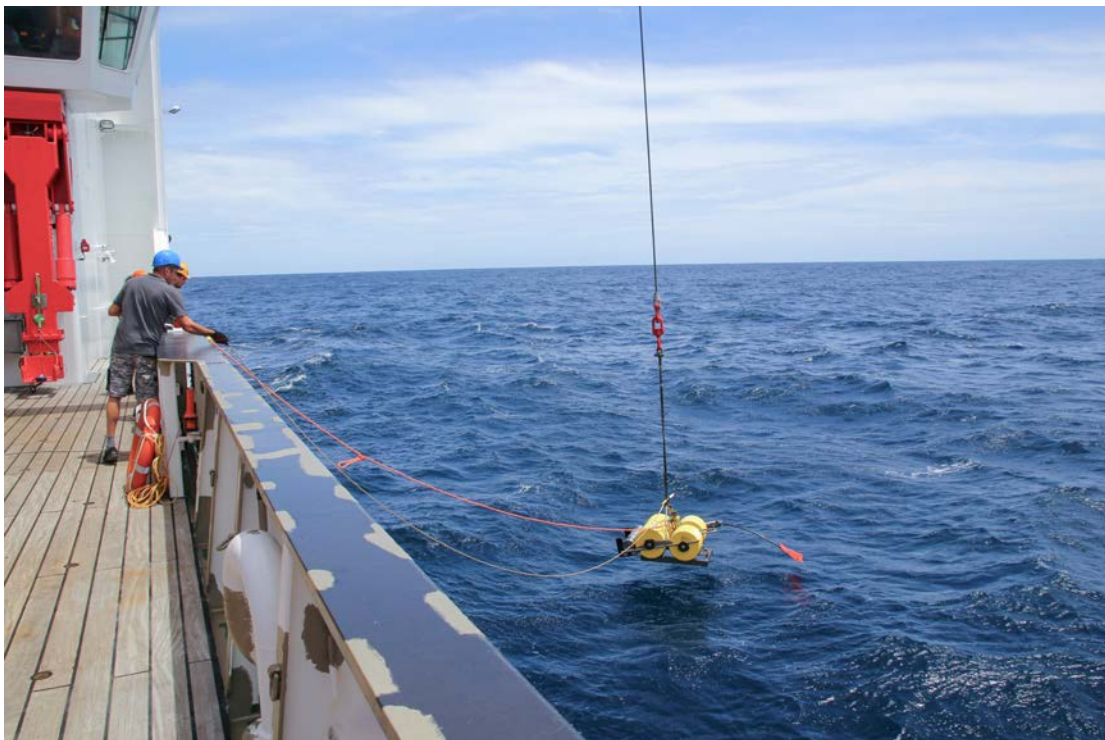


SO258 Leg 2
INGON
2nd Weekly Report
(17.07. – 23.07.2017)



RV SONNE
3°41'S / 81°00'E

Today is our 11th day at sea. Until now we conducted already quite successful measurements. At the beginning of the week our focus was still the mapping of the Earth's magnetic field and especially its components frozen in the oceanic crust. Also we continued the measurements of the gravity field and the seafloor. In the afternoon of July 17 we reached our southernmost point slightly south of 11° S. On the way to the south the weather had become worse. A strong high-pressure field south of our working area was responsible for wind up to strength of Beaufort 9 and high waves. Therefore we decided to turn to the East. At 81° E we turned to North towards to our second profile. The longitude 81° E became our fixed meridian for the rest of the week. Along our way to the north we collected very good data with all running systems, even if there were still fresh winds and waves around us. The weather did not affect our well-behaving and the mood on board. In the course of Thursday we crossed the equator for the second time. Contemporaneous with the on-going measurements we also continued with the preparation of the seismic equipment. Ocean-bottom seismometer stations we fixed, data loggers got programmed and the internal clocks were synchronized with GPS.



Deployment of an *ocean bottom seismometer* at 81° E longitude.
(Photograph: Konrad Behnke)

Other people continued to prepare the air guns, electric cables and pressure hoses. The air guns are the sources of seismic waves that can be used to investigate the structure of the Earth crust.

In the night towards July 21 we stopped the magnetic measurements with the towed system at 3° N. The tow fish was recovered. We then started to deploy 30 ocean-bottom seismometers (OBS) along the northern profile section up to the southern shelf break of Sri Lanka. At first the nautical officers have to park RV SONNE at the defined deployment position. Then the deck crew with support from the scientists deploy the instruments into the water. After an instrument is slipped it falls freely to the ocean floor. There the OBS should record acoustic and seismic signals continuously over the upcoming days. The OBS have hydrophones and seismometer/geophones as sensors. More or less every 60 minutes we reached the next deployment site. Early in the morning of July 22, we deployed the last OBSs in the area of the Traffic Separation scheme and north of it. At that time, there were not only the large container carrier, war ships and tanker vessels, but also many small fisher boats. The nautical officers had to carefully navigate RV SONNE through all that traffic. Just before the sunrise we could see the lights along the Sri Lankan southern coast, not far away. After the deployment of the last OBS the vessel went slightly to the east to reach the deployment position for air guns and the magnetometer. Going with slow speed against the currents, the deployments went without problems. Unfortunately, the 3000 m long hydrophone cable (streamer) could not be prepared in time to be used along the first profile.



*Last preparations for the seismic measurements.
(Photograph: Konrad Behnke)*

Already before and during the deployment, whales, in most cases pygmy blue whales, visited us. This type of whale is residential in the northern Indian Ocean and especially in the waters surrounding Sri Lanka. Seismic measurements in an area well-known for its richness on marine life and especially various types of whales and other fascinating fauna should not be undertaken without the support by experienced observers and specific mitigation procedures. For us as marine scientists the life above the seafloor is as important as things hidden beneath the seafloor. Therefore, we try to minimize the impact of our measurements on the marine life. That is in line with accepted international guidelines. We increase the intensity of our seismic signal over a period of 20 to 40 minutes to give the whales and other animals the possibility to leave the area around the vessel. Additionally, two independent marine mammal observers from Gardline Geosurvey Limited and one local expert from Sri Lanka supervise our measurements.

After we just had reached the full power and went on profile, one whale surfaced close to the vessel. According to the guidelines we had to stop the air guns immediately. We continued on profile towards the south throughout the traffic separation zone without a seismic source signal. Following a period of quiescence we started a second time, again with reduced signal strength. This time no whale surfaced in the vicinity of the vessel, so that we could continue our seismic measurements after reaching full power. Interestingly, there were many whale sightings all over the day, but all whales stayed out of the pre-defined mitigation zone. Also today there were sightings of whales, but also of Manta rays and flying fishes. We also get visits by birds on RV SONNE.



*Two pygmy blue whales close to the shelf break south of Sri Lanka.
(Photograph: Emma Hayes)*



There are not only swimming but also flying visitors to RV SONNE to look what we want to discover in the central Indian Ocean.

(Photograph: Menaka Goonewardena)

We still enjoy the tasty meals from the kitchen and the very friendly guidance and support by the whole crew. Today, as special point for a Sunday, Dieter - the chief of the engine - took a part of the scientific party to the lower decks. There he explained us, what drives this amazing research vessel.

With best regards from the Indian Ocean

Wolfram Geissler and the SO258/2 Science Party