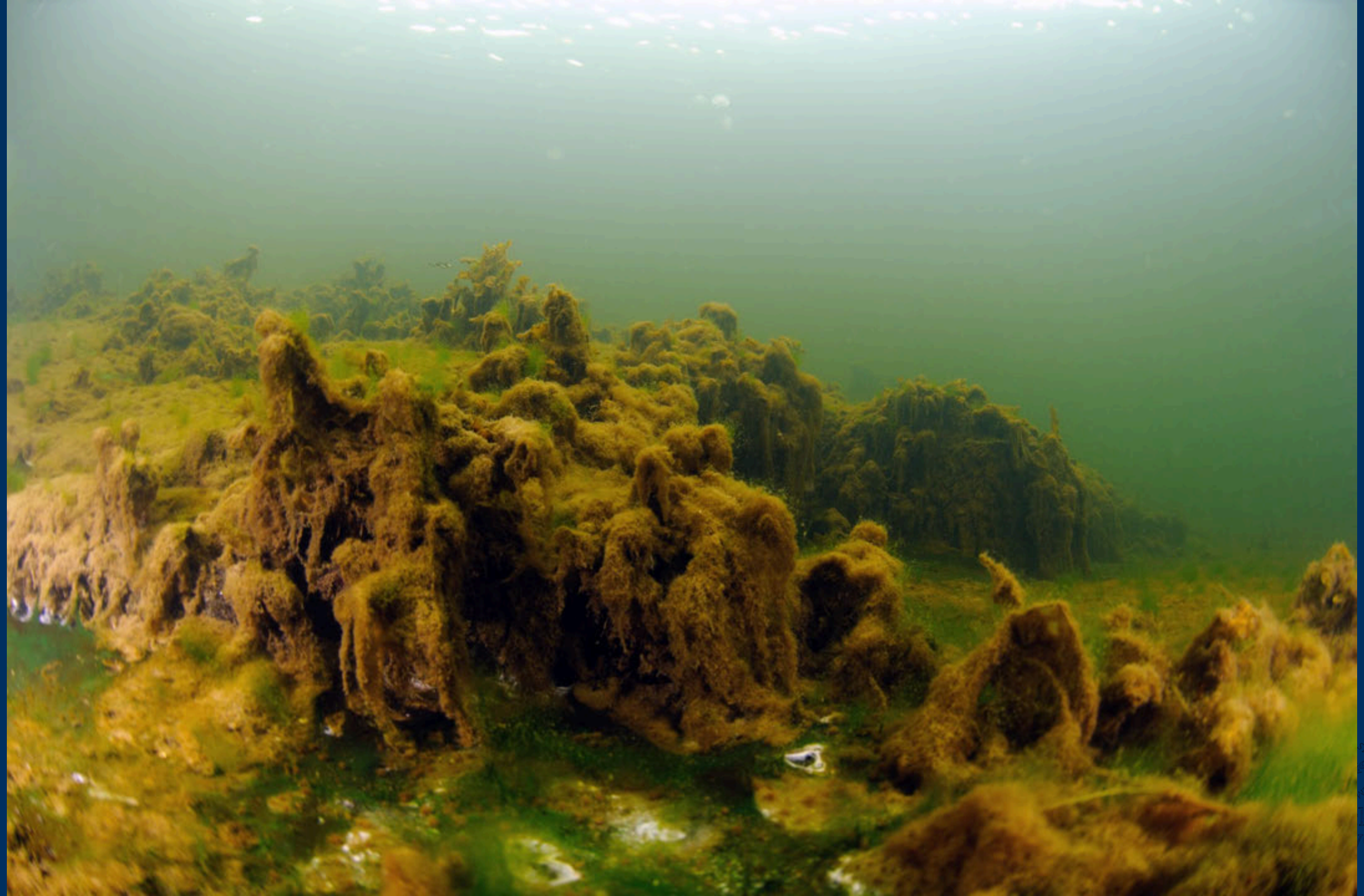
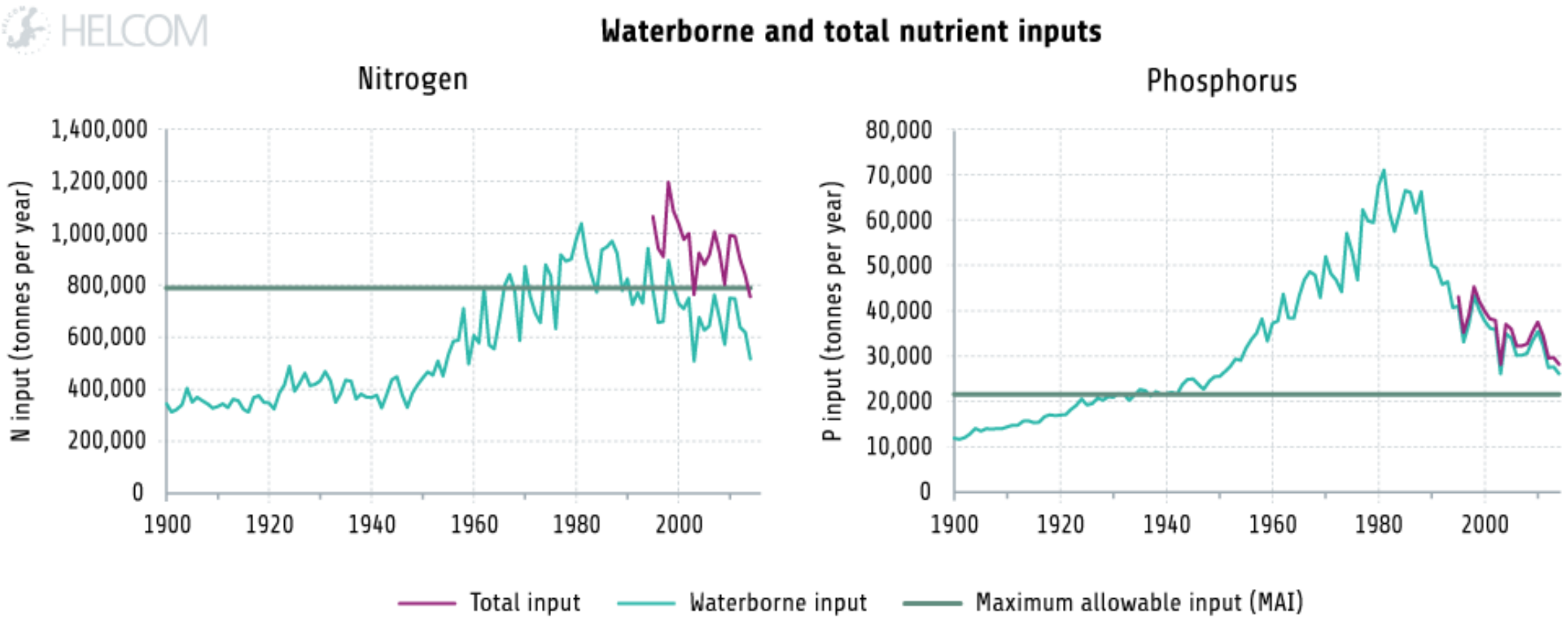
# EUTROPHICATION – THE LARGEST THREAT TO THE MARINE ECOSYSTEM

