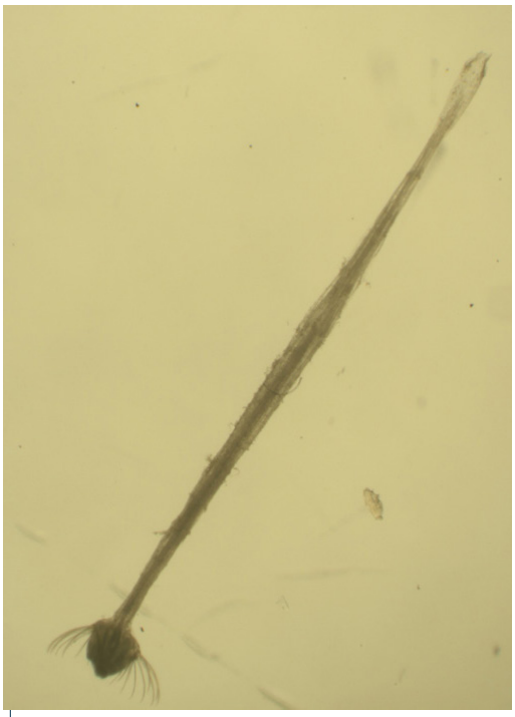
Plankton, Phytoplankton and Zooplankton

Plankton are tiny organisms that live in the oceans where they float with the ocean currents and move with the wind. There are many different types of plankton, which can be divided into two categories: phytoplankton and zooplankton.

Copepod

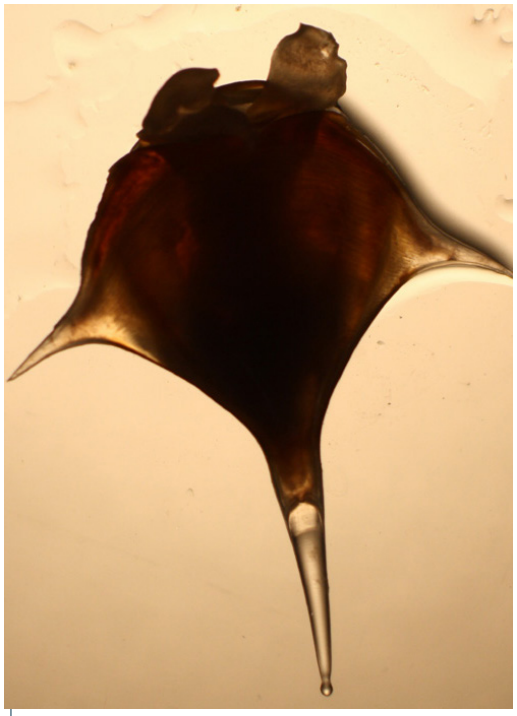
Phytoplankton are microscopic plants which live in the light-rich upper layer of the ocean (the euphotic zone) where abundant supplies of light and nutrients allow them to grow. In the right conditions phytoplankton can make new copies of themselves in a day. Sometimes this rapid growth rate can cause huge blooms that colour the ocean green and can even be seen from space.

Although they are smaller than the width of a human hair, phytoplankton play a very important role in how the ocean and climate function. Phytoplankton obtain nutrition by photosynthesising; they convert sunlight energy into chemical energy and they also take up dissolved elements from seawater, including carbon dioxide, to make new cells. Phytoplankton form the base of the marine food chain, feeding everything else that lives in the ocean, and have existed, in various shapes and sizes, in our oceans for millions of years.

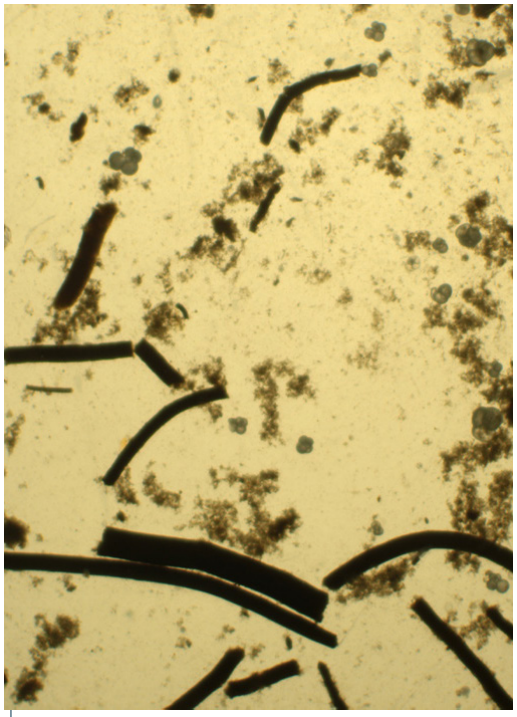


Chaetognath

The White Cliffs of Dover are made up of a phytoplankton called coccolithophore, which surrounds itself with tiny plates made of calcium carbonate (chalk). As the coccolithophores died they sank to the seabed and formed layer upon layer of chalk. Over time these layers got squeezed into rock.



Pteropod



Plankton poo

Zooplankton cannot photosynthesise and must get their nutrition by feeding. Zooplankton include the larval forms of other animals such as muscles, fish and clams that feed on phytoplankton and are, in turn, eaten by organisms such as fish, whales and sharks.

Zooplankton are a major part of the Biological Carbon Pump which transfers carbon from zooplankton excrement, skin and dead zooplankton to the deep sea and the sea bed where it is locked away. Dead zooplankton sink to the depths of the ocean in a 'marine snow' and this transfer of carbon to the deep sea helps maintain the balance of carbon dioxide in the atmosphere and regulates our climate.

What we do at the National Oceanography Centre

Phytoplankton are vulnerable to changes in the ocean climate. The oceans absorb about 30% of current human carbon emissions, which has made the pH of the oceans more acid. This acidification, along with global warming and changes to the light environment, affects phytoplankton and scientists are looking at how a further increase of acidification will affect phytoplankton and subsequently, the ocean marine food chain. The National Oceanography Centre has also been catching and analysing the excrement, skin and dead plankton at different depths in the deep ocean for thirty years, measuring how much carbon sinks each month of the year.