Plankton seasonal cycles in the Norwegian and North Seas
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Plankton are the base of the ocean food web and fundamental for the marine environment. The phyto and zooplankton cycles in the Norwegian and North Sea support many fish populations (including commercial stock) and are key for ocean nutrient cycles and primary production.

**CASE STUDY: RV Dana Cruise, Norwegian and North Seas, May 24th - 28th**

With the end of the spring bloom, dinoflagellates (Fig. 2A) were the most abundant group of phytoplankton observed (Ceratium sp., Protoperidinium sp.). These are some of the largest phytoplankton in the oceans, and therefore could be observed even in a stereo microscope.

*Calanus* nmarchicus (Fig. 2B, 2C), the main contributor to the zooplankton biomass in the North Atlantic, was the dominant secondary producer. However it was more abundant in the northern stations, possibly due to the end of the spring bloom in the region.

Crustaceans were the most abundant group of zooplankton observed. The most important representatives were copepods (Fig. 2B), amphipods, calanoids, cladocerans (*Daphnia* sp.) (Fig. 2D) and euphausids. Chaetognaths (Fig. 2E) were common in all stations. Ctenophores (Fig. 2F), tunicates and polychaetes also occurred occasionally. The most common meroplankton were echinoderms and crustacean larvae.

**DISCUSSION**

The chlorophyll peak detected by the CTD fluorescence measurements (Fig. 3) was higher in the first stations, which evidences the lag in timing of the spring bloom from the northern Arctic waters in comparison to southern coastal waters. The high chlorophyll levels observed on deeper waters (~70m) in the north could be related to a dinoflagellate (or even a phaeocystis) bloom. These facts together reinforce the transition period between the Spring and Summer seasons in the plankton cycle. The new generation of *Calanus* sp. is still maturing at this time of the year, and adults could have already laid eggs during the peak bloom.

The spring bloom is essential for the maintenance of the North Atlantic ecosystem. Diatoms are the favoured food source for copepods, which in turn are the main food source for many fisheries and sea mammals. The impact of climate change and warming temperatures in the phenology of plankton are not yet known, and a mismatch between the diatom and copepod cycles could have potentially dire consequences for the whole marine environment.

**REFERENCES:**