Photo: Alf Norkko

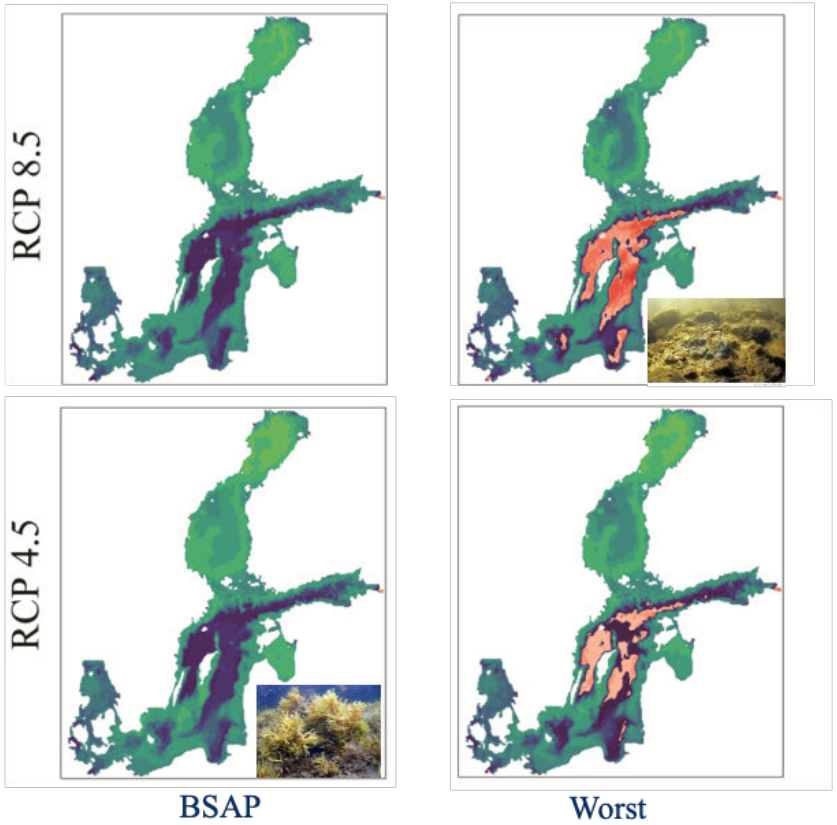


# BALTIC SEA ACTION PLAN- A SUCCESS STORY

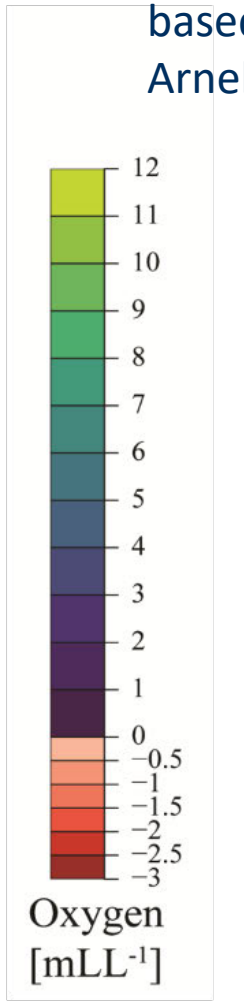


# Measures will improve the Baltic Sea environment - even in a changing climate

Warmer climate




based on Saraiva et al. (2019) and Arneborg (SMHI)




