

ASP PROJECT SUMMARY

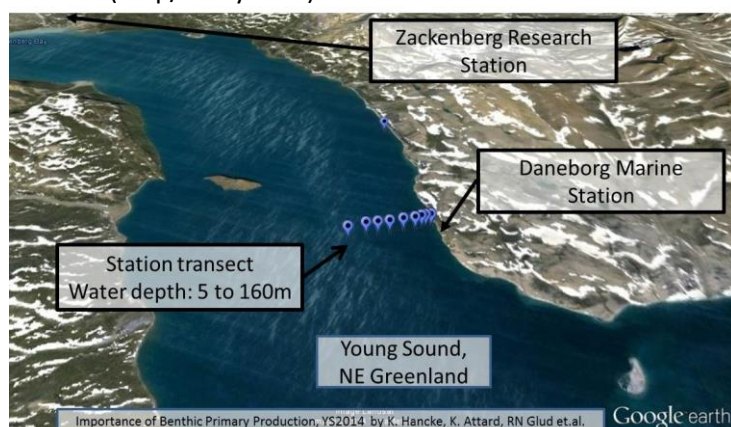
Name of all actual participants listed by institution	SDU : Kasper Hancke, Karl Attard and Ronnie N Glud AU: Mikael Sejr, Tage Dalsgaard, Egon Frandsen
Actual field work start / end dates	22. July – 12 August 2014
Actual field work site	Daneborg, Zackenberg Marine biological Station
Number of man-days used in field (specify for participants)	Kasper Hancke, 21 days Karl Attard, 21 days

Short summary, main achievements and difficulties encountered during field season (150 - 250 words)

The fieldwork was successful and the campaign was carried out according to the project description. Applying the non-invasive aquatic 'Eddy Correlation' (EC) technique we quantified the seafloor net oxygen production and consumption as a function of irradiance and depth, covering a transect located outside the Daneborg field station at water depths from 5 to 160 meters. In total, 13 deployments were completed. Besides continuous benthic O₂ exchange rates, each deployment contained 24 to 48 hours of data of bottom water O₂ concentration, current velocity, temperature, salinity, chlorophyll fluorescence and light availability. Sediment characteristics, microalgae chlorophyll concentration and presence of benthic fauna were described from sediment core samples and high-resolution underwater images. We found, that seafloor microalgae sustained a net O₂ production to depths of ~30m during the day, and that sufficient light was present to drive gross photosynthesis at depths of >40m. These preliminary results support that seafloor microalgae are important for the carbon turnover in the coastal region of the High Arctic and that seafloor net primary production contribute to the system net productivity to water depths of 20 to 30m, even when integrated over 24 hours. At depth >60m the benthic community O₂ consumption transiently decreased with increasing water depth, as demonstrated using in situ 'EC' measurements. Combining with laboratory O₂-microprofiles and digital images of the fauna abundance, our preliminary analyses suggest that the abundant fauna plays a significant role for O₂ turnover and carbon mineralization at the seafloor, not least below the photic zone.

Photos (1 – 3 relevant photos in high resolution. Attach all photos as individual files)

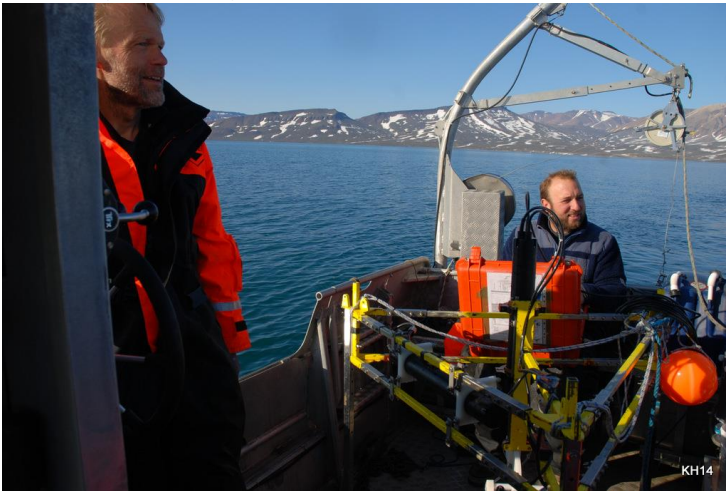
Photo 1 (map/study area)



Credit: K. Hancke & Google Earth

Caption: Field site outside the Daneborg Marine Station in Young Sound, Greenland.

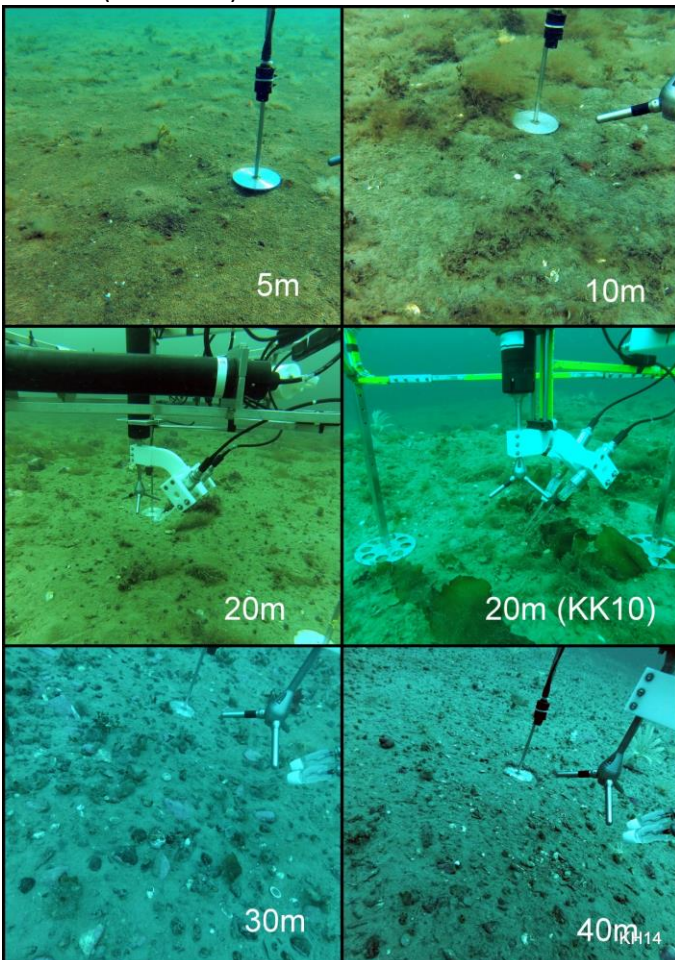
Photo 2 (field work)



Credit: K. Hancke

Caption: Deployment of the 'Eddy Correlation' lander (yellow frame) from R/V Aage V. Jensen in Young Sound, by Karl Attard, Kasper Hancke and Tage Dalsgaard.

Photo 3 (field work)



Credit: K. Hancke and K. Attard

Caption: Under water images of the seafloor including parts of the 'Eddy Correlation' lander, at deployment sites within the photic zone.

Acknowledgements (funding agencies, etc.)

We acknowledge funding from the Commission for Scientific Research in Greenland (GCRC6507) and the Nordic Center for Earth Evolution (NordCEE) at the University of Southern Denmark (SDU).

Other (if you wish to make other comments/remarks)

We wish to thank Egon Frandsen for extraordinary logistical support that helped the completion of this campaign.