

## [ICES/PICES 6ZPS 2016/S1](#)

Comparing multi-net sampling with optical measurements: how efficient is LOKI (Lightframe In situ Key species Investigations) in analysing zooplankton communities in the Fram Strait?

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Optical measurements are increasingly important in zooplankton studies as they allow for covering wide spatial ranges and study the distribution of the dominant taxa in greater detail than classical net ~~two~~stows. The plankton recorder LOKI provides high-resolution pictures, continuously taken by a 4 Megapixel camera during vertical hauls from 1000 m depth to the surface. The build-in computer recognizes objects, i.e. particles and plankton organisms, and stores the respective clipping for later analyses. Linked to each picture, hydrographical parameters are being recorded, e.g. depth, salinity, temperature, oxygen concentration and fluorescence. This allows to exactly identifying distribution patterns in relation to environmental conditions, rather than sampling depth intervals of up to several hundred meters as is possible with multiple net samplers. ~~In order to~~ compare the community composition, abundance and depth distribution of the species in the Fram Strait between samples taken by LOKI and traditional multi-net hauls, we have conducted parallel sampling of zooplankton during an RV Polarstern cruise, deploying the LOKI and a Multi-net Midi (~~Hydrobios~~) at the same station. Both were equipped with nets of ~~400µm-150 µm~~ mesh size and vertically towed with 0.5 m sec<sup>-1</sup> from 1000 m depth to the surface. Our data suggest, that the abundances of dominant large taxa (Calanus, Metridia, ostracods) determined by LOKI mirror their abundance in net samples. Abundances of small copepods (Oithona), ~~Microcalanus~~ are, however, lower as are the abundances of fast swimming predators (chaetognathes, amphipods). These results will be discussed in the view of suitability for studies on zooplankton distribution and biodiversity.

Key words: Copepods, depth distribution, Arctic

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