Increased Eutrophication

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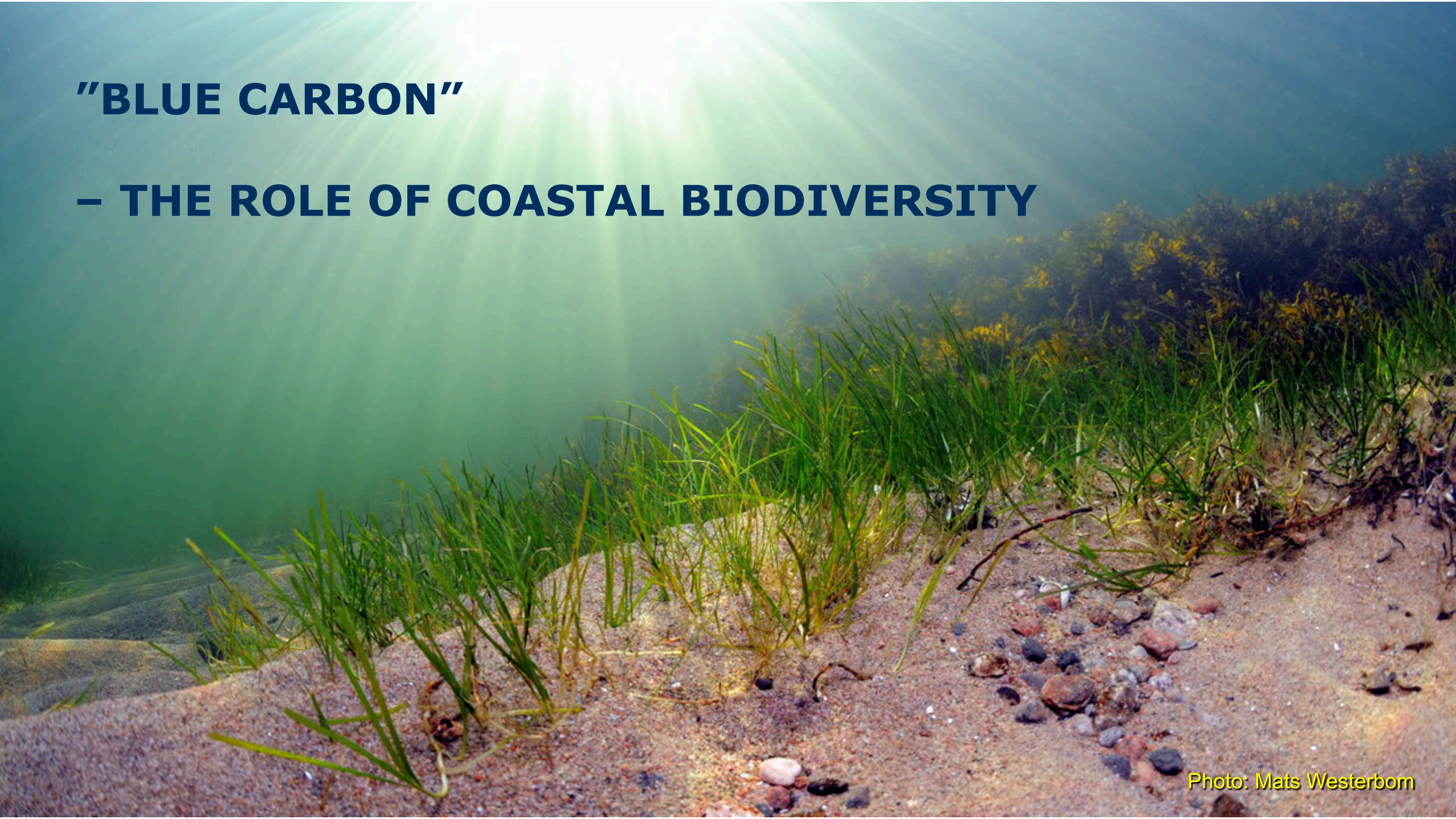
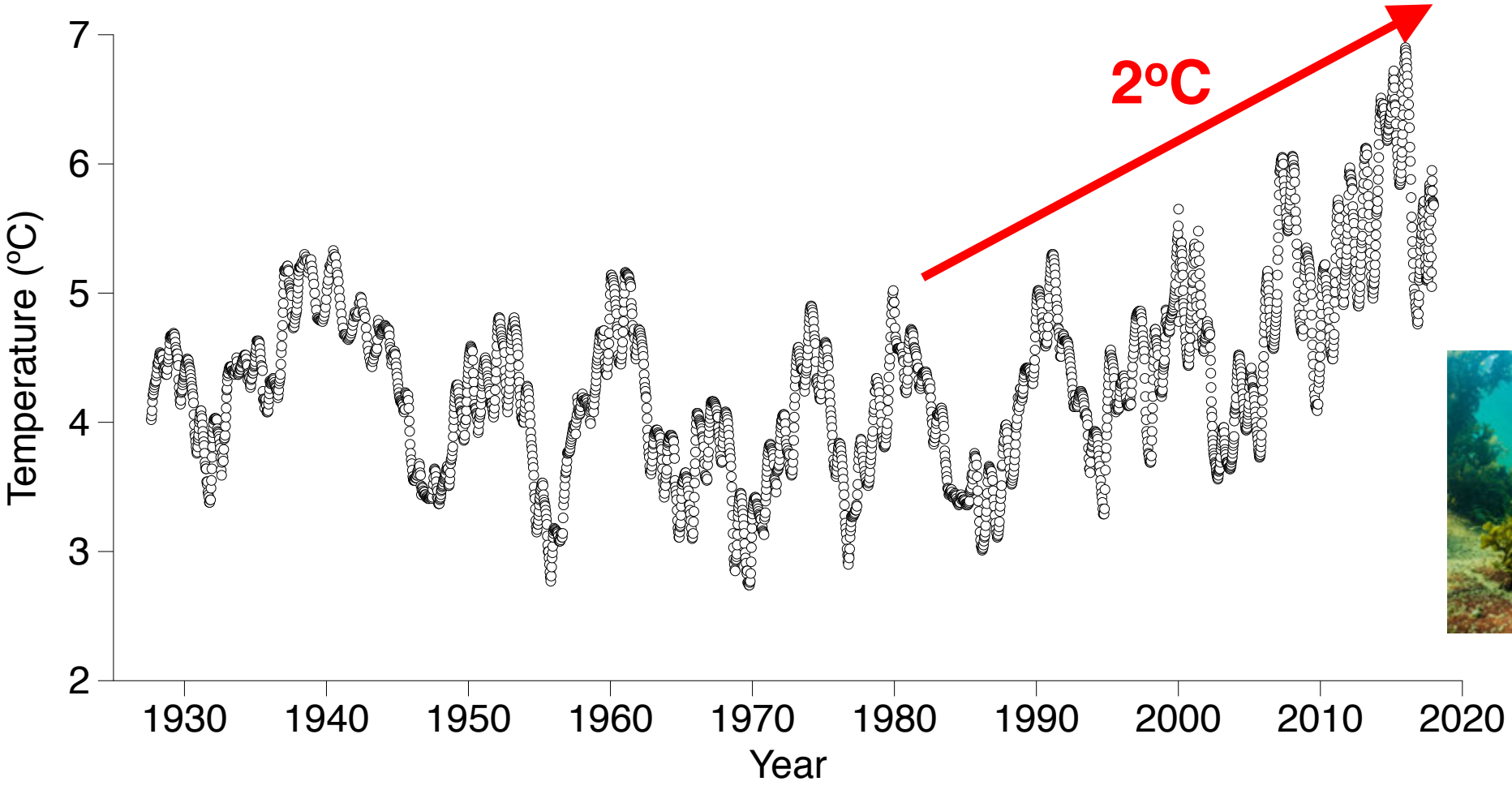
# ”BLUE CARBON”

