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Press release

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Research projects
Environment / ecology, Oceanology / climate
transregional, national

Long-term measurements for climate research

07.01.2025, Kiel/Belém. Last weekend, the first GEOMAR expedition of the year set sail: on board the research vessel METEOR, an international team of scientists set off from Belém, Brazil, to Mindelo, Cabo Verde. The aim of the mission is to study oceanographic and meteorological processes in the tropical Atlantic, focusing on the western boundary circulation and long-term measurements of the Atlantic Meridional Overturning Circulation (AMOC).

Led by Dr Rebecca Hummels, physical oceanographer at the GEOMAR Helmholtz Centre for Ocean Research Kiel, the METEOR expedition M207 "WARD Tropics" started this weekend. The five-and-a-half-week research cruise spans the tropical Atlantic, investigating oceanic and atmospheric processes.

The title of the expedition, WARD, summarises its three main research topics: the Western Boundary Circulation, the Atlantic Meridional Overturning Circulation (AMOC), and Rain and Dust in the Tropical Atlantic.

Focus on ocean currents

A key focus of the expedition will be the western boundary circulation off South America, in particular the North Brazil Undercurrent (NBUC), which plays a key role in the Atlantic Meridional Overturning Circulation. The team will maintain and deploy deep-sea moorings along the Brazilian coast and at the equator, continuing a decade-long data series.

"These long-term data are extremely valuable," says Rebecca Hummels. "The AMOC is a critical factor in global climate regulation. It transports significant amounts of heat and nutrients within the ocean. Any changes in this circulation could have a profound impact on weather patterns, sea levels, and global carbon uptake".

Measurements in water and air

To conduct their research, the scientists will use a variety of advanced instruments, including:

- CTD probes to measure salinity, temperature, and depth (pressure), complemented by sensors for oxygen, nutrients, and particle distribution.
- ADCPs (Acoustic Doppler Current Profilers) to measure the speed of ocean currents at different depths.
- Mooring-based instruments, similar to CTD and ADCP systems, with additional sediment traps at the Cabo Verde mooring site to analyse nutrient fluxes in the ocean.
- Radiosondes, launched with balloons to measure temperature, humidity, pressure, and wind at different altitudes.

Contributing to international climate research

The comprehensive measurements will improve understanding of ocean-atmosphere interactions and provide insights into changes within the climate system. Rebecca Hummels emphasises: “The data collected will contribute to a better understanding of oceanic processes and improve long-term predictions of the impacts of climate change on the ocean and atmosphere.”

Expedition at a Glance:

Name: METEOR Expedition M207 WARD Tropics

Chief Scientist: Dr Rebecca Hummels

Dates: 4 January - 12 February 2025

Start: Belém, Brazil

End: Mindelo, Cabo Verde

Region: Tropical Atlantic

URL for press release: http://www.geomar.de/n9709 Images available for download

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METEOR M207