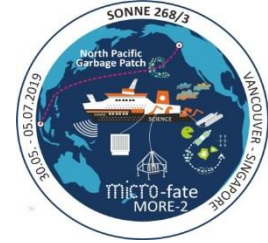


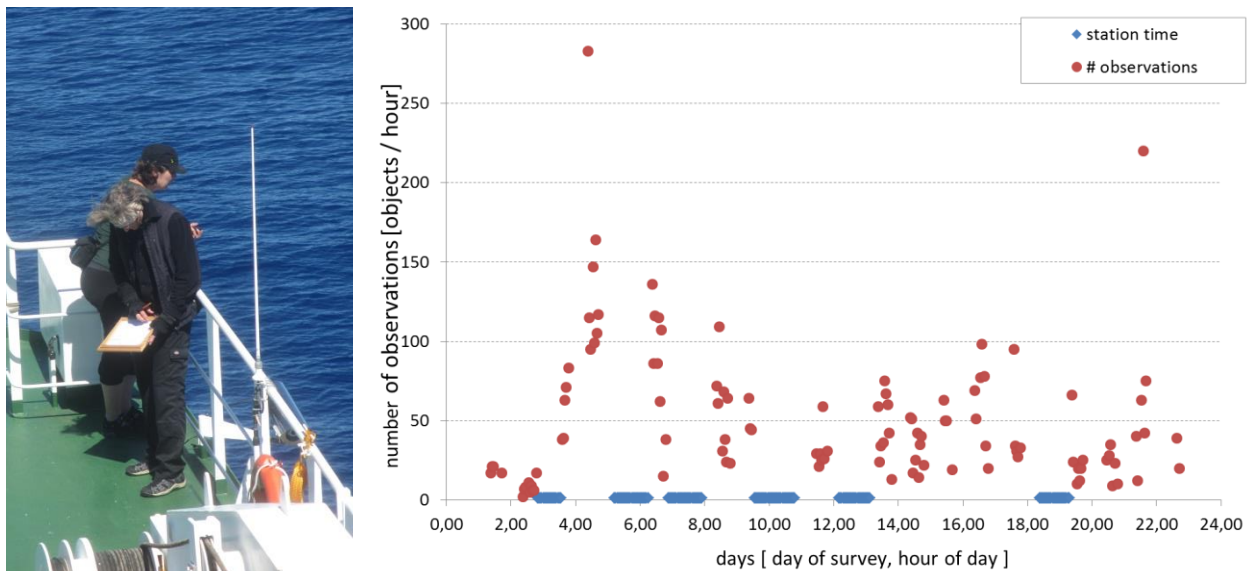
MICRO-fate  
MORE-2  
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#### 4. weekly report (6/17 – 6/23)

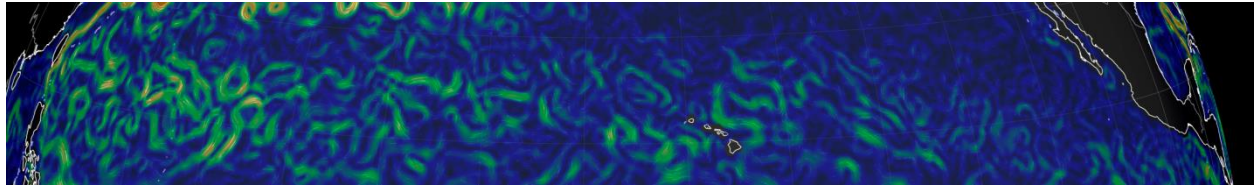
The RV Sonne science cruise from Vancouver, Canada to Singapore involves two projects: MICRO-FATE and MORE-2. MICRO-FATE investigates the distribution of plastic in oceans, from large accumulations down to decayed and degraded microstructures. Its goal is to capture for the northern Pacific near 30N 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.

This week we stopped for another extended profiling station with images of the ocean-floor and sediment samples at 30N/171E (now already west of the dateline). Also all remaining ARGO floats were deployed at longitudes as requested by the Scripps Institute of Oceanography, which provided the floats. Aside from these station activities also data from continuous observations were collected and some highlights are presented in this report. A survey of oceanic litter had alternating teams of two scientists counting passing objects floating within about 10m of the vessel. Counted objects (at non-station times during day) are summarized as a function of time in Figure 1.



