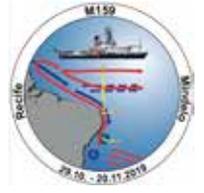




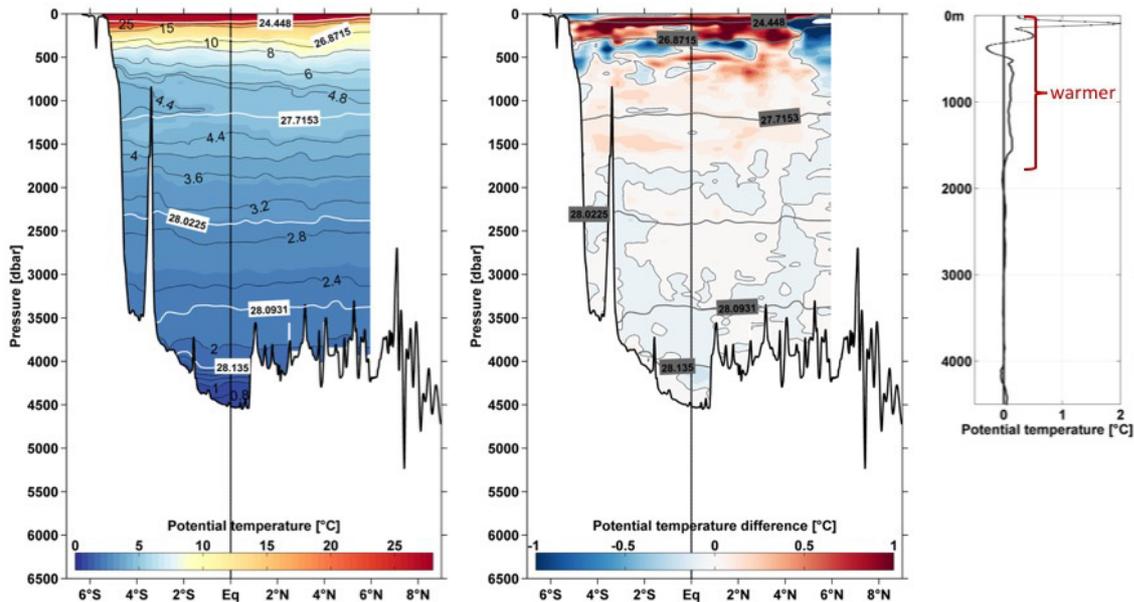
# M 159

(29.10. -20.11.2019)



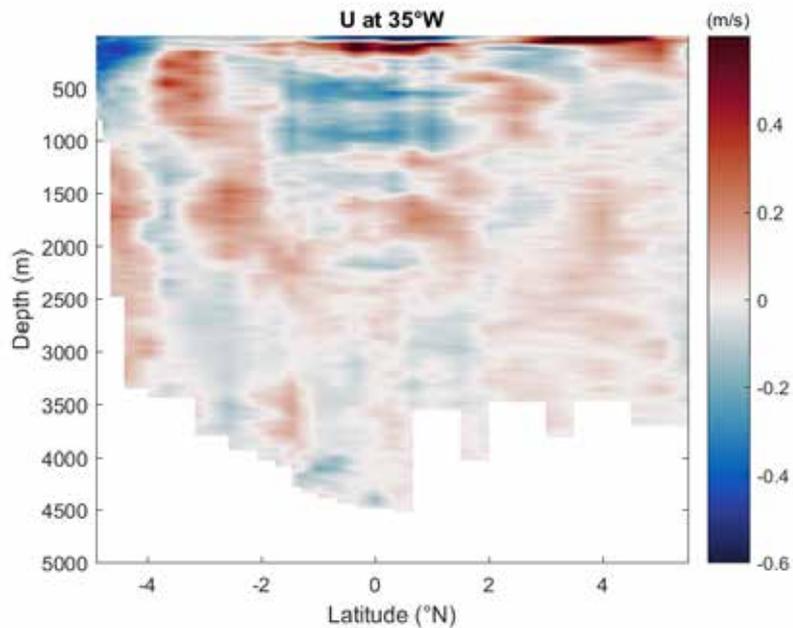
## 3. weekly report from 17.November 2019

This week we completed the 35°W hydrographic section that we started last week by taking 12 additional CTD stations to the bottom. We were able to determine prevailing water masses and currents starting from the coast of Brazil passing by the equator to 6°N. This section was last occupied in 2003. The temperature measurements clearly show a warming over the past 16 years in the surface layers, but also reaching to depths larger than 100m.



*Temperature sections along 35°W and their changes over the last 16 years. Left: temperatures from this cruise, middle: difference to 2003, right section average warming as a function of depths. One can clearly see the warming over the upper 1600m water depths. (Graphic from J. Herrford)*

The velocity profiles, collected with the CTD mounted lowered ADCP document the fast northwestward North Brazil current just off the coast of Brazil. Crossing the equator, the complex structure of the zonal current bands is prominent. The Equatorial Under Current (EUC) flowing along the equator was relatively broad with velocities over 0.5 m/s. At the surface and below the EUC the currents were oriented westward.



*Zonal velocities at the 35°W section from IADCP measurements. The currents of the northwestward North Brazil Current, the South and North Equatorial Under Currents (4°S / 4°N – SEUC, NEUC) as well as the Equatorial Under Current at 0°N are featured. (plot. M. Hundsdörfer)*

R/V METEOR is transiting since Thursday to our last region of interest for this cruise, the Cape Verde Islands. Just north of the island of Sao Vincente we will recover and deploy a tall mooring, named the Cape Verde Ocean Observatory (CVOO) on Monday and Tuesday. This observatory is in operation for more than 10 years and measures not only physical but also biogeochemical parameters, such as oxygen or carbon dioxide. The time during the transit was used to start examining the collected data of the cruise and start working on little projects in student teams. One group of students worked on the deep eddies forming at 10°S off the Brazilian coast. Another group worked on the distribution of Chlorophyll in the water column. The results will be discussed tonight in our weekly science seminar.

Last week finished (Sunday 10<sup>th</sup>) with a short interruption of our work at the PIRATA buoy at the equator at 0°N und 35°W. This buoy is part of the efforts of the international climate sciences and measured atmospheric and ocean parameters. Additionally to a visual inspection of the buoy we took the opportunity to fish nearby. Several keen participants engaged with their gear and some fish were brought to the deck of METEOR. Yesterday night we held our farewell barbecue, to celebrate the successful work of the past three weeks.



Mahi-Mahi and the science ,METEOR Choir' during the "Grillfest" (Photo: M. Visbeck)

We will finish our work on Tuesday afternoon and arrive on Wednesday in the port of Mindelo.

The mood on ship is excellent, the food wonderful and the collaboration with the captain and the crew fantastic.

With many regards from 16° 6.36' Nord und 26° 9.14' West,

Patricia Handmann and Martin Visbeck and the crew of the expedition M159.

GEOMAR Helmholtz Centre for Ocean Research Kiel



*Group photo of the M159 science crew. (Photo: D. Ude)*