

Ice algal and phytoplankton photophysiological measurements during the spring 2004 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 2004 SBI expedition onboard the USCGC Healy between May 21 and June 21, 2004. A list providing additional information (e.g. station duration, location etc.) can be found at http://catalog.eol.ucar.edu/sbi/catalog_hly-04-02/station/.

Brine was collected by centrifugation of 5cm bottom segment of ice cores at close to in situ temperatures (see detailed description in metadata file for sea ice permeability measurements during SBI020 and 04). 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 were taken at some stations from the CTD rosette. 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 $300 \mu\text{E m}^{-2} \text{ s}^{-1}$) 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:

Date: date of sampling event (example 40521 = 21 May 2004)

Station: Healy station log number
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 ($\mu\text{E m}^{-2} \text{s}^{-1}$)
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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