

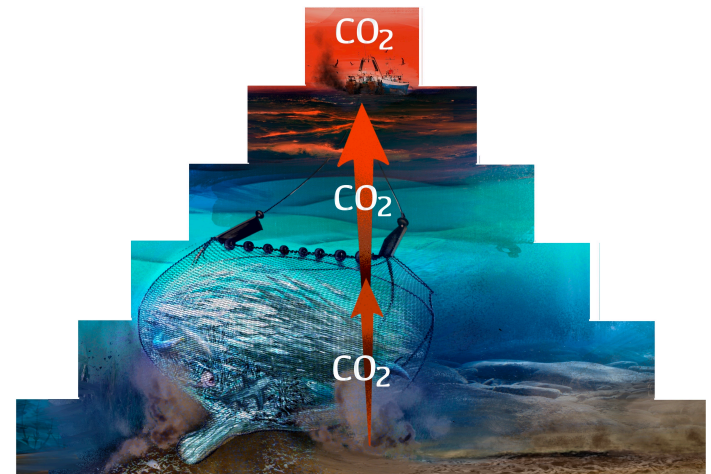
Good Fisheries Management Is Good Carbon Management

North Sea Fisheries & Climate Change Webinar
NSAC 7 December 2022


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Our Fish

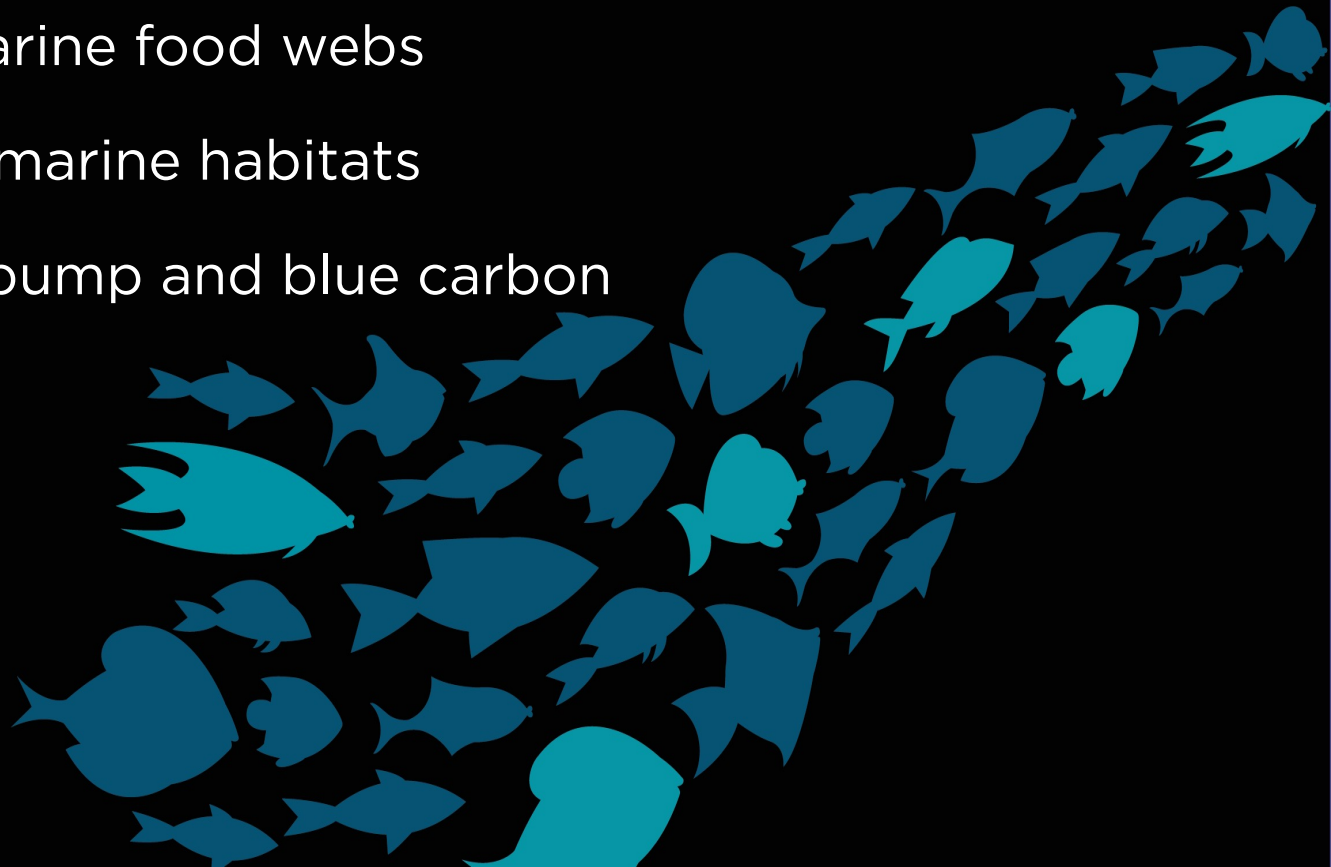


