

CRUISE REPORT 1

CAGE17-1-Leg 1 Cruise

Water column observation from CTD and water
samples west of Prins Karls Forland, Svalbard

on R/V Helmer Hanssen, May 15th – May19th

2017

by Tine L. Rasmussen on behalf of Helge

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Acknowledgements:

Steinar Iversen and Bjørn Runar Olsen contributed with data processing and handling of acoustic CTD equipment connected with this cruise. All cruise participants contributed to the collection of the data. They are all warmly thanked for their great contribution to make this cruise a great success.

This report was finalised on July 30th 2017.

1. Summary

From the afternoon of May 15th to the afternoon of May 19th, CAGE-Centre for Arctic Gas Hydrate, Climate and Environment, the Department of Geoscience UiT, the Arctic University of Norway, arranged a scientific cruise to survey offshore Prins Karls Forland, Svalbard to perform CTD measurements and water sampling on R/V “Helmer Hanssen”. The purpose is to study the variations in methane release and its dependence on oceanographic changes. The area has been continuously surveyed for the last three years for methane concentration, and methane consumption by bacteria and other related data. Because of the good weather conditions time allowed survey of the outer part of the shelf west of Prins Karls Forland – the so-called ‘Masox area’. Here three CTD’s were taken and the area surveyed by echosounding (EK60), chirp and multibeam for combined flare survey (EK60) and geological recording of sedimentary environments (chirp and multibeam).

A total of 69 CTD (conductivity-temperature-depth) casts were performed with 12 water bottles sampled for each CTD station.

2. Participants

Scientific crew:

Participants	Affiliation
Rasmussen, Tine Lander (Professor; chief scientist)	UiT
Helge Niemann (Professor II; co-chief scientist)	UiT
Bjørn Runar Olsen (Engineer)	UiT
Steinar Iversen (Engineer)	UIT
Friederike Grundger (Post doc)	UiT
Fatih Sert (PhD student)	UiT
Pavel Serov (PhD student)	UIT
Pär Jansson (PhD student)	UIT
Vincent Carrier (PhD student)	UIT

3. Equipment

Water properties:

- CTD (Seabird 911 Plus) with compact rosette with water samplers

Acoustic equipment

- Kongsberg Maritime EM 300 multibeam echo sounder
- EdgeTech 3300-HM hull-mounted sub-bottom profiler ("Chirp"); 4*4 arrays
- Kongsberg Maritime EK60 splitbeam echosounder (18, 38 and 120 kHz)

Methods

Water properties

The water properties – temperature, salinity – were measured off Prins Karls Forland, using a *Seabird 911 Plus* CTD. Data collection was performed during down casts at a speed of approx. 1.0 m/s. The data of selected CTD stations were used for records of modern water mass properties. Water samples (12 bottles per CTD cast) were taken for measurements of concentration of methane, methane consumption by bacteria and other parameters.

After the departure from the first survey area off PKF, soft starts of the Chirp system were performed outside of the 12 nm zone at 350 m water depth on the evening of the 17th of May, starting with 1% of the total effect, followed by a doubling of the effect every minute.