# – THE ROLE OF COASTAL BIODIVERSITY



# Water temperature at 31 m




Source: Humborg et al. 2019

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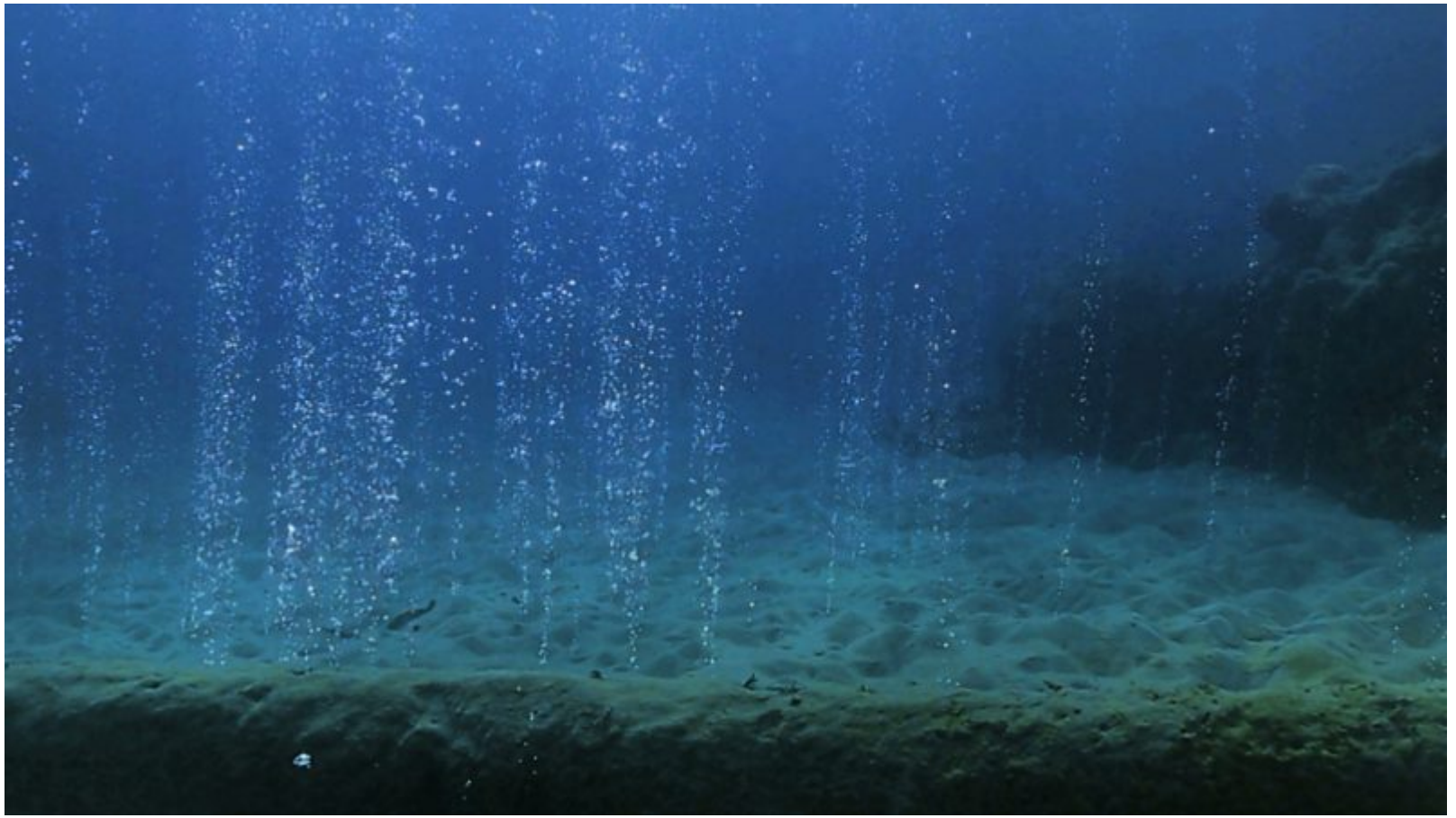
Photo: Mats Westerbom