Ocean As Life Giver

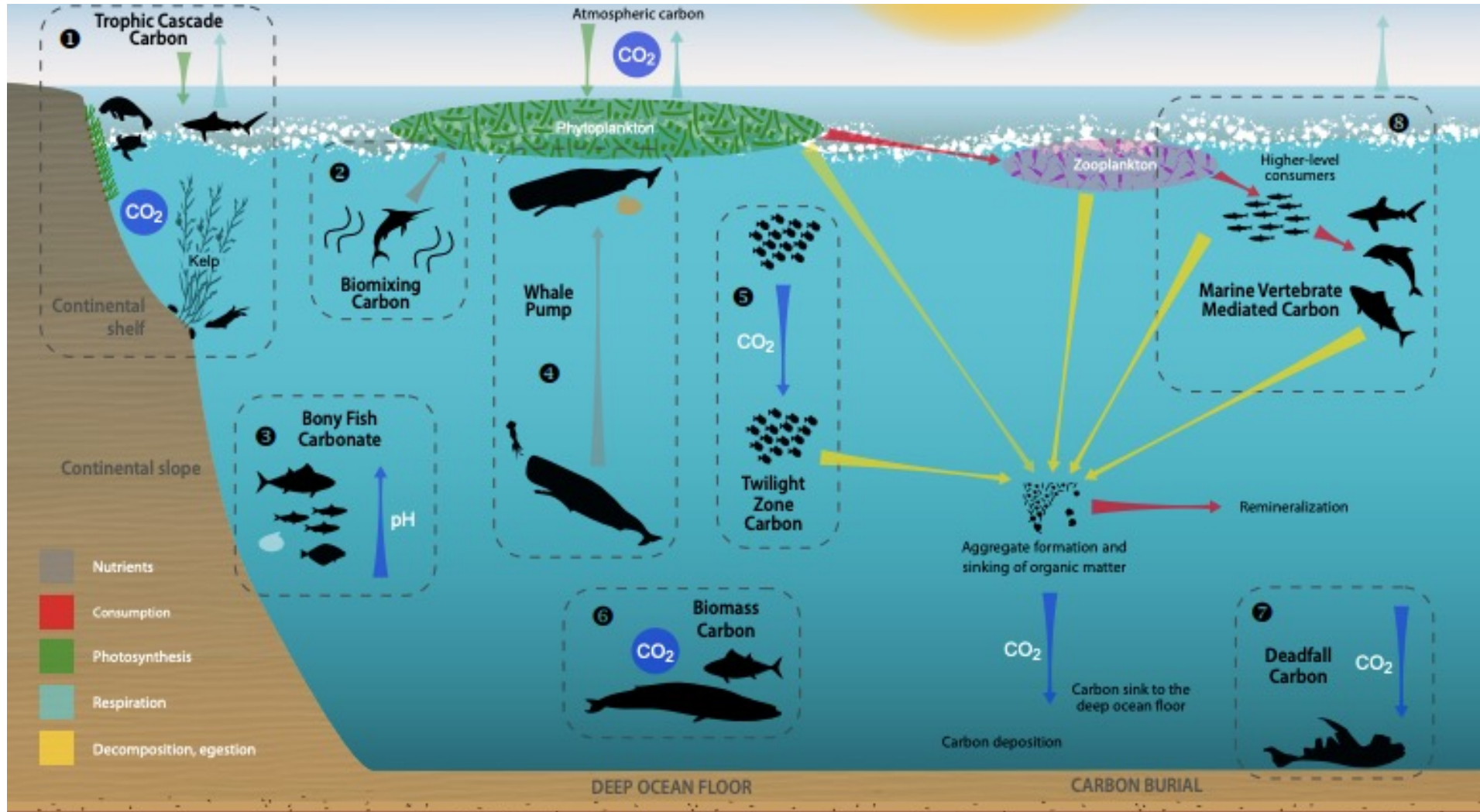
- Source of life on earth
 - Oxygen $\pm 50\%$
 - Water and climate regulation
 - Heat absorption $\pm 93\%$ (36°)
 - Carbon storage $\pm 30\%$
 - Food
 - Medicine
 - Wellbeing ...
- 

