2. weekly report SO226-2 CHRIMP

Indication for thermogenic gases in the near-surface sediments of working area 1 could not be substantiated during the second week of our cruise. Instead, most of the porewater profiles show an almost vertical trend in sulphate concentration (Fig. 1), which suggests that the sulphate-methane transition is way beyond 10 meters subseafloor depth and the vertical methane flux consequently nonexistent. These results are in opposition to the seismic data that show clear evidence for vertical fluid migration. This fluid flux, however, must have stopped quite some time ago and most probably was already no longer active during the last glacial cycles. The lack of a methane signature in the near-surface sediments is quite remarkable as the overlying water masses do show signs for high primary productivity (clear zooplancton layer in water column data, abundance of fish and seabirds). Degradation products of this primary productivity, however, do not seem to be preserved in or even reach the sediments. Following the coring program, we also had a closer look at the seafloor using the OFOS video sled for a profile over the coring locations. This video transect showed that the sediments, especially at the bottom and the western flanks of the depression, are already well indurated (Fig. 2), which, in hindsight, explains our difficulty to core these locations.

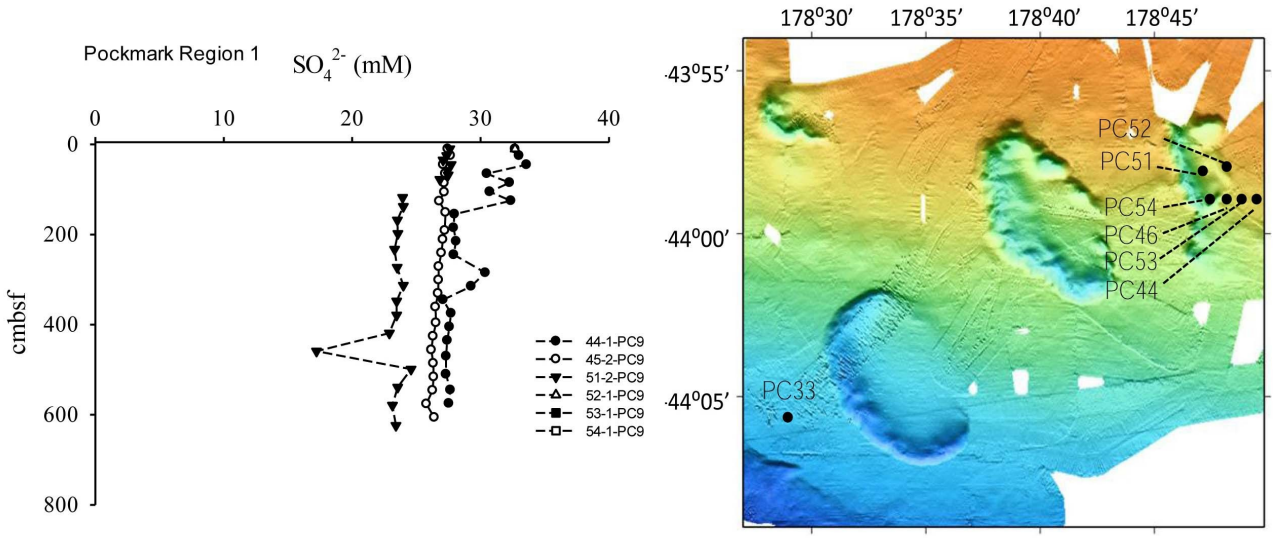
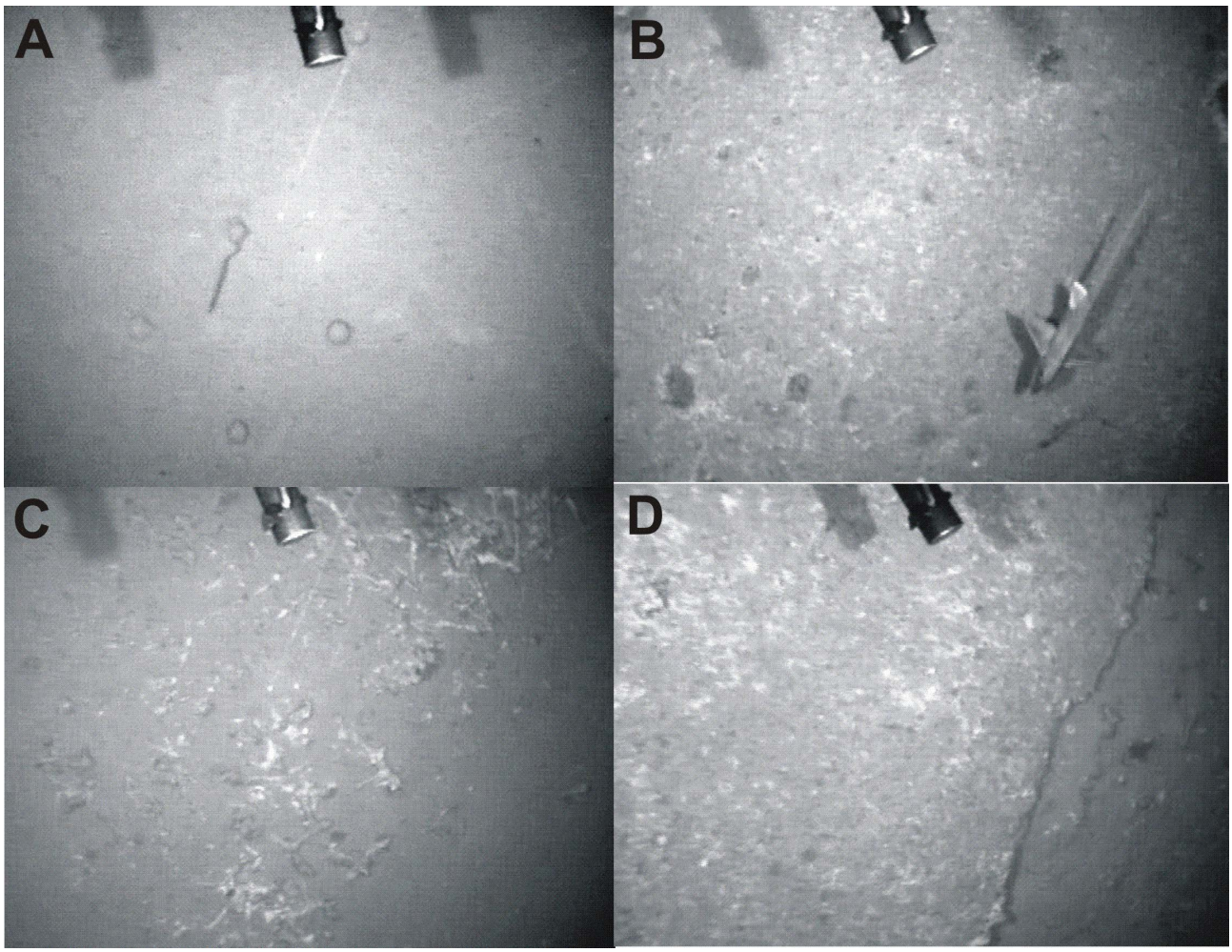


Figure 1: Sulphate concentration in the porewater of sediment cores from within the northeastern large seafloor depression.

During the second part of the past week we concentrated our efforts on the second working area that is located slightly further to the West. We started with a sidescan survey, but, although seismic indications for vertical fluid migration are even stronger in this area than in working area 1, the sidescan sonar failed to show any signs of increased backscatter intensity and hence no sign for active or recent fluid venting. Intensive coring of the area confirmed this first impression. Here again, pore water profiles did not show methane and the slight decrease in sulphate again points to sulphate-methane transition in greater subbottom depth. Fluid venting and the dissociation of gas hydrates seem to be unlikely the origin of the large seafloor depressions on Chatham Rise. In order to look for alternative explanations, we will start a short mapping program before turning our attention to the third, westernmost and shallowest working area.

Figure 2: OFOS images of the seafloor for a profile running across the northeasternmost depression in figure1. It shows a relatively soft sediment infill (A. Note the imprint of the multicorer) and hard, already well indurated sediments at the bottom and western flank of the depression (C-D).



Everyone on board is doing well.
Best regards on behalf of all cruise participants,

Ingo Klaucke
Chief Scientist