

## 4.2. CO-IF0013 : multi-profile Coriolis NetCdf format

Interface name	multi-profile Coriolis NetCdf format
Reference	CO-IF0013
Source	Function «NetCdf dissemination» CO-FO-05-05
Destination	Function «web & ftp dissemination» CO-FO-05-01
Operating mode	-
Frequence	-
Estimated volume	-
Last update	31/08/2000

### Dimensions definitions

```

N_CODE = 4 ;
N_DATE_TIME = 19 ;

// Null terminated string
N_STRING64 = 64 ;
N_STRING16 = 16 ;
N_STRING4 = 4 ;

// These dimensions depend on data set
N_PARAM = 4 ;
mN_PROF = 80 ;
mN_ZLEV = 547 ;

```

## Metadata

Metadata are coded as global attributes

```
// global attributes (given with their fillValue)
// Date and comments on updates of this file (char*80)
:Last_update = "";
// File version (referencing the version of the format)
:Version = "V1.0";
// Data provider
:Data_provider = "IFREMER/CORIOLIS";
// References of experiment (char*80)
:Experiment_name = "";
:Project_name = "";
// Description of experiment (char*256)
:Experiment_description = "";
// Description of the geographical area (char*80)
:Geographical_area = "";
// Dates (convention : DD/MM/YYYY HH24:MI:SS)
// 01/01/1950 00:00 recommended
:Reference_date_time = "";
:Start_date = "";
:Stop_date = "";
// Limits of the experiment (decimal degrees ,positive =North,East)
:South_latitude = -999. ; // [-90,90] for latitudes
:North_latitude = -999. ;
:West_longitude = -999. ; // ]-180,180] for longitudes
:East_longitude = -999. ;
// Coordinate system (GMT convention)
:Coord_system = "GEOGRAPHICAL";
// GF3 code of the immersion reference parameter for the file (DEPH, PRES,
TIME)
:Reference_parameter = "";
// Data interpolated on fixed levels of reference parameter ("YES" or "NO")
:Normalized_data = "";
// Data type = list of Roscop codes for the file (char*80)
:Data_type = "";
// Description of file constitution : data, user request... (char*1024)
:File_contents = "";
// Comments on file contents/modification (char*256)
:comments = "";
```