Fish As The Lifeblood

- Healthy diverse fish populations
- Functioning marine food webs
- Healthy, intact marine habitats
- The biological pump and blue carbon



Blue Carbon & the Biological Pump



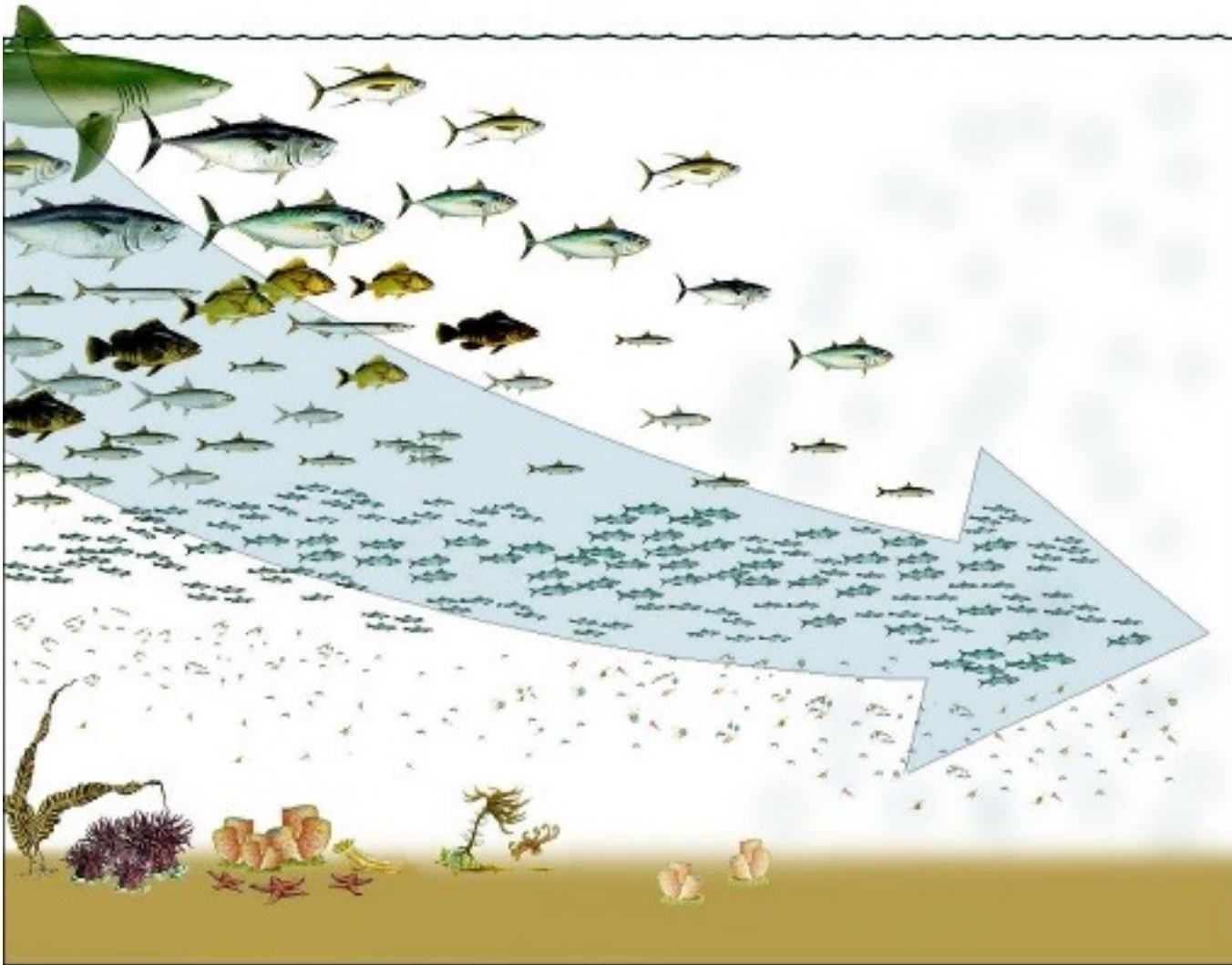
SOURCE: Lutz SJ & Martin AH, 2014, Fish Carbon: Exploring Marine Vertebrate Carbon Services.

