THE BILLION DOLLAR OCEAN

The ocean is an enormous, natural carbon storage, but using it comes at an unpredictable cost.

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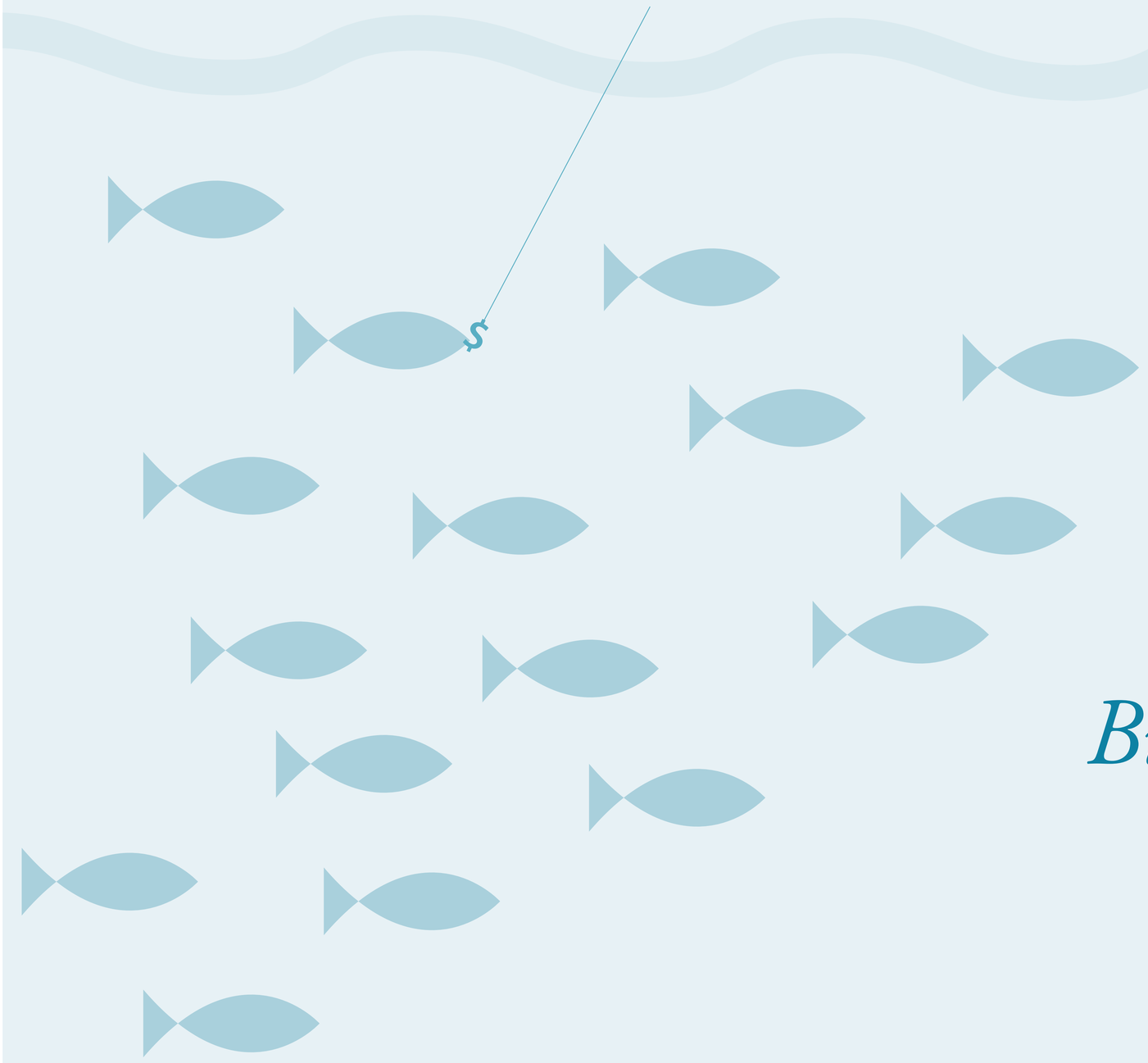
By extracting CO_2 from the air, the ocean saves us billions.

In 2016 the ocean absorbed CO_2 worth €49 billion in EU emission allowances*. The ocean took up 9.6 gigatons carbon dioxide – one quarter of the anthropogenic release – storing it safely for millennia to come.



Ocean acidification is the other side of the CO_2 story. The consequences for fish and other life in the ocean may be large and unforeseen as the oceans get warmer.

Increasing CO_2 in the oceans leads to acidification, dissolving calcium carbonate in shells. This threatens oysters, clams, sea urchins and corals, as well as fish larvae. Together with rising temperatures and deoxygenization, this has a multi-stressor effect on life in the ocean. The world trade in fish and fishery products was US$148 billion in 2014**. About 17 percent of the global intake of animal proteins came from fish.

But what about the fish?

We observe the carbon cycle

The ocean absorbs a quarter of our CO_2 emissions, helping to slow down climate change. The magnitude of this sink needs to be monitored closely. ICOS (Integrated Carbon Observation System) is a pan-European research infrastructure for quantifying and understanding the greenhouse gas balance of Europe and its neighboring regions. The Bjerknes Centre coordinates the ocean component of ICOS-Norway.

We model the global oceans

Earth system models are giant, digital labs – a computer representation of the Earth as we know it, with oceans, atmosphere and land. We have integrated the carbon cycle in the Norwegian Earth System Model (NorESM). This allows us to study how CO_2 is aborbed and released by the sea and on land, and how this influences the acidity of the world's oceans.

We share data

The Bjerknes Centre is heavily involved in the creation of the world's largest data products in the field of chemical oceanography. This work is done under the umbrella of the International Ocean Carbon Coordination Project. Find these and other data sets at www.bcdc.no.

* CO_2 uptake by the ocean per year: 9.6 GT (Global Carbon Budget 2016). Price per ton CO_2 in the EU amission allowances in 2016 (www.quandl.com): €4.37.
** FAO. 2016. The State of World Fisheries and Aquaculture 2016. Contributing to food security and nutrition for all.

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