### General information on each profile

```
// General information on each profiles
char PARAMETERS(N_PARAM,N_CODE) ;
    PARAMETERS:long_name = "List of parameters" ;
    PARAMETERS:Conventions = "GF3 code of the indexed parameter among
(DEPH, PRES, PSAL, TEMP)";
    PARAMETERS:_FillValue = " " ;
char VOYAGE_NAME(mN_PROF,N_STRING16) ;
    VOYAGE_NAME:long_name = "Voyage name" ;
    VOYAGE_NAME:Conventions = "To Be Defined" ;
    VOYAGE_NAME:_FillValue = " " ;
char PLATFORM_NUMBER(mN_PROF,N_STRING16) ;
    PLATFORM_NUMBER:long_name = "Platform number" ;
    PLATFORM_NUMBER:Conventions = "To Be Defined" ;
    PLATFORM_NUMBER:_FillValue = " " ;
int STATION_NUMBER(mN_PROF) ;
    STATION_NUMBER:long_name = "Station or cycle number" ;
    STATION_NUMBER:Conventions = "To Be Defined" ;
    STATION_NUMBER:_FillValue = 99999 ;
char DIRECTION(mN_PROF) ;
    DIRECTION:long_name = "Direction of the station : A, D" ;
    DIRECTION:Conventions = "To Be Defined" ;
    DIRECTION:_FillValue = " " ;
char REFERENCE(mN_PROF,N_STRING16) ;
    REFERENCE:long_name = "Reference for each profile in Coriolis data base" ;
    REFERENCE:Conventions = "To Be Defined" ;
    REFERENCE:_FillValue = " " ;
char INST_TYPE(mN_PROF,N_STRING4) ;
    INST_TYPE:long_name = "Instrument type for profile" ;
    INST_TYPE:Conventions = "OMM probe code" ;
    INST_TYPE:_FillValue = " " ;
char REC_TYPE(mN_PROF,N_STRING4) ;
    REC_TYPE:long_name = "Recorder type for profiles" ;
    REC_TYPE:Conventions = "OMM recorder code" ;
    REC_TYPE:_FillValue = " " ;
char DATE(mN_PROF,N_DATE_TIME) ;
    DATE:long_name = "Dates of each profile" ;
    DATE:Conventions = "DD/MM/YYYY HH24:MI:SS" ;
    DATE:_FillValue = " " ;
float BOTTOM_DEPTH(mN_PROF) ;
    BOTTOM_DEPTH:long_name = "Bottom depth of each profile" ;
    BOTTOM_DEPTH:unit= "meters" ;
    BOTTOM_DEPTH:Conventions = "not mandatory, always positive" ;
    BOTTOM_DEPTH:_FillValue = -99999.f ;
    BOTTOM_DEPTH:valid_min = 0 ;
    BOTTOM_DEPTH:valid_max = 15000 ;
double JULD(mN_PROF) ;
    JULD:long_name = "Julian day of each profile relative to REFERENCE_DATE" ;
    JULD:units = "julian days" ;
    JULD:Conventions = "Relative julian days" ;
    JULD:_FillValue = -99999. ;
double LATITUDE(mN_PROF) ;
    LATITUDE:long_name = "Latitude of each profile" ;
    LATITUDE:units = "degrees_north" ;
    LATITUDE:_FillValue = -99999.f ;
    LATITUDE:valid_min = -90.f ;
    LATITUDE:valid_max = 90.f ;
double LONGITUDE(mN_PROF) ;
    LONGITUDE:long_name = "Longitude of each profile" ;
    LONGITUDE:units = "degrees_east" ;
    LONGITUDE:_FillValue = -99999.f ;
```

```

LONGITUDE:valid_min = -180.f ;
LONGITUDE:valid_max = 180.f ;
char Q_DATE(mN_PROF) ;
    GCQF:long_name = "Quality on Date and Time" ;
    GCQF:Conventions = "Q where Q =[0,9]" ;
    GCQF:_FillValue = "9" ;
char Q_POSITION(mN_PROF) ;
    GCQF:long_name = "Quality on position (latitude and longitude)" ;
    GCQF:Conventions = "Q where Q =[0,9]" ;
    GCQF:_FillValue = "9" ;
char Q_BOTTOM(mN_PROF) ;
    GCQF:long_name = "Quality on bottom depth" ;
    GCQF:Conventions = "Q where Q =[0,9], not mandatory" ;
    GCQF:_FillValue = "9" ;
char Q_DEPTH(mN_PROF) ;
    GCQF:long_name = "Quality on bottom depth" ;
    GCQF:Conventions = "Q where Q =[0,9], not mandatory" ;
    GCQF:_FillValue = "9" ;
char Q_PROFILE_PRES(mN_PROF) ;
    GCQF:long_name = "Global quality flag of pressure profile" ;
    GCQF:Conventions = "Q where Q =[0,9]" ;
    GCQF:_FillValue = "9" ;
char Q_PROFILE_DEPH(mN_PROF) ;
    GCQF:long_name = "Global quality flag of depth profile" ;
    GCQF:Conventions = "Q where Q =[0,9]" ;
    GCQF:_FillValue = "9" ;
char Q_PROFILE_TEMP(mN_PROF) ;
    GCQF:long_name = "Global quality flag of temperature profile" ;
    GCQF:Conventions = "Q where Q =[0,9]" ;
    GCQF:_FillValue = "9" ;
char Q_PROFILE_PSal(mN_PROF) ;
    GCQF:long_name = "Global quality flag of practical salinity profile" ;
    GCQF:Conventions = "Q where Q =[0,9]" ;
    GCQF:_FillValue = "9" ;