Fish are Carbon Engineers

- Previous focus on plankton, but increasing focus on marine vertebrates
- Biomass & deadfall carbon: dead or alive
 - Bony fish carbonate: fish poo is good
 - Twilight zone: mesopelagic mixing
 - \$1 trillion whale pump



Overfishing: Fishing Down Marine Food Web



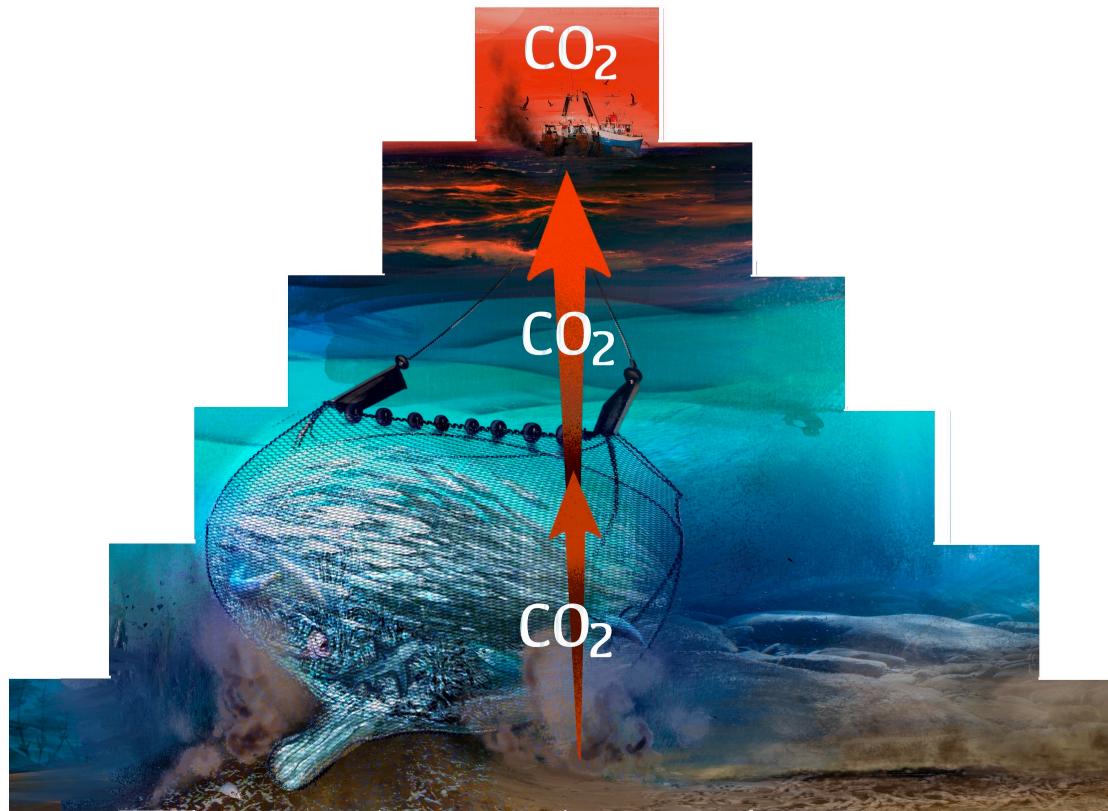
Source: Daniel Pauly, et al. (1998), Fishing Down Marine Food Webs, Science 279, 860 (1998). DOI: 10.1126/science.279.5352.860