# Massive methane emissions detected



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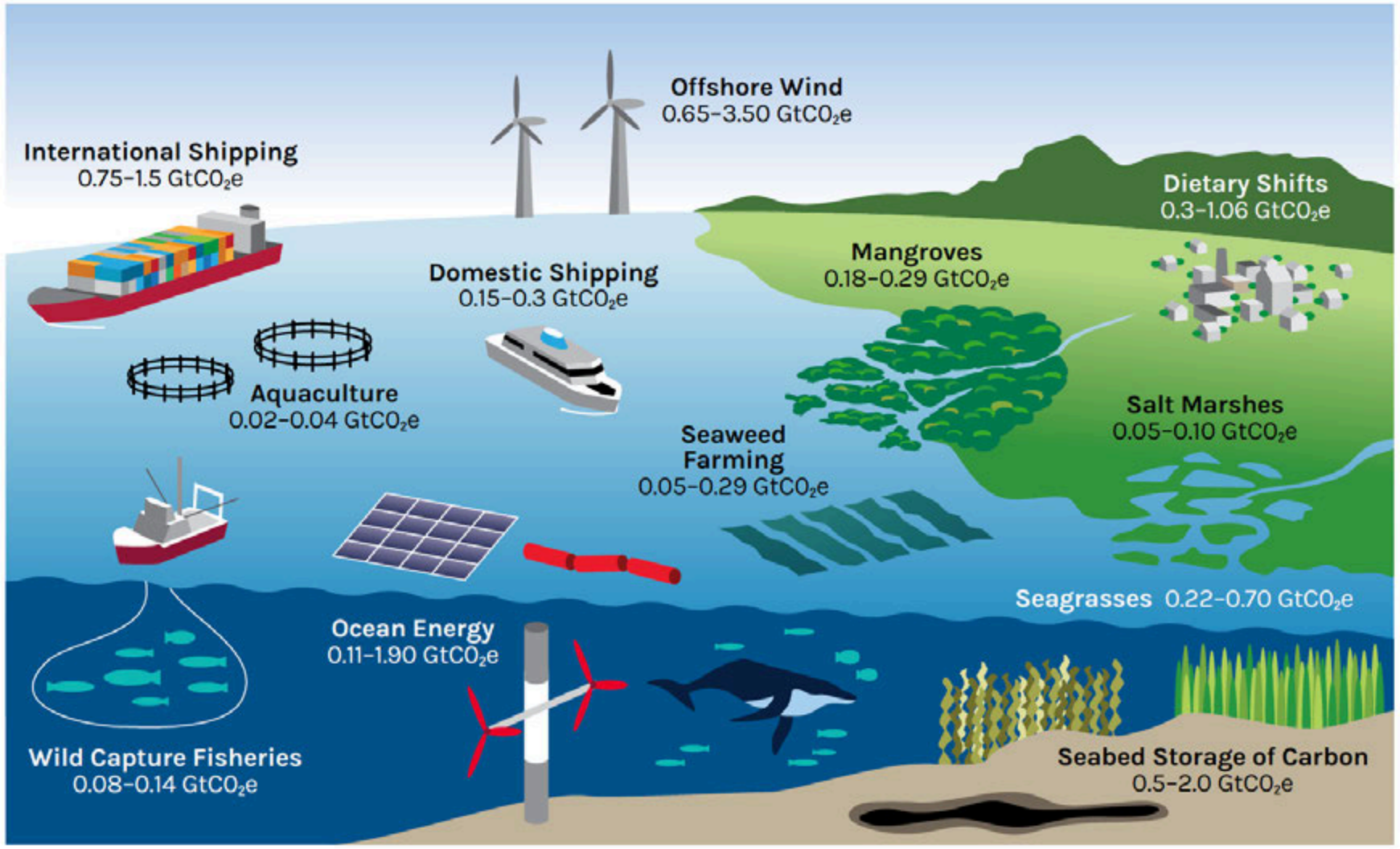
# EUTROPHICATION EXACERBATED BY CLIMATE CHANGE - NEGATIVE EFFECTS ON BIODIVERSITY

- COASTAL AREAS VULNERABLE
- PROTECT BIODIVERSITY FROM MULTIPLE PRESSURES – STRONG ACTION NEEDED (MPA)
- RESTORE CARBON-RICH ECOSYSTEMS TO BUILD RESILIENCE

# Ocean based mitigation options: From victim to solution

**Figure ES-1.** Ocean-based Mitigation Options Explored in This Report and Associated Annual Mitigation Potential in 2050