```

**Data**

```

// Data for profiles
// Variable naming conventions:
// Measured value : GF3 code (mandatory if measured and mentioned in PARAMETERS),
// Associated QC flag : "QC_" + GF3 (mandatory if measured and mentioned in
PARAMETERS),
// Error estimation : "Error_" + GF3 (not mandatory)
float PRES(mN_ZLEV, mN_PROF) ;
    PRES:long_name = "Pressure" ;
    PRES:_FillValue = 99999.f ;
    PRES:units = "decibar = 1000 Pa" ;
    PRES:valid_min = 0. ;
    PRES:valid_max = 15000. ;
char QC_PRES(mN_ZLEV, mN_PROF) ;
    Q_PRES:long_name = "Global quality on pressure" ;
    Q_PRES:Conventions = "Q where Q =[0,9]" ;
    Q_PRES:_FillValue = "9" ;
float Error_PRES(mN_ZLEV, mN_PROF) ;
    Error_PRES:long_name = "Error on Pressure" ;
    Error_PRES:_FillValue = 9999.f ;
    Error_PRES:units = "decibar = 1000 Pa" ;
    Error_PRES:valid_min = 0. ;
    Error_PRES:valid_max = 15000. ;
    Error_PRES:comment = "description of error calculation (convention TDB)";
float DEPH(mN_ZLEV, mN_PROF) ;
    DEPH:long_name = "Depth below sea surface" ;
    DEPH:_FillValue = 9999.f ;
    DEPH:units = "metres" ;
    DEPH:valid_min = 0. ;
    DEPH:valid_max = 15000. ;
char QC_DEPH(mN_ZLEV, mN_PROF) ;
    Q_DEPH:long_name = "Global quality on depth" ;
    Q_DEPH:Conventions = "Q where Q =[0,9]" ;
    Q_DEPH:_FillValue = "9" ;
float Error_DEPH(mN_ZLEV, mN_PROF) ;
    Error_DEPH:long_name = "Error on depth below sea surface" ;
    Error_DEPH:_FillValue = 9999.f ;
    Error_DEPH:units = "metres" ;
    Error_DEPH:valid_min = 0. ;
    Error_DEPH:valid_max = 15000. ;
    Error_DEPH:comment = "description of error calculation (convention TDB)";
float TEMP(mN_ZLEV, mN_PROF) ;
    TEMP:long_name = "Temperature in situ T90 scale" ;
    TEMP:_FillValue = 9999.f ;
    TEMP:units = "degres Celsius" ;
    TEMP:valid_min = -3. ;
    TEMP:valid_max = 40. ;
char QC_TEMP(mN_ZLEV, mN_PROF) ;
    Q_TEMP:long_name = "Global quality on temperature" ;
    Q_TEMP:Conventions = "Q where Q =[0,9]" ;
    Q_TEMP:_FillValue = "9" ;
float Error_TEMP(mN_ZLEV, mN_PROF) ;
    Error_TEMP:long_name = "Error Temperature (in situ)" ;
    Error_TEMP:_FillValue = 9999.f ;
    Error_TEMP:units = "degres Celsius" ;
    Error_TEMP:valid_min = 0. ;
    Error_TEMP:valid_max = 40. ;
    Error_TEMP:comment = "description of error calculation (convention TDB)";
float PSAL(mN_ZLEV, mN_PROF) ;
    PSAL:long_name = "Practical salinity, sal78" ;
    PSAL:_FillValue = 9999.f ;

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```

        PSAL:units = "P.S.U." ;
        PSAL:valid_min = 0. ;
        PSAL:valid_max = 60. ;
char QC_PSAL(mN_ZLEV, mN_PROF) ;
        Q_PSA:L:long_name = "Global quality on practical salinity" ;
        Q_PSA:L:Conventions = "Q where Q = [0,9]" ;
        Q_PSA:L:_FillValue = "9" ;
float Error_PSAL(mN_ZLEV, mN_PROF) ;
        Error_PSA:L:long_name = "Error on Practical salinity" ;
        Error_PSA:L:_FillValue = 9999.f ;
        Error_PSA:L:units = "P.S.U." ;
        Error_PSA:L:valid_min = 0. ;
        Error_PSA:L:valid_max = 60. ;
        Error_PSA:L:comment = "description of error calculation (convention TDB)";

```

Quality flags	
Value	Description
0	Unqualified
1	Correct value (All checks passed)
2	Value inconsistent with statistics (Differ from climatology)
3	Dubious value (spike, gradient, ... if other tests passed)
4	Impossible value (out of scale, vertical instability, constant profile, ...)
5	Value modified during Quality Control
6-7	Not used (available)
8	Profile interpolated at standard depth
9	Missing value

#### 4.2.1. Classification of vertical profiles

In Coriolis database, vertical profiles are classified by data types and probe codes.

##### 4.2.1.1. Data-types

Data-types are general families of profiles. There are 6 data-types for vertical profiles. Data-types are defined by the GTSP program.

- **XB**  
An XB profile is performed by an XBT probe. It is a full resolution profile.
- **CT**  
A CT profile is performed by a CTD equipment. The vertical resolution of the profile is decimated to 10 meters. It is therefore a high resolution profile, but not a full resolution profile (a full resolution profile has a vertical resolution of less than 1 meter).
- **PF**  
A PF profile is performed by a lagrangian float. It is a full resolution profile.
- **TR**  
A TR profile is performed by a thermistor chain from drifting buoys or moorings. It is a full resolution profile.
- **BA**  
A BA (bathy) profile is a low resolution profile received from the GTS network. It is a real-time profile. The measurements are performed by XBT, CTD, profilers, buoys or moorings.  
A BA profile contains only temperature measurements with a resolution of 1/10.  
When a profile with full resolution is available, the corresponding BA low resolution profile is removed from the database.
- **TE**  
A TE (tesac) profile is a low resolution profile received from the GTS network. It is a real-time profile. The measurements are performed by XBT, CTD, profiler, buoys or moorings.  
A TE profile contains temperature measurements with a resolution of 1/100. A TE message may also contain salinity measurements with a resolution of 1/100.  
When a profile with full resolution is available, the corresponding TE low resolution profile is removed from the database.

#### 4.2.1.2. Probe codes

Probe codes are defined by the WMO (World Meteorological Agency). These codes describe accurately XBT versions. But, the description of CTD, buoys or moorings is very general.