

Ice algal and phytoplankton photophysiological measurements during the spring 2002 expedition.

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Description of sampling design and data set:

Water and ice samples were collected in the Chukchi and Beaufort shelves and slope regions during the spring 2002 SBI expedition onboard the USCGC Healy between May 10 and June 3, 2002. Stations are labeled by providing the complete date (YYMMDD, e.g. 020510 plus water or “brine and water”). A list referring ice station with Healy stations is given in the ice core data set on the same data server

(<http://www.eol.ucar.edu/projects/sbi/>) under the link: *Physical/Chemical/Biological Sea Ice Characteristics in the Chukchi and Beaufort Sea.*

Brine was collected with a bilge pump from sack holes that had been drilled down to within 5 cm of the bottom of the ice floes and was also stored in the dark in a cooler. A Kemmerer water sampler was deployed through one core hole and water from 5 m depth was collected for comparison with the ice physical, chemical and biological properties at each station. Additional water samples was taken at some stations from the CTD rosette sampler by Dean Stockwell. All samples were stored at a light intensity of $14 \mu\text{E m}^{-2} \text{s}^{-1}$ at -1 deg C for a maximum of one hour before analysis with a WALZ WaterPAM (pulse amplitude modified fluorometer). Rapid response light curves (RLC) were assessed using nine different actinic light intensities ($I=0$ to about $1000 \mu\text{E m}^{-2} \text{s}^{-1}$) and saturation pulse settings of 1 sec pulse length and 15 s pulse interval. Photosynthetic performance parameters were calculated according to Walz (2000).

The PAM data are provided within one Excel (vers X for MAC) spreadsheet separated in individual worksheets by location. The following list provides an explanation for the various table headers:

Station: date of the year

Sample: type of sample analyzed (water sample or brine)

Depth (m): depth, water sample has been collected from

F: fluorescence at given light intensity

Fm': maximum fluorescence after saturation pulse

Yield: calculated quantum yield (rel. units)

ETR: relative electron transfer rate

PAR: light intensity ($\mu\text{E m}^{-2} \text{s}^{-1}$)

Fo': minimum dark fluorescence

QP: Coefficient of photochemical quenching

QN: Coefficient of nonphotochemical quenching

NPQ: Parameter describing nonphotochemical quenching

A detailed description of parameters, variables, units can be found in Walz (2000): <http://www.walz.com/support/downloads/downloads/pdfs/WINCON1E.PDF>.

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