

OCEANOGRAPHIC DATA PROCESSING AT INDIAN NATIONAL OCEANOGRAPHIC DATA CENTRE

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INODC acquires and accessions appropriate data and information that describe the physical, chemical and biological characteristics of the Bay of Bengal, the Arabian sea and other regions of Indian ocean. Data contributors are, primarily, the National Institute of Oceanography, Naval Physical and Oceanographic Laboratory, Central Marine Fisheries Research Institute and other oceanographic data generating agencies.

INODC prefers to receive data in fully processed form on magnetic tapes. Data may be received in raw form, on printed data reports, other hard copy forms or on analog form. These data must be converted to digital form before they can be processed. The types of data, being handled at present at INODC are i) Station data, ii) Underway data and iii) Time series data. The procedures adopted at INODC to process these data are presented here. The statistical methods to process the data are also briefed.

The processing procedures of oceanographic data at INODC are, mainly, acquisition, preparation, quality control and data completion.

Acquisition :

The data, by accompanying documentation, submitted to INODC is reviewed to ensure that it is accurately described to characterise the data type and to determine if it is suitable for processing. Conversion into INODC formats is required if the data is raw form. The data sets are assigned INODC reference numbers that are recorded in inventory data base.

Preparation :

The data received in processed form on magnetic tapes or floppy discs, working copies are made before appending them to the respective data bases. Data in raw form, in report or publication form which are processable are coded, keypunched and put on magnetic tape. Analog charts are screened for obvious errors or omissions and then digitized before processing is done. Processing is done through the computer programs upon completion of data preparation.

Quality control :

No absolute check on data accuracy can be provided by the data processing personnel, other than detecting coding errors and suspect data. Data originators are responsible for scientific validity of the data. Quality control programs check for completion of mandatory fields, expected ranges for data fields and similar items. If the data can not be corrected, they are omitted from entry into the data base.

Data completion :

The data subjected to the above stages in the data processing procedures, is merged with the data of same type. All error listings and other related materials are filed separately. The merged data sets into the the INODC data bases are available for dissemination to users.

Interpolation :

Three point Lagrange interpolation equation is used to interpolate temperature, salinity, and oxygen at standard depths. The standard depths (in meters) for which INODC interpolates are :

0000	0125	0600	1300	4000
0010	0150	0700	1400	5000
0020	0200	0800	1500	6000
0030	0250	0900	1750	7000
0050	0300	1000	2000	8000
0075	0400	1100	2500	9000
0100	0500	1200	3000	

The observed values used to interpolate a value at a given standard depth are normally chosen as one above the required depth and two below. If there are standard depths between the last two observed depths for a station, then the values are chosen as two above and one below for the required standard depths.

Computation of Density(Sigma-t) :

Sigma-t is computed whenever both temperature (t) and salinity (s) are present. Doubtful indicators associated with depth, temperature and salinity are ignored.

Sound velocity :

Sound velocity is computed according to Wilson's formula whenever both valid temperature and salinity are present and the depth is not doubtful.

Various formulae are used to compute Dynamic depth anomaly at standard depths, Specific volume anomaly Pressure determination, Potential temperature and Density which are not described here.

Software needed for the processing of the data, statistical treatment, retrieval of the data as for users' requests are developed at INODC. These programs are written in FORTRAN 77 and in BASIC. Retrieval software in DBASE III plus is also developed to meet the requirements of the end users.