Ocean Sequestration SDG214 spring 2025 **THE JOURNEY FROM THE ATMOSPHERE TO THE ABYSS**

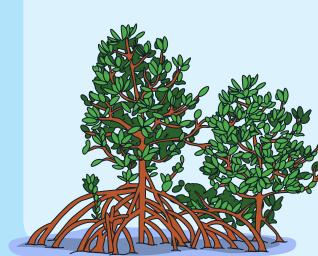
>40 billion tonnes in 2024 total carbon emissions

- Human activities: Burning fossil fuels, deforestation.
- Natural generated carbon: Respiration, decomposion.
- River runoff, surface runoff & volcanic eruption.

30% of the carbon go into the ocean

Carbon dioxide (CO2) Carbonic acid (H2CO3)

The net primary production in coastal ecosystems exceeds around 1 kg C m⁻² yr⁻¹.



The mitigation of climate change via absorption of anthropogenic CO2 is one of the coastal ecosystems' most important properties.



Zone

Bicarbonate (HCO3) Carbonate (CO3-2) CO2 + H2CO3

(Total dissolved inorganic carbon)

DIC



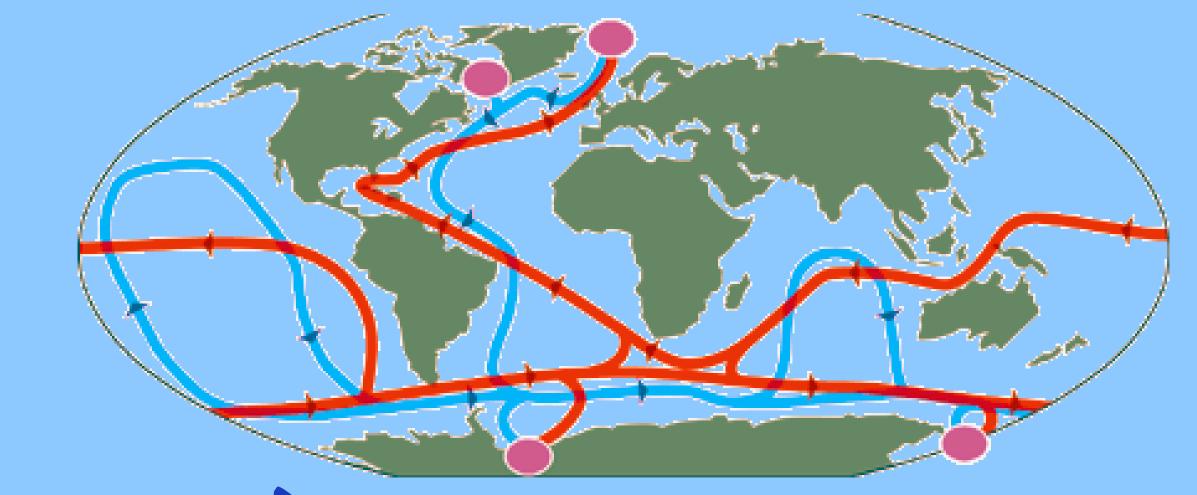
200 m

SEA WATER

CONSEQUENCES

The ocean stores carbon as DIC, the producers use the energy to 'sponsor' each 5th breath and feed higher trophic levels. But excessive storing from excessive production can lead to ocean acidification, resulting in ecosystem changes and food scarcity. It sounds scary, but the lack of storing helps promote global warming, leading to even worse consequences.

Thermohaline transportation



Scan for more information



Abyssal Zone

1000

Cold seawater can dissolve more carbon dioxide.

Cold + salty water = high density \rightarrow the water sinks vertically

Carbon is stored in the deep ocean by **deep-water formation**. When the DIC reaches the deep ocean, it can remain sequestered for centuries to millennia before resurfacing.







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