ICES Guidelines
for SeaSoar (Batfish) Data

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The Seasoar (or Batfish) instrument is a towed platform typically equipped with a CTD. Other sensors, such as fluorometers or transmissometers, may also be added. The SeaSoar has hydraulically controlled wings, which give it the ability to "fly" up and down in the water column. On a typical deployment, the SeaSoar is towed behind a ship at speeds of up to 10 knots using a faired cable while flying between two depths, Use of a faired cable reduces the drag on the cable and allows the SeaSoar to fly sawtooth profiles with a maximum depth of ~500m. Without fairing or with damaged fairing the depth capabilities of the SeaSoar are dramatically reduced. With no fairing at all the SeaSoar would struggle to attain 100m depth.

1.0 RECEIVING DATA

The Data Centres require the following information to be supplied by the data supplier together with the data. When receiving data, the Data Centres of the ICES community shall strive to meet the following guidelines.

1.1 Data standard

Data should be provided as time series (of 1-second averages) and should be merged with navigation data. If the navigation has not been merged, they should be submitted as a separate file, which could be linked to the SeaSoar data using date and time.

If data are not available in this form, then data split into 'pseudo-CTD' casts are acceptable. In this context, a 'pseudo-CTD' cast is defined as that part of the SeaSoar profile collected on the downward undulation of the instrument. It is also acceptable to provide data in a gridded form, for example, eight decibar vertical resolution and the horizontal resolution to match the wavelength of the SeaSoar oscillation through the water. The horizontal resolution of the gridding should allow for inclusion of two full oscillations of the SeaSoar through the water column. The method used for the generation of ‘pseudo-CTD’s’ should be fully described.

All parameters must be clearly specified and described. If parameter codes are to be used, then the source data dictionary must be specified. Parameter units must be clearly stated. Parameter scales must be noted where applicable. If computed values are included, the equations used in the computations should be stated.

All relevant calibrations should be applied to the data including laboratory and field calibrations. The data should be fully checked for quality and erroneous values such as spikes or gaps should be replaced with a suitable ‘No data’ value. An explicit statement should be made of the checks and edits applied to the data.

Sufficient self-explanatory information and documentation should accompany the data so that they are adequately qualified and can be used with confidence by scientists/engineers other than those responsible for its original collection, processing and quality control.

A brief description of the data calibration, quality and processing must be included and should contain information regarding:

- Laboratory calibrations (e.g. whether carried out in accordance with SCOR Working Group 51 recommendations. See also Karl (1996) and UNESCO (1991).)
- In-situ calibrations (e.g. lowering a separate, calibrated CTD before and after a SeaSoar deployment and then towing SeaSoar through CTD station, use of thermosalinograph, or water samples taken from the non-toxic supply)
- Report on corrections made to data especially for offsets in salinity due to fouling of the conductivity cell
- Time reported in UTC is essential
- Estimate of final uncertainty in the data

A brief description of the data processing procedures (manufacturers and in-house) must be included and should contain information regarding:

- Instrument Details
- Filtering, de-spiking or smoothing methods
- Editing or quality control methods
- Time lag correction scheme for temperature sensor
- Adjustments made due to variations in calibration

If a cruise/data report is available describing the data collection and processing, this can be referenced. If possible a copy should be supplied with the data.

1.2 Format Description

Data should be supplied in a fully documented ASCII format. Individual fields, units, etc. should be clearly defined and time reported in UTC. The contents of the data and ancillary information should adhere to the Formatting Guidelines for Oceanographic Data Exchange (http://ocean.ices.dk/formats/GETADE_Guidelines.aspx) prepared by the IOC's Group of Experts on the Technical Aspects of Data Exchange (GETADE) and available from RNODC Formats.

1.3 Collection Details

Other pertinent information to be included in the data transfer to the Data Centre includes:

- Project, ship, cruise identifier, SeaSoar deployment identifiers
- Country, organisation
- Date and time of the start and end of the SeaSoar run

- For data supplied as 'pseudo-CTD' casts; date, time, latitude, longitude, and an up/down cast indicator for each cast
- Details of the instrument and sensors (e.g. manufacturer, model number and any modifications carried out)
- Description of operational procedures including sampling rate, sensor resolutions, undulation rate, methods of position fixing (e.g. DGPS, GPS, etc.)

Any additional information of use to secondary users which may have affected the data or have a bearing on its subsequent use.