http://www.oceanpanel.org/climate

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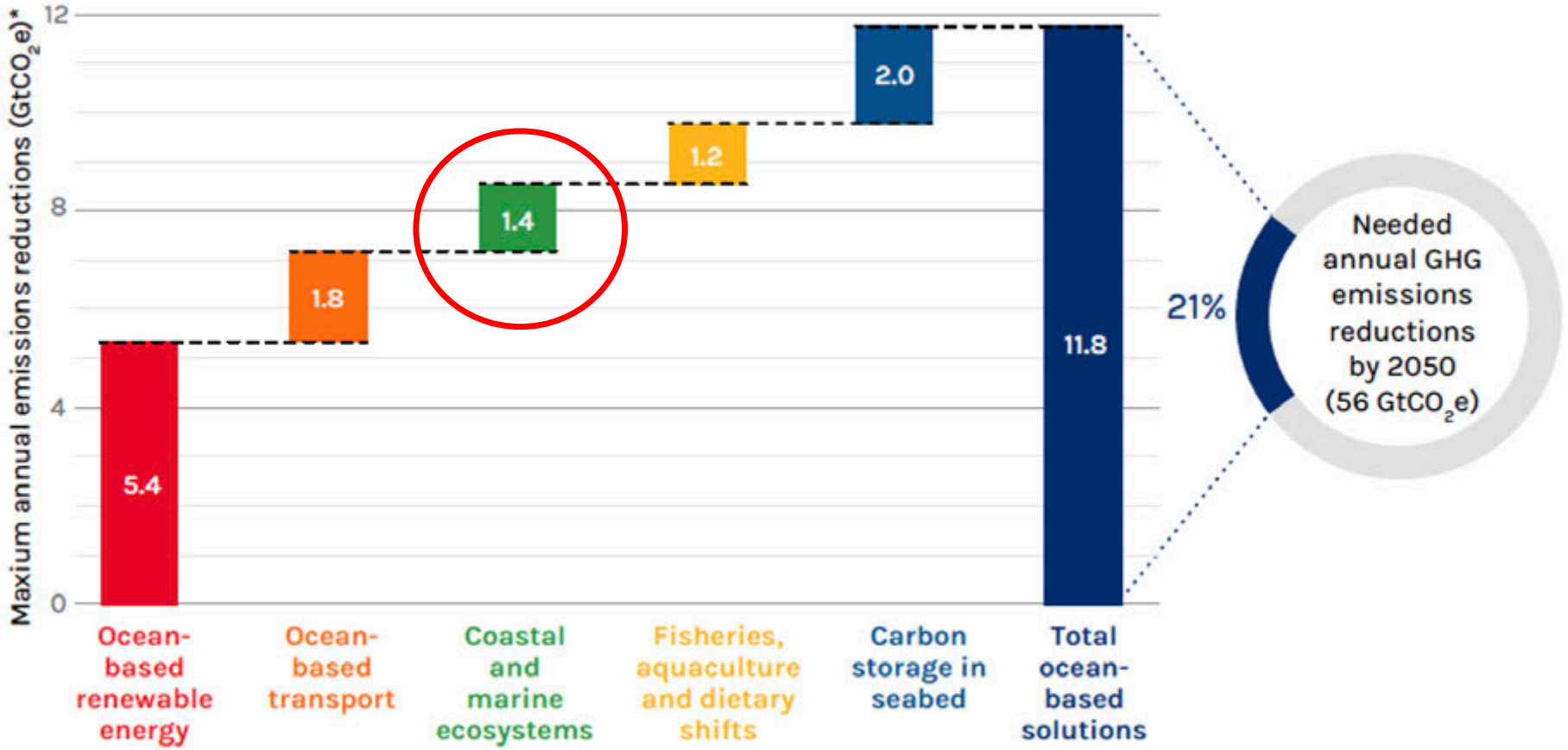
# Ocean based mitigation options: From victim to solution

Figure ES-4. Contribution of Five Ocean-based Climate Action Areas to Mitigating Climate Change in 2050 (Maximum $GtCO_2e$)




*Notes: * To stay under a 1.5°C change relative to pre-industrial levels*

*Source: Authors*

http://www.oceanpanel.org/climate

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# Take home messages

- Following the BSAP will improve the open Baltic Sea environment - even in a changing climate
- A healthy coastal sea with high biodiversity is critical to achieving global targets to limit climate change