Overfishing Is Sapping Our Strength

- The biggest impact on ocean biodiversity
- Declining catches
- Social impacts

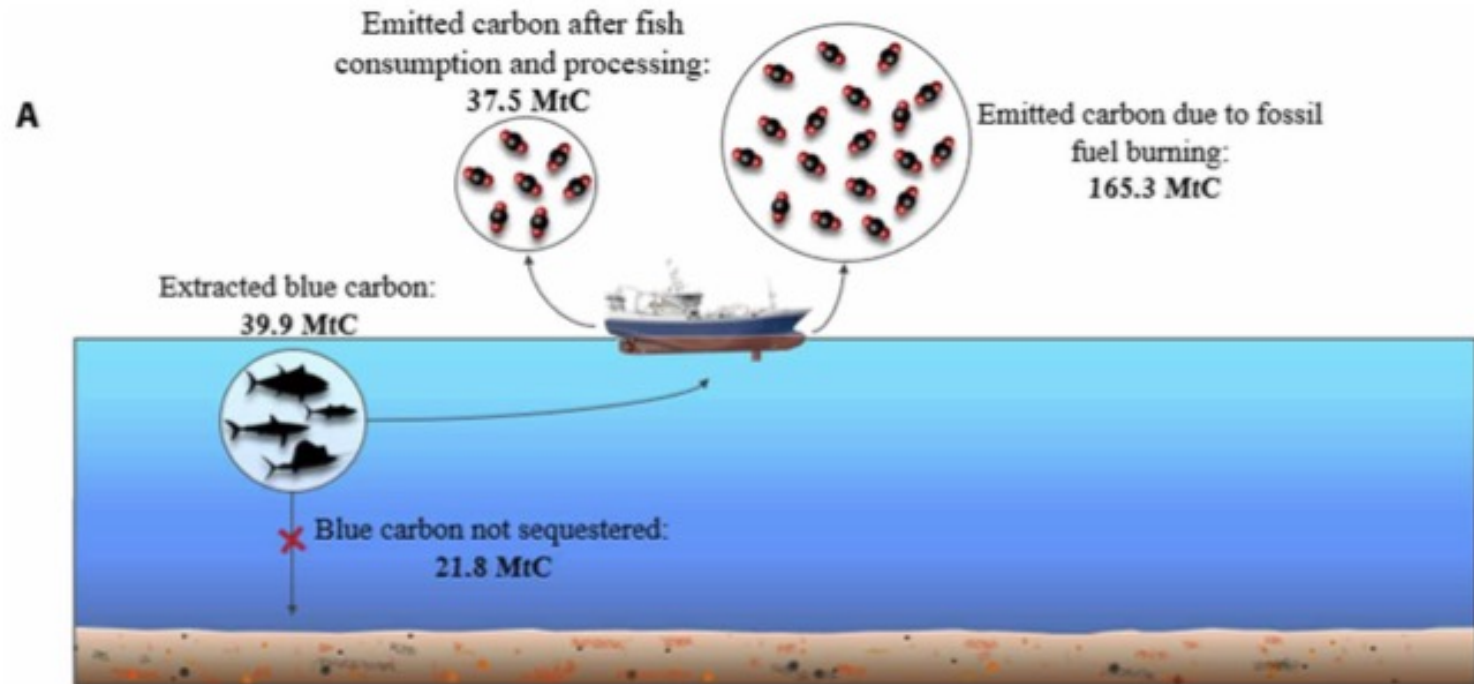


Burning Up & Breaking Down The Biological Pump