2.0 VALUE ADDED SERVICE

When processing and quality controlling data, the Data Centres of the ICES community shall strive to meet the following guidelines.

2.1 Quality Control

A range of checks are carried out on the data to ensure that they have been imported into the Data Centre's format without any loss of information. For SeaSoar data, these should include:

- General check of accompanying information (e.g. SeaSoar runs within cruise dates, correct cruise identifier)
- Automatic range checking of each parameter
- Plot navigation file to ensure no land points, no spikes and sensible vessel speed; compare with cruise report/CSR track chart if available
- Visual inspection of time series (or 'pseudo-casts') for all parameters supplied - this may include oxygen, transmittance or fluorescence, in addition to temperature and salinity
- Removal of spikes in data (or gridding artefacts), replacing with defined 'No Data' value.
- Flag suspicious data or correct after consultation with the data supplier
- Check corrections/calibration applied
- Compare with thermosalinograph data and calibration CTD casts if available
- Check available comparison with water bottle samples, and corrections/calibrations applied
- Compare with climatology

If the navigation data are supplied separately, they will be merged with the SeaSoar data at the Data Centre.

2.2 Problem Resolution

The quality control procedures followed by the Data Centres will typically identify problems with the data and/or metadata. The Data Centre will resolve these problems through consultation with the originating Principal Investigator (PI) or data supplier. Other experts in the field or other Data Centres may also be consulted.

2.3 History Documentation

All quality control procedures applied to a dataset are fully documented by the Data Centre. As well, all quality control applied to a dataset should accompany that dataset. All problems and resulting resolutions will also be documented with the aim to help all parties involved; the Collectors, Data Centre, and Users. A history record will be produced detailing any data changes (including dates of the changes) that the Data Centre may make.

3.0 PROVIDING DATA AND INFORMATION PRODUCTS

When addressing a request for information and/or data from the User Community, the Data Centres of the ICES community shall strive to provide well-defined data and products. To meet this objective, the Data Centres will follow these guidelines.

3.1 Data Description

The Data Centre shall aim to provide well-defined data or products to its clients. If digital data are provided, the Data Centre will provide sufficient self-explanatory information and documentation to accompany the data so that they are adequately qualified and can be used with confidence by scientists/engineers other than those responsible for their original collection, processing and quality control. This is described in more detail below:

- A data format description fully detailing the format in which the data will be supplied
- Parameter and unit definitions, and scales of reference
- Definition of flagging scheme, if flags are used
- Relevant information included in the data file (e.g. ship, cruise, project, SeaSoar deployment identifiers, start and end dates and times of SeaSoar run, etc.)
- Data history document (as described in 3.2 below)

3.2 Data History

A data history document will be supplied with the data to include the following:

- A description of data collection and processing procedures as supplied by the data collector (as specified in Section 1.1 and 1.3)
- Quality control procedures used to check the data (as specified in Section 2.1)
- Any problems encountered with the data and their resolution
- Any changes made to the data and the date of the change

Any additional information of use to secondary users which may have affected the data or have a bearing on its subsequent use should also be included.

3.3 Referral Service

ICES member research and operational data centres produce a variety of data analysis products and referral services. By dividing ocean areas into regions of responsibility, and by developing mutually agreed guidelines on the format, data quality and content of the products, better coverage is obtained. By having the scientific experts work in ocean areas with which they are familiar, the necessary local knowledge finds its way into the products. Data and information products are disseminated as widely as possible and via a number of media including mail, electronic mail and bulletin boards.

If the Data Centre is unable to fulfil the client's needs, it will endeavour to provide the client with the name of an organisation and/or person who may be able to assist. In particular, assistance from the network of Data Centres within the ICES Community will be sought.

REFERENCES

Karl, David, Luis Tupas, Fernando Santiago-Mandujanu, Craig Nosse, Dale Hebel, Eric Firing and Roger Lukas. 1996. Hawaii Ocean Time-Series Data Report 7:1995, SOEST 96-09, University of Hawaii.

Pollard, R, 1986, Frontal surveys with a towed profiling conductivity /temperature/depth measurement package (SeaSoar)*Nature* 323, 433 - 435 (02 October 1986)

UNESCO. 1988. The acquisition, calibration and analysis of CTD data. A report of SCOR WG 51. Tech. Pap. Mar Sci., 54: 59pp.

UNESCO, 1991. Processing of Oceanographic Station Data, JPOTS Editorial Panel.