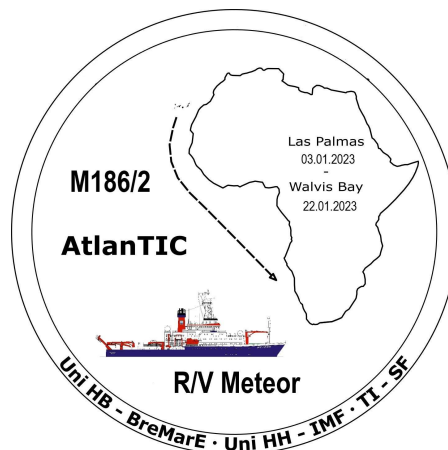


## First Weekly Report of the Research Cruise M186/2 with R/V METEOR for the period of 3rd to 8th January 2023



On Tuesday, 3rd of January 2023, our voyage started at 09:00 a.m., when we left Las Palmas on Gran Canaria in southerly direction. With mainly sunny weather and blue skies, light north-easterly trade winds pushed us forward.

The research cruise M186/2 is focused around the AtlanTIC project, which studies the productivity, trophic interactions, and functional biodiversity of pelagic communities in different regions of the Atlantic Ocean and their impact on the carbon cycle.

Marine ecosystems are strongly affected by climate change. In turn, biological processes in the water column have effects on the carbon cycle and, thus, cause a feedback mechanism to the global climate system. Zooplankton organisms play a key role in the biological carbon pump in the ocean. They are the primary link from unicellular algae providing primary production to higher trophic levels, including fish and top predators. Via ingestion, fecal pellet production, respiration and vertical migrations, zooplankton and micronekton contribute to the active carbon transport from the sea-surface layer into the deep sea.

The objective of our research cruise is to quantify and better understand regional differences in productivity, community structure of phyto- and zooplankton as well as in predator-prey interactions. Moreover, AtlanTIC is a joint education and capacity building initiative of the marine sciences sectors at the Universities of Bremen and Hamburg, in particular for the study programmes Marine Biology / International Studies in Aquatic Tropical Ecology (ISATEC, Uni Bremen) and Marine Ecosystem and Fisheries Sciences (Uni Hamburg).

For that purpose, AtlanTIC uses the transit of the research vessel METEOR from Las Palmas (Gran Canaria, Spain) to Walvis Bay (Namibia) for station work and sampling along the cruise track. The expedition passes through different geographic and climatic regions from the oligotrophic, subtropical North Atlantic in winter via the tropics and the subtropical South Atlantic in summer to the highly productive coastal upwelling system of the Benguela Current off Namibia. Eight scientists, one Ph.D. candidate and 14 students from the Universities of Bremen and Hamburg as well as from the Thünen-Institute for Sea Fisheries and from the Federal German Maritime and Hydrographic Agency (BSH) participate in the cruise.

We used the first two days at sea to set up the laboratories and to prepare the plankton nets and sampling equipment. In addition, we received a safety at sea introduction and a security drill. On Thursday, 5th of January, we sampled the first two stations in the region between the Canary Islands and the Cape Verde Islands.

At each station, we deploy a CTD sensor connected to a rosette water sampler in order to measure depth profiles of temperature, salinity, dissolved oxygen concentration, light, and chlorophyll fluorescence. On the way back to the surface, we collect water samples from discrete depth layers. Afterwards, we deploy several plankton nets with different mouth openings and mesh sizes in order to sample different plankton size classes from unicellular phytoplankton algae to small zooplankton animals in the millimetre- to centimetre-scale. Our largest net, the Isaacs-Kidd-Midwater-Trawl (IKMT) with a mouth opening of seven square metres and 4.5 mm mesh size is towed behind the vessel and catches larger crustaceans and small fishes.

To train the students in state-of-the-art methods in marine research, they are fully integrated in the AtlanTIC project work on board. They learn how samples and data are collected at sea and how results are analysed and interpreted. For that, students work in small teams on topics such as physical oceanography, phytoplankton production and biodiversity, micro- and mesozooplankton biodiversity, macrozooplankton and mesopelagic fish as well as seabird and marine mammal surveys.

On the 6th and 7th of January, we passed the waters near Cabo Verde, where we saw the first groups of flying fish. They jump out of the water and glide with their fins for up to 100 metres over the water to avoid the bow wave of the vessel. Regularly, we also found large amounts of *Sargassum* drifting seaweed at the ocean surface. These macroalgae usually occur in the western North Atlantic and share their name with the Sargasso Sea south of Bermuda. However, in recent years, their distribution and abundance have changed so that drifting algal mats occur now more often in the eastern Atlantic.



*Fig.: R/V METEOR on southward course (Foto: Jan Zimmermann), Multinet deployment (Foto: Sabine Eberle), pteropods (Foto: Jan Zimmermann), teaching methods of plankton research on Saturday afternoon in the conference room (Foto: Sabine Eberle). Fotos from top left clockwise.*

Today on Sunday, we started the station work at our third station at 06:00 a.m. in order to deploy the IKMT net still at darkness, when many marine creatures are in the upper layers of the water column. At sunrise, they retreat to greater depths to avoid predators. Station work is continuing, while I am writing this report.

On behalf of all scientists and students on board, I would like to thank Captain Korte and the entire crew for the friendly welcome on board and wish us all a successful and interesting research cruise.

Everybody at home, we still wish – albeit slightly delayed – a Happy and Healthy New Year and we send best regards from R/V METEOR.

On behalf of all cruise participants,  
Holger Auel  
(MARUM – Center for Marine Environmental Science, University of Bremen)