

SONNE 305-2 E-POLIO & M2ARGO

Singapur- Port Louis, 16.07.-05.08.2024

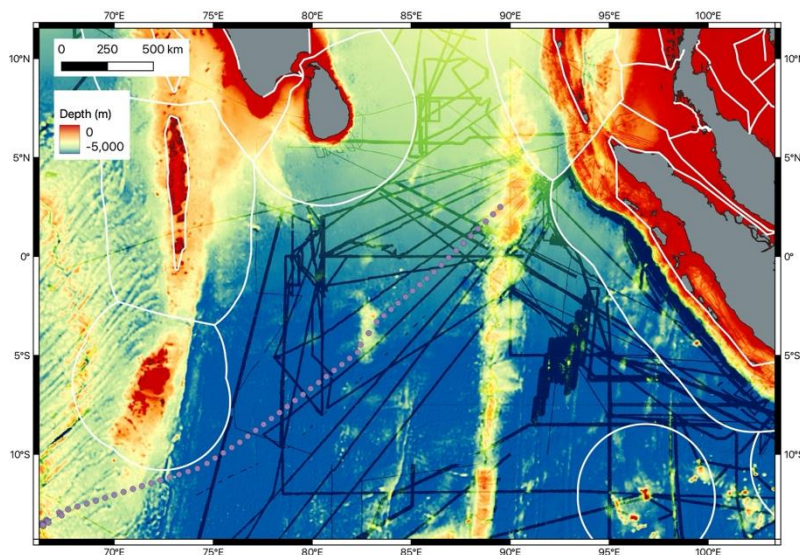
2. Weekly Report

22.07.-28.07.2024



The delayed start of the expedition has almost been forgotten. After reaching the international waters west of Indonesia on 21.07, we immediately began our work in the water column and the atmosphere. For the pollutant investigations along the route, samples are taken from the surface water every 30 NM in order to analyze our whole range of parameters. These include inorganic nutrients, dissolved and particulate carbon, chlorophyll a, polycyclic hydrocarbons, PFAS, nitrogen compounds (isotopes), UV filters, hormones, DOM, trace metals and microplastics. At selected stations, we used CTD to collect data from the entire water column. The CTD is equipped with two sensors each for temperature, conductivity/salinity and oxygen as well as an UVP. These instruments scan the water column and record hydrographic data. With 24 water samplers, each holding 10 liters of water, we take samples from the bottom water to the surface. The samples are filtered on board and transported to the home laboratories of the various institutions for analysis. The physical measurements on board showed us the different water masses of the Indian Ocean. One of our research goals is to study these and to investigate the mixing of the water masses of the northern and southern hemisphere, which takes place between the equator and approximately 20 °S.

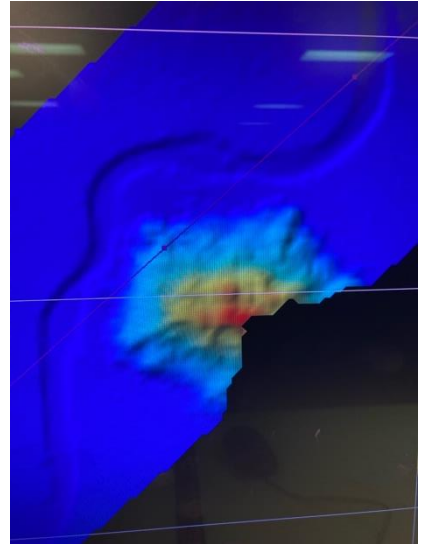
Our hydrographic work proceeded without any problems and all took place under good to very good weather conditions. This measurement program in the water column is supplemented by sampling in the air on deck using high-volume air samplers. The air samples are also analyzed for pollutants such as PAH, PFAS and microplastics. We have now arrived at 11°S, 71°E and are expected to reach the M2ARGO working area tomorrow morning.



Since leaving the Indonesian EEZ, SONNE has been mapping the seafloor with its newly refurbished EM122 multibeam echosounder. We are on a long transect across the world's least-mapped ocean and so every piece of information that we can collect about the depth of the water and the acoustic nature of the seafloor is extremely valuable. The map shows our route (brown dots) plotted on a map of estimated water depth (derived from gravity measurements and so not true ocean depths) as colours, with regions which

have already been mapped marked by a dark overlay (the dark bands crossing the ocean). The map immediately shows two things - (1) less than 5 % of the Indian Ocean floor has ever been mapped and (2) over 90 % of our track will investigate seabed that has never been imaged before. We will add the data we collect to the freely available international compilation of depth measurements hosted at the Seabed 2030 project, providing another dark band for this massive mapping project.

But why map the seafloor? The geological history of our planet is recorded there, including information about ancient and recent events that is not available anywhere else! An example is shown on this image, a picture of the online readout from the multibeam echosounder at around 84°E. It shows an underwater erosion channel (probably caused by a sediment slide flowing down the flank of the Bengal Fan from the Ganges delta) running around a partially buried seamount of unknown age (or provenance). Both of these features were unknown before we mapped them, some of many we have discovered on this cruise to date.



The atmosphere on board is very good and we are well supported by the ship and we feel very welcome on board.

With best regards from on board to all those who stayed at home

At sea, 28.07.2024

Joanna Waniek