

TITLE: BEST Copepod Integrated Grazing and Production Rates During Spring Process Cruises

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DATA SET OVERVIEW:

This data set contains integrated estimates of chlorophyll biomass and copepod biomass, grazing, and production for the BEST 2008, 2009, and 2010 spring process cruises on the USCGC Healy (HLY0802, HLY0902) and R/V Thompson (TN249). Cruise, tow number (Tow#), station number (Sta#), station name (StaName), date (TowDate), local time (LocalTime), net tow depth (TowDepth) in meters, position (latitude, longitude), bottom depth (meters), mean temperature in the upper 50 m (°C), integrated chlorophyll biomass in the upper 50 m, integrated copepod biomass, grazing rate, and production in terms of nitrogen from surface to the depth of the net tow, and *Calanus* spp. egg production rate are presented for each station.

METHODS:

- 1) The mean temperature in the upper 50 meters was determined from the CTD temperature traces at each station.
- 2) The integrated chlorophyll biomass in the upper 50 meters was estimated from measurements of extracted chlorophyll from depth stratified water bottle samples taken at each station by C. Mordy.
- 3) The integrated copepod biomass was estimated by combining the species/stage specific nitrogen weight values with abundance estimates of copepodids from integrated CalVet net tows (150- $\mu$ m mesh) at each station. All dominant copepod species were included in the analysis (*Calanus* spp., *Pseudocalanus* spp., *Metridia pacifica*,

*Neocalanus cristatus*, *N. flemingeri/plumchrus*, *Eucalanus bungii bungii*, *Acartia longiremis*, *Eurytemora sp.*, *Microcalanus sp.*, and *Oithona sp.*). This size mesh underestimates the biomass of early life history stages of the smaller species to some degree.

4) Copepod grazing rate was determined for each species at each location as a function of maximum chlorophyll concentration, mean temperature (upper 50-m), and body size (Campbell et al. submitted). These rates were multiplied by the stage-specific nitrogen biomass estimates at each station to obtain the integrated grazing rate estimates.

5) Copepod production (growth rate) was estimated from grazing rates assuming a 30% growth efficiency.

6) *Calanus* spp. egg production rate (EPR) for each station was determined from chlorophyll vs. egg production rate relationships determined for each cruise using the maximum chlorophyll concentration at each station. The integrated EPR was calculated by multiplying the EPR by the integrated *Calanus* spp. female abundance at each station.

#### REFERENCES:

Campbell, R.G., Ashjian, C.J., Sherr, E.B., Sherr, B.F., Lomas, M.W., Ross, C., Alatalo, P., Gelfman, C., Van Keuren, D. Mesozooplankton grazing during spring sea-ice conditions in the eastern Bering Sea. DSR II, Submitted.