POS534 cruise to Goldeneye, North Sea (1.05.-29.05.2019)

1st weekly report

Cruise aims

The POS534 research cruise relates to the EU project: "Strategies for Environmental Monitoring of Marine Carbon Capture and Storage" STEMM-CCS. The cruise should provide contributions to the main aims of STEMM-CCS (i.e. WP 4, http://www.stemm-ccs.eu/work-packages):

(1) Develop and test new sensitive and robust subsea monitoring technology, which is indicative for subsea CO_2 leakage; new technology like optodes, membrane inlet mass spectrometry, active acoustics for identification and quantification of gas leakage.

(2) Tests are conducted under a controlled CO_2-release experiment at Goldeneye in the Scottish North Sea (https://www.youtube.com/watch?v=FteAvILEvzk).

(3) Porewater geochemistry, benthic flux measurement, pelagic water column monitoring provide data for quantitative interpretation of CO_2-induced biogeochemical changes by numerical modelling to improve best practice guides for CCS integrity monitoring.

(4) Hydroacoustic water column imaging and atmospheric CH_4 and CO_2-measurements above abandoned wells in the North Sea provides statistical sound carbon flux estimates from "leaky wells" into the North Sea and atmosphere.

The investigations at Goldeneye are conducted by two research vessels in parallel, the German RV Poseidon and the British RRS James Cook, to join forces on site during the CO_2 release experiment.

Mobilization and transit to working area

Mobilization of POS534 cruise started with two days of establishing analytical devices and monitoring technology in the laboratories of the research vessel on the 29th-30th of April at Ostufer, Kiel (Fig. 1).

Fig. 1a: Lander, Multicorer and two CTDs still have to be loaded (courtesy of M. Schmidt).

Fig. 1b: RV Poseidon in front of GEOMAR (courtesy of Saskia Elsen).

1st of May, when Kiel was still asleep, we started our cruise with first calibration procedures in the "Stoller Grundrinne" by using a new Kongsberg ADCP/Echosounder device installed in the moon

pool. After having made a few mechanical adaptions the hydroacoustic monitoring quality was excellent and we started our transit to Hirtshals (DK), where two engineers of Kongsberg (Simrad) left us (Fig. 2). Of course most of the scientific crew members got an intensive drill on the new software and hardware handling for the ADCP/ES and the WBAT/ES system, which is mounted to a video-sled.

Fig. 2: Per Inge and Sverre, two engineers from Kongsberg disembark RV Poseidon (courtesy of P. Linke).

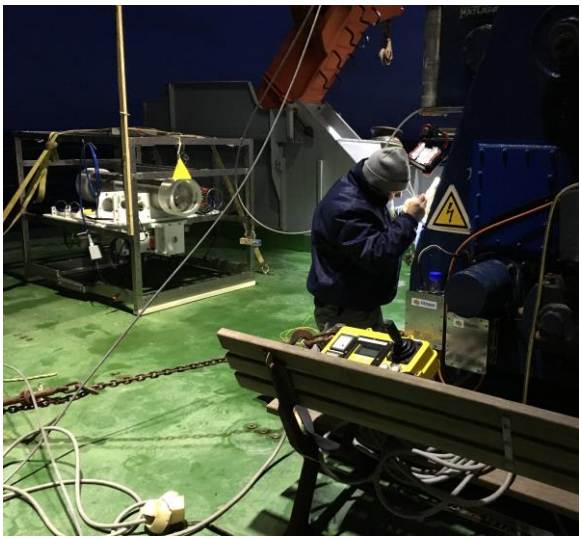

Fig. 3: Sergiy the video-engineer is fully concentrated when testing the winch fiber cables needed for video-sled operations (courtesy of P. Linke).

Although highly motivated and reasonably adapted to the motion of the sea we had to face our first heavy storm in the central North Sea coming from North-West. This forced us to stay a bit south of Kristiansand until Monday, the 6th of May. Time was used e.g. to work on a broken fiber cable connection of the deep-sea winch on the aft deck (Fig. 3). Nevertheless, we are now heading towards a set of abandoned oil/gas wells to start with the planned leakage monitoring during transit in the Norwegian and British sector, respectively.

We are expecting to arrive at Goldeneye on Thursday morning. Though a new storm event is forecasted for this time and area. Hope that weather forecast will change within the next 24 hours.

On behalf of all scientific crew members,

Dr. Mark Schmidt (PI)

p.s. One can follow two blogs about the “Goldeneye”-campaign at

http://www.oceanblogs.org/pos534/

https://stemmccs.blog/