MICRO-fate

MORE-2

SO 268/3

2. weekly report (6/3 – 6/9)

The RV Sonne science cruise from Vancouver, Canada to Singapore involves two projects: MICRO-FATE and MORE-2. MICRO-FATE investigates the distribution of plastic in oceans, from large accumulations down to decayed and degraded microstructures. Its goal is to capture for the northern Pacific near 30N the longitudinal and vertical distributions in the northern Pacific, including the sampling of sediments on the ocean floor. MORE-2 samples reference data over oceans in support of satellite remote sensing and global modeling and deploys 21 US ARGO floats along the way.

After completing the reference data sampling at profile station #1 at 39.5N/136W on June 1 the SONNE proceeded to the „garbage patch“ region (30-35N und 140-145W). According to simulations with ocean models, this the oceanic region has globally one of the largest concentrations of oceanic litter. We all were very excited and curious, what to expect. However, all of us, who expected small litter islands or even litter mountains, had to be disappointed. Such litter accumulations were never sighted - neither when crossing the entire garbage patch region from profiling station #2 on Juni 4 at 34N/144.5W to profiling station #3 on Juni 6 at 30N/141.5W nor later when proceeding out of the grabage patch westward to profiling station #4 at 30N/152W on Juni 8. However, the count of drifting litter and plastic in surface waters was strongly elevated in the garbage patch. And during the extended profiling stations on June 4 and 8 it was fairly easy to collect litter that was passing next to the ship. Figure 1 presents examples of catches, which often provided a home for muscles, crabs and jellyfish.

Figure 1. Catches of drifting litter and plastic next to the vessel during the profiling station stops with a coarse fishing next and a finer casher and its entire catch during profing station stop # 3

During the day-long profiling stations the ocean floor was investigted and probed. Visual images were offered by an underwater camera and a Multi-Corer took 20 samples of the upper 50cm of the ocean floor. First impressions of ocean floor probes below the garbage patch are presented in Figures 2 and 3.

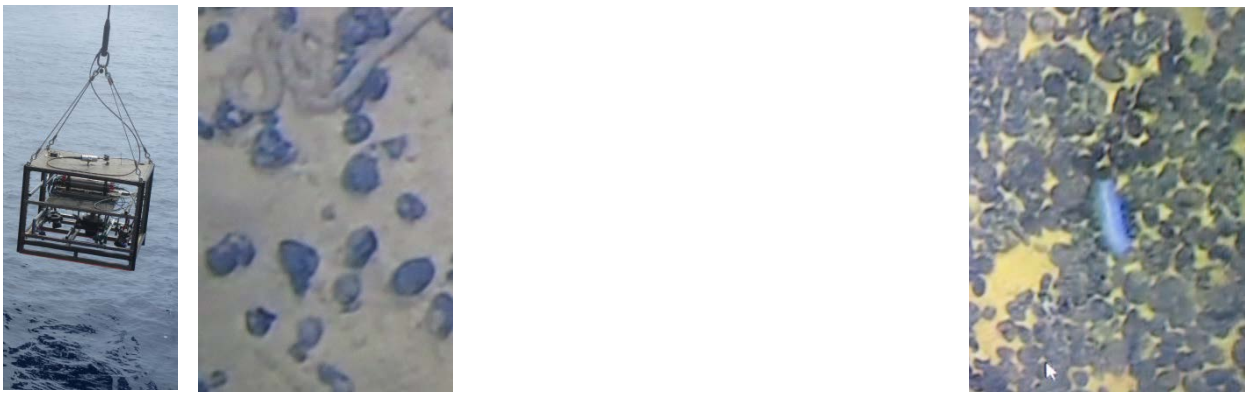

Figure 2. The OFOS Kamera-system und images of the ocean floor with the help of artifical light. Even a ca 40cm large fish (center) was seen over a several hour period. The density of Mangan-Rocks at the ocean floor was unusually high at the profiling-station #3 (right).

The camera images also showed, that even at 5000m depth the is life and large fishes do exist. The images also revealed that the ocean floor is littered with (black) Magan rocks, in different densities and sizes. The ocean floor under the garbage patch is composed of brown clay, much more adhesive and tougher than the white sand sediment probed during MSM82-2 transit off Marocco last month.

Figure 3. Der Multi-Core Sediment Collector before and after a deployment and the separation of a core's upper 10 cm, which here contains small Mangan-rocks, for future examinations in laboratories

In the framework of MORE-2 four ARGO-Floats were deployed. Due to extensive cloud cover, however, there is not too much to report on atmospheric reference data. We are hopeful that this is going to change during the next weeks.

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