FACTSHEET: Hydrographic data from research surveys (Survey_CTD)

Version: [v1, 27/01/2023]

Sampling protocol: Survey_CTD

Sampling objective(s): data collection of hydrographic conditions (e.g. temperature, salinity) during research surveys at sea

Start of sampling: 1985 (International bottom trawl survey IBTS_Q1, International herring larvae survey IHLS, Mackerel egg survey MEGS), 1991 (Herring acoustic survey NHAS), 1998 (Beam trawl survey BTS), 2001 (Sole Net survey SNS_NLD, Demersal Young fish survey DYFS), 2004 (International blue whiting spawning stock survey IBWSS), 2018 (Downs recruitment survey DRS_NLD)

Sampling ongoing: yes

Data use

Primary data use: data vertical downcasts are used by hydrographers. Data from continuous measurements of temperature and salinity during the fishing activity are used by individual scientists in combination with catch data.

Sampling design and method

The locations of the sampling stations follow the design of the survey. For IBTS_Q1, BTS, DYFS, SNS_NLD, IHLS, MEGS, DRS_NLD a CTD measurement is done at every fishing location. During IBWSS and NHAS CTD samples are taken on regular intervals along the acoustic transects.

Reference to survey stratification:

- IBTS_Q1, BTS, DYFS, SNS_NLD Survey_dem
- IHLS, DRS_NLD Survey_plankton_NorthSea
- MEGS Survey_plankton_Atlantic
- NHAS Survey_acou_NorthSea
- IBWSS Survey_acou_Atlantic

Hydrographic samples at different depths are taken with a so-called CTD, an instrument measuring water temperature, conductivity, oxygen and/or turbidity at different depths through the instrument. The CTD measurements are conducted in two manners:

- Vertical profile: the CTD is lowered down to just above the bottom -or a specified maximum depth in deep areas and hauled up. A Seabird 911 CTD is used for this purpose, producing data with the accuracy hydrographers prefer. This method is used during IBTS_Q1, BTS, IBWSS, NHAS. Standard measurements are pressure, temperature and conductivity. Salinity is calculated based on temperature and conductivity.
- Continuous measurement during the sampling activity: the CTD (either the Seabird 911, a Valeport sonde or a Hydrolab sonde) is attached to the fishing gear and measures the parameters while fishing. This methodology does not meet hydrographic scientific standards, but the data are directly correlated to the catch conditions. During IHLS, DRS_NLD, MEGS a Seabird 911 is connected to the gear, measuring temperature and conductivity. Salinity is calculated based on temperature and conductivity. During SNS_NLD and DYFS in the coastal zone a Valeport CTD is used, measuring temperature and conductivity. During DYFS in Wadden Sea and Scheldt basins a Hydrolab CTD is used, measuring temperature, conductivity, oxygen and turbidity. Salinity is calculated based on temperature and conductivity.

Sampling protocol and data capture

In the field

The CTD from the Seabird 911 are directly stored at the computer on board, in files per station.

The files from Valeport and Hydrolab instruments are transferred daily from the CTD to the computer on board. The files per day are split into information per station using in-house developed split software.

All files are brought back to the institute and uploaded to the server.

Post-processing data
The Seabird 911 data are processed with SBE Data Processing software [step 1 (Data Conversion) and 7 (Bin average)]. The *.cnv files are transposed to the FRISBE database exchange format using a standardised in-house developed SAS script. After submission to the institute's database the data from the vertical profiles is extracted and transposed to ocean data view (ODV) format file for submission to the ICES oceanography database.

The split Hydrolab and Valeport data (*.csv files) are are transposed to the FRISBE database exchange format using a standardised in-house developed SAS script.

Data quality
Quality assurance procedure
Quality checks are conducted upon processing at the institute, and before entry into the national database FRISBE. Standardised SAS scripts are used for the data quality checks (available upon request). Essentially, the CTD data are checked for outliers on numerical values by providing minimum, mean, and maximum values.

Quality checked parameters
All hydrographic data collected is checked.

Data storage
National database: the CTD information is submitted to the national database FRISBE. The relevant aspects of this database are described in Proc_databases.

International database: the Seabird 911 vertical profile CTD data is stored in the ICES database Oceanography (https://www.ices.dk/data/data-portals/Pages/ocean.aspx)

Data availability
Institutional availability: accessibility of the national database FRISBE is described in Proc_databases, data is made available as soon as possible after the survey, mostly within 2 months after the final submission of the survey data to FRISBE.

Public availability: data submission to ICES Oceanography is done approx. every 6 months. Data made available in FRISBE in the past 6 months are submitted to ICES in the ODV format.

Reference to full documentation:
National manual: CVO_h_003: Damme, C. van, U. Beier, I. de Boois, D. Burggraaf, B. Couperus, R. van Hal, T. Pasterkamp, J. Vrooman 2023. Handboek bestandsopnamen en routinematige bemonsteringen op het water. Versie 17, maart 2023. CVO rapport 23.002

International manuals:
ICES Data and Information Group (DIG) (2006) ICES Guidelines for CTD data. (Compiled March 2000; revised August 2001; June 2006) Copenhagen, Denmark, International Council for the Exploration of the Sea (ICES), 9pp. DOI: https://doi.org/10.25607/OBP-1360

Review frequency full documentation: national manual is annually reviewed; the review frequency of the international guidelines is unknown
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