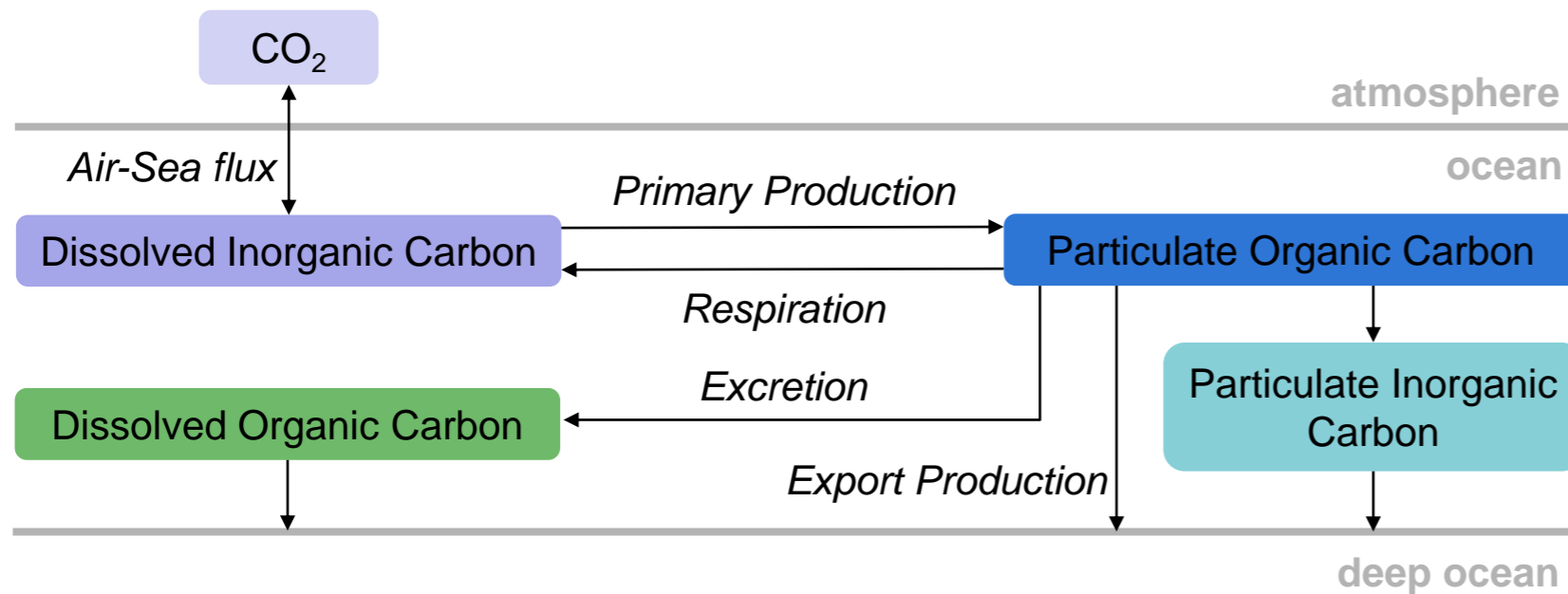


Observing the ocean carbon cycle from space

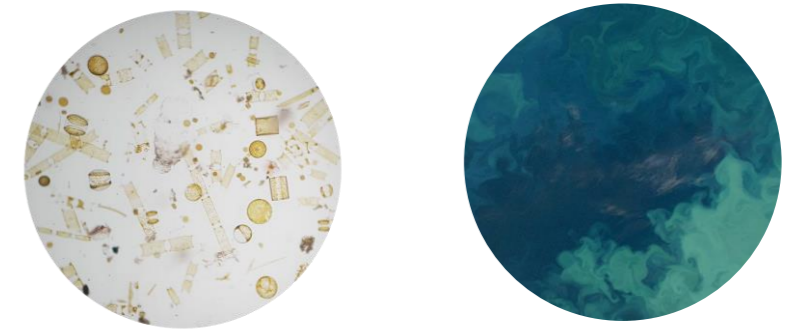
Biological carbon pump

The ocean plays a key role in the Earth's carbon cycle as its biggest carbon store and an important sink of anthropogenic CO₂ emissions thus mitigating climate change. Phytoplankton are responsible for cycling a large amount of carbon through the marine ecosystem via the biological carbon pump.



What are phytoplankton?

Phytoplankton are marine micro-organisms that photosynthesise like plants on land. Collectively they impact the colour of the ocean which can be observed by satellites.

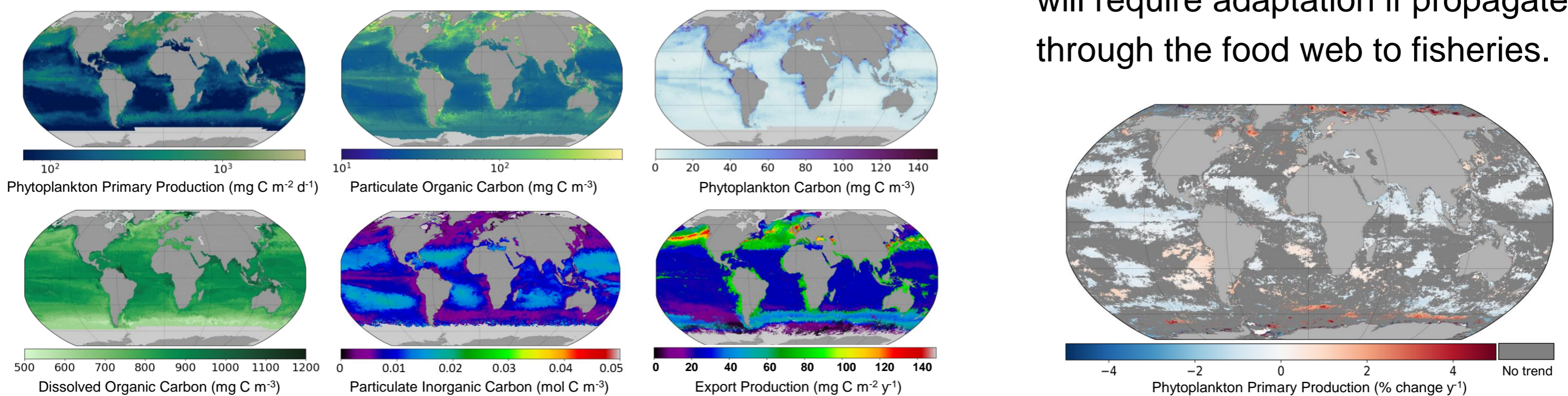


Long-term trends

The ocean carbon products can be used to analyse trends over two decades. Whilst no significant trend is observed globally, primary production is decreasing in the open ocean and increasing in polar waters. These regional shifts in productivity will require adaptation if propagated through the food web to fisheries.

Carbon pools and fluxes from space

Using satellite-based algorithms and models together with machine learning techniques, we use ocean-colour observations to estimate the carbon pools and fluxes in the ocean at the global scale from 1998 to 2022.



Can we determine an ocean carbon budget from satellite observations?

Based on the Ocean-Colour Climate Change Initiative, we produce high-quality and consistent products that provide a satellite-based carbon budget in the surface (mixed) layer of the ocean. Another decade of observations is needed to ascribe trends in the satellite-based carbon budget to climate change.