Overfishing Impact on Blue Carbon

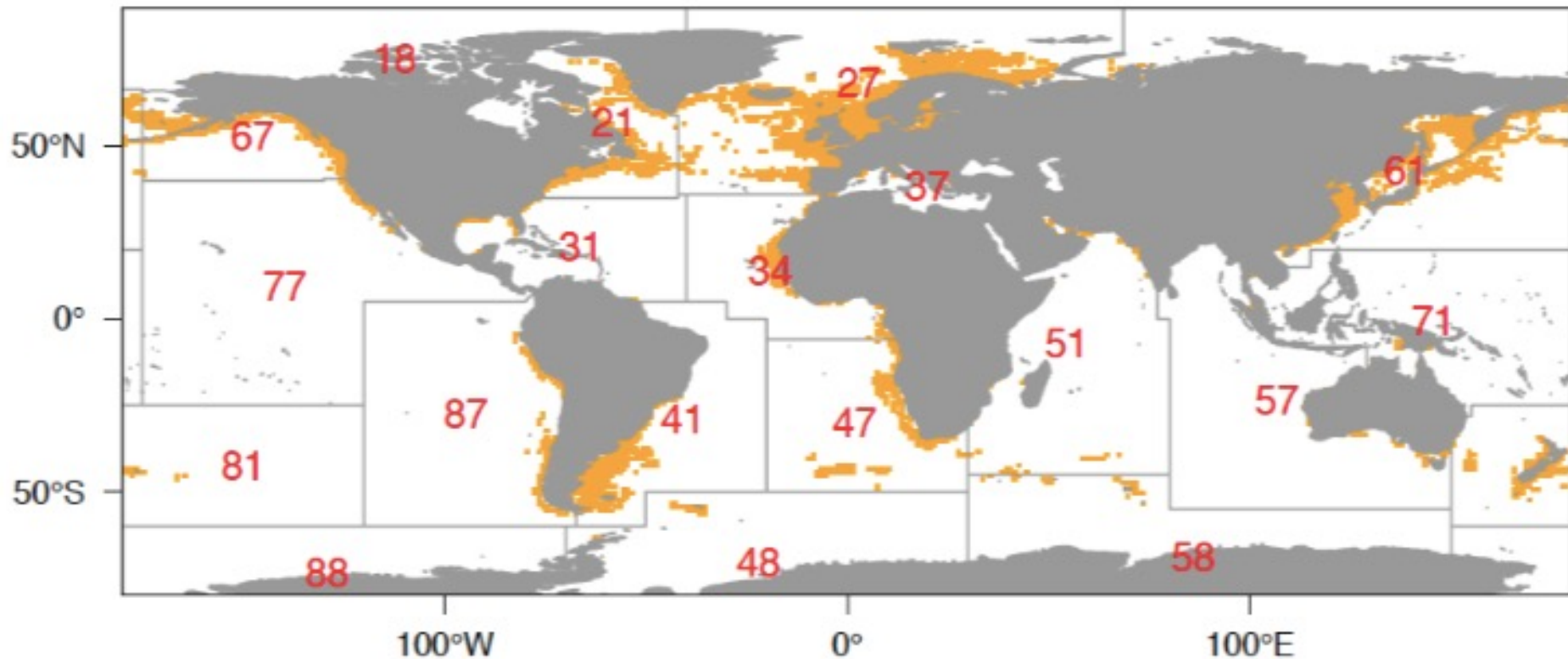
From 1950 - 2014 the world's fishing fleets have extracted 318.4 million metric tons of large fish – this is what it means for carbon sequestration and CO₂ emissions