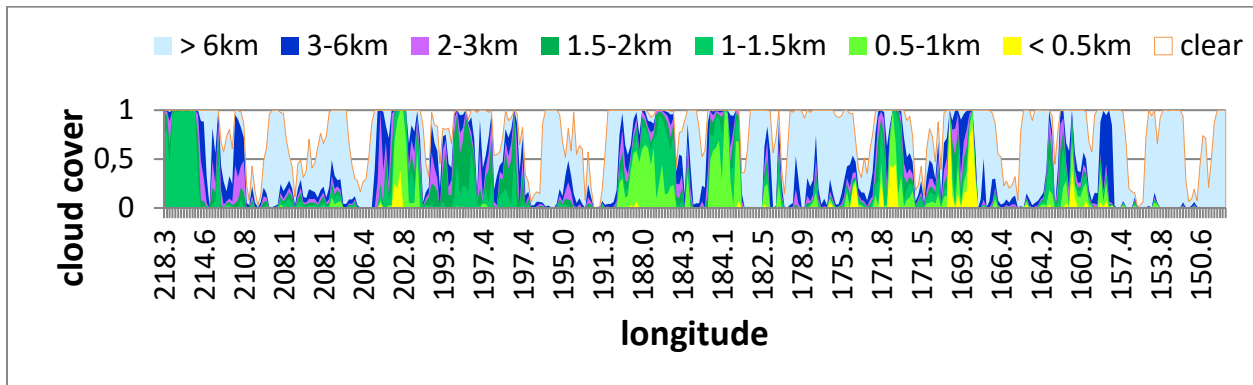
**Figure 1.** Counting ocean litter passing the vessel from the upper-deck near the front of the ship (left) and a first summary of registered counts as a function of time between May 30 to June 21 (right)

Maximum counts (of ca 10 to 50 objects per 10 min period) in Figure 1 are displayed near the garbage patch region (day 4 to 8). When proceeding westward near 30N from 200E (day9) to 155E (day22) litter counts were lower but stayed well above background levels (day2) and were highly variable even within hours (with 3 to 20 counts per 10 min period). Some explanation for the strong local variability is provided by the mesoscale features of oceans currents in that Pacific region, as illustrated in Figure 2.

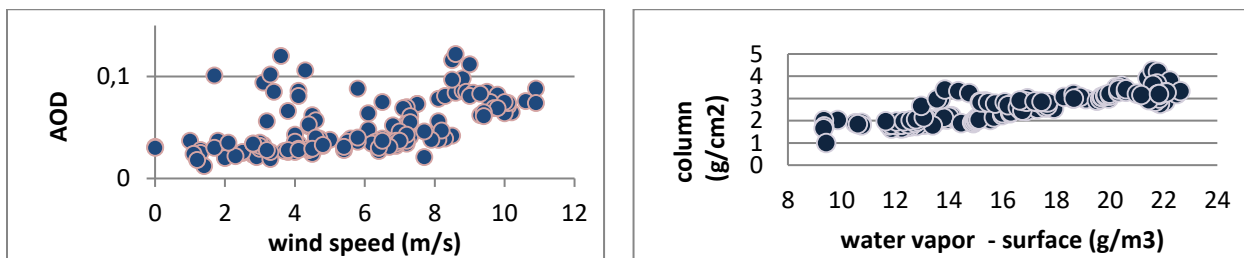


**Figure 2.** Image of mesoscale ocean current features (EC Earth 2019-06-22 at 22:47)

Under the MORE-2 Project, atmospheric properties were sampled. As illustrated in Figure 3, frequent cloud cover limited the sampling of reference data for aerosol and trace-gases. Still from the available data, first associations are presented in Figure 4 for minimum aerosol loads (AOD) at different wind-speeds and water vapor comparisons between surface concentrations and loads in the atmosphere.



**Figure 3.** Cloud cover as a function of altitude (as seen by a ground observer) at 30N over the Pacific. Note the plots includes data from extended profiling stations at longitudes of 208, 196, 186 und 171 E.



**Figure 4.** Associations between hourly averages for Aerosol Optical Depth (AOD, for aerosol amount) and surface wind speed (left) and for water vapor of the atmosphere and at the surface (right).