

CTD data series for cruise Belgica BG9912 (17 to 21 May 1999)

Cruise Principal Scientist and Data Originator

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Content of data series

| Parameter | Unit | Parameter code | Number of casts | Comments |
|------------------------|----------------------|----------------|-----------------|----------|
| Pressure | db | PRESR01 | 53 | none |
| Temperature (ITS90) | deg. C | TEMPST01 | 53 | none |
| Potential temperature | deg. C | POTMCV01 | 53 | none |
| Salinity | PSU-78 | PSALST01 | 53 | none |
| Sigma-theta | kg m ⁻³ | SIGTPR01 | 53 | none |
| Dissolved oxygen | µmol l ⁻¹ | DOXYPR01 | 53 | see text |
| Oxygen saturation | percent | OXYSBB01 | 53 | see text |
| Optical backscattering | FTU | TURBPR01 | 53 | none |

Instrumentation and data processing by originator

CTD unit and auxiliary sensors:

Sea-Bird SBE09plus STD profiler fitted with an oxygen sensor and an optical backscattering sensor (D&A Company). The specifications of the STD profiling system were as follows:

| Parameter | Units | Range | Accuracy (guaranteed) |
|------------------|---------|-----------|---------------------------|
| Depth | m | 0 to 3000 | 0.1 % of full scale range |
| Temperature | EC | -5 to +35 | 0.01 EC / 6 months |
| Conductivity | S/m | 0 to 6 | 0.001 S / m / month |
| Dissolved oxygen | µmol/kg | 0 to 600 | 5 µmol / kg / day |

Change of sensors during the cruise: none reported.

The Sea-Bird SBE09plus STD system measures the depth of the sensor package, water temperature, conductivity and dissolved oxygen at a rate of 24 samples per second. These data were averaged in the Sea-Bird deck unit over a 0.5 sec. time interval.

Data were supplied to BODC as Seabird ASCII files including both downcast and upcast with a binning interval of 0.5 m.

Sampling device:

- Sea-Bird carousel water sampling system SBE32 equipped with 12 x 10L Niskin bottles.
- No reversible thermometer was used.

Calibration:

Salinity data as measured by the SBE09plus system were validated against salinity measured on water samples taken from various depths and locations. The water samples were analysed in MUMM's laboratory at Oostende using a Guildline Portasal Model 8410 bench salinometer calibrated against IAPSO standard seawater capsules obtained from Oceanographic Scientific International Lts. (UK).

BODC post-cruise processing and screening

Reformatting:

The data were converted into BODC internal format (PXF) to allow use of in-house software tools notably the workstation graphics editor SERPLO. In addition to reformatting, the transfer program

converted oxygen values from $\mu\text{mol kg}^{-1}$ to $\mu\text{mol l}^{-1}$ using the following equation:

$$\text{Oxygen } (\mu\text{mol l}^{-1}) = \text{oxygen} * (\text{sigma-t} + 1000) / 1000$$

Screening:

Reformatted CTD data were transferred onto a high-speed graphics workstation. Downcast and upcast channels were screened graphically using custom in-house graphics editors. It was observed that data from the upper 5 to 10 m of the downcast profiles were generally not reliable due to poor equilibration of the CTD unit. On the other hand data from the upcast profiles were of good quality on all casts. As a result it was decided to select the upcast CTD profiles for banking rather than losing information from the upper water column. If present, spikes and suspicious values were manually flagged. No data values were edited or deleted; flagging was achieved by modification of the associated quality control flag to 'M' for suspicious data, 'N' for null.

Banking:

Once screened on the workstation, the CTD upcasts were loaded into a database under the ORACLE Relational Database Management System.

Calibration:

The data had already been calibrated by the data originator and no further calibration/correction was applied by BODC.

Comments on data quality

Oxygen analyses were not performed during this cruise. The oxygen channel has not been therefore calibrated against *in situ* measurements and absolute values should be used with caution.