Source: Mariani et al. 2020, Let more big fish sink: Fisheries prevent blue carbon sequestration—half in unprofitable areas, Science Advances, Sci Adv 6 (44), eabb4848. DOI: 10.1126/sciadv.abb4848

Overfishing Impact on Blue Carbon

Fishing intensity and carbon export are highest near the coastline. A global assessment shows the pinch points are highest in Northeast Atlantic and Northwest Pacific

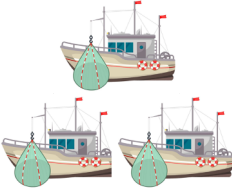
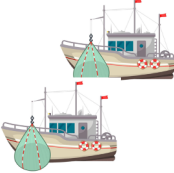



Source: EL Cavan & SL Hill, 2020, BioRxiv, Commercial fishery disturbance of the global open-ocean carbon sink, doi: <https://doi.org/10.1101/2020.09.21.307462>

Double Whammy Of Climate Change

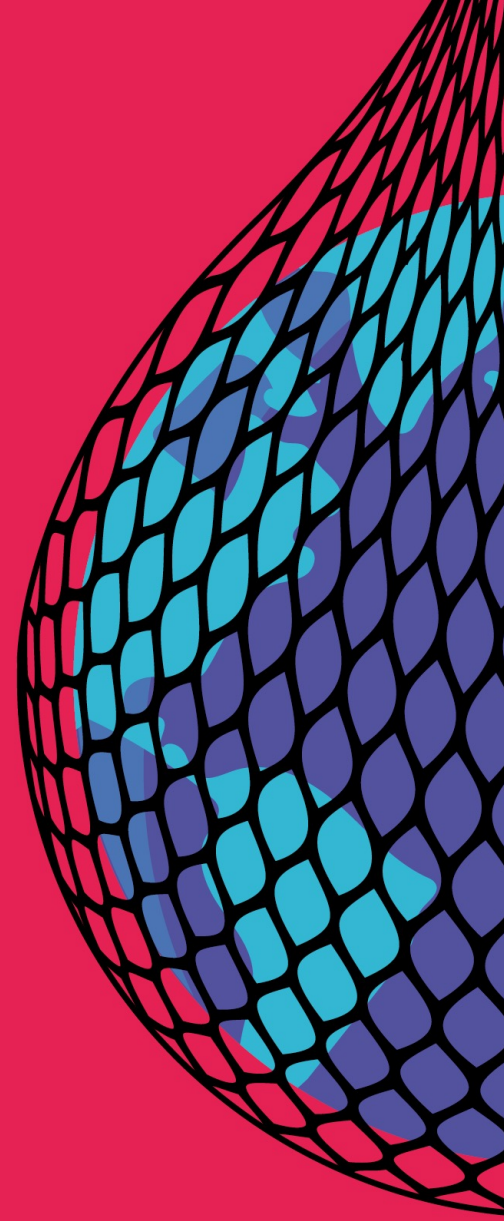
- Increased temperature
- Salinity
- Hypoxia
- Acidification

Stock biomass of 15 Europe's marine regions (relative to pre-industrial unexploited level)

	Weak carbon mitigation (+ 3.5 °C)	Strong carbon mitigation (+1.5 °C)
 Over-exploited	10 – 16%	10 – 20%
 Maximum sustainable yield as target	29 – 42%	39 – 45%
 Conservation- focused target	46 – 67%	63 – 69%

Good Fisheries Management Is Good Carbon Management

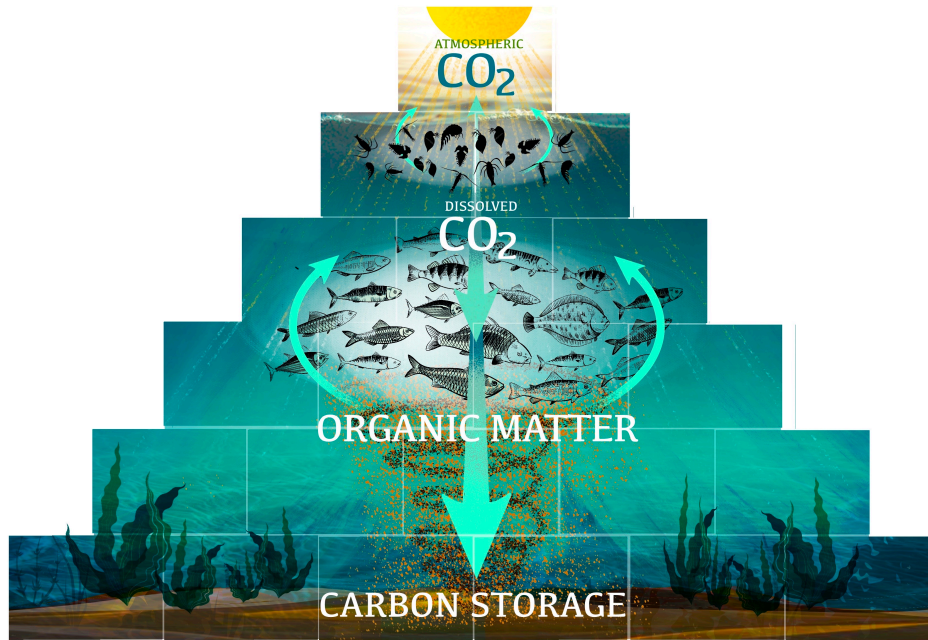
- Increase fish carbon engineers & resilience
- Protect food webs & the biological pump
- Avoid habitat disturbance & destruction
- Decrease CO₂ emissions
- Increase CO₂ sequestration



Redesigning Fisheries Management For Life

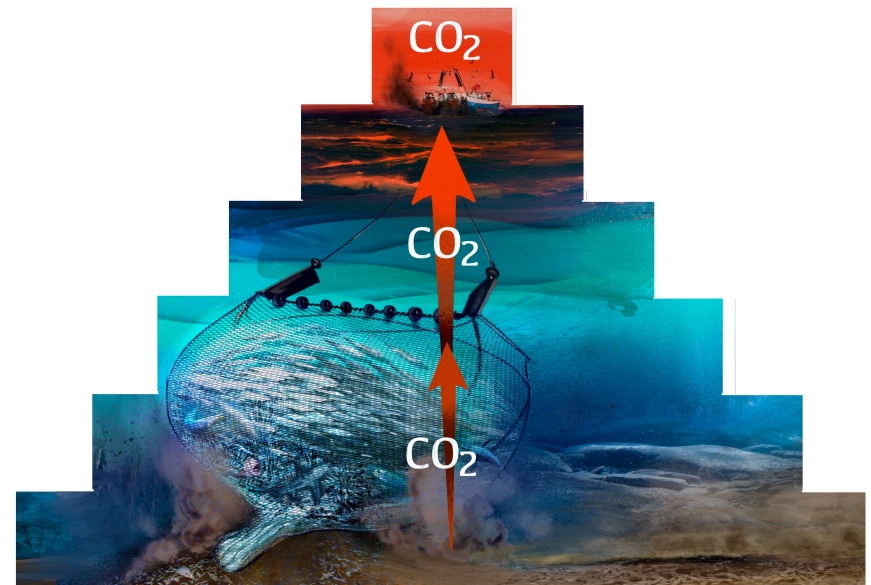
- Set fishing limits below Maximum Sustainable Yield or precautionary advice and rebuild fish populations to B_{MSY}
- Assess & manage the climate and ecosystem impacts of fishing to protect food webs, habitats, carbon stores and ecosystem functioning
- Implement Article 17 to incentivize transition to low impact, low carbon fishing
- Recognise fisheries management as carbon management, including in NDCs
- Stop subsidising fuel tax





THANK YOU

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