

Water sampling data

File Name

xxnnnn.WAT (e.g. : RF0123.WAT)

where, xx: Hydrographic Code [listed in Table1]
nnnn: Station number (4 digits)

Record Definition

1. Header Part

- 1st record (variable length): Ship, Cruise number, Format

```
10      20      30      40      50
|-----|-----|-----|-----|
|Ship, R/V Ryofu Maru, Cruise number, 97-01, Format, E3.1
```

- 2nd record: Station, Total casts

```
10      20      30
|-----|-----|
|Station, RF- 0335, Total casts, 1
```

- 3rd record: No.of Records

```
10
|-----|
|No.of Records, 23
```

- From 4th to (3+n)th record: CastNo, Date, Time(JST), Lat, Lon, Depth, Depth flg. (listed in Table3), Layer

```
10      20      30      40      50      60
|-----|-----|-----|-----|-----|
|CastNo,1, Date, 1997/01/24, Time (JST), 0510, Lat., 33-59.82 N,
70      80      90      100     110
|-----|-----|-----|-----|
|Lon., 137-01.24 E, Depth, 1310M, Depth Flg, 1, Layer, 23
```

- (4+n)th record (variable length): Parameters (listed in Table2)

```
10      20      30
|-----|-----|
|Parameters, 1, 2, 3, 5, 6, 9, 10, 11, 12, 13, 14
```

- From (5+n)th to (5+n+1)th record (variable length)
Format of 'Data Part'. Field type and units follow Table2.

```
10      20      30      40      50      60
|-----|-----|-----|-----|-----|
|STNNBR, CSTNO, POS, BTLSE, F, TIME, CTDPRS, CTDDEP, CTDTMP, CT
70      80      90      100     110
|-----|-----|-----|-----|
|DSAL, THETA, SIGTHT, SALNTY, F, OXYGEN, F, PHSPHT, F, NO2+NO
120     130     140     150     160     170
|-----|-----|-----|-----|
|3, F, NITRIT, F, SILCAT, F, PH, F, CHLORA, F, PPHYTN, F, RE
180
|-----|
|VPRS, REVTMP
```

```
10      20      30      40      50      60
|-----|-----|-----|-----|-----|
|, , , , JST, DBAR, METERS, ITS-90, PS
70      80      90      100     110
|-----|-----|-----|-----|
|S-78, ITS-90, KG/M3, PSS-78, , UMOL/L, , UMOL/L, , UMOL/L
120     130     140     150     160     170
|-----|-----|-----|-----|
|L, , UMOL/L, , UMOL/L, , , , UG/L, , UG/L, ,
180
|-----|
|DBAR, ITS-90
```

2. Data Part

Data of each bottle are documented in one record in order of parameter number (variable length). Flag of bottle follows Table4 and flag of each data follows Table5. However, flag of water depth(DEPTH) follows Table6.

The definitions of fields are as follows.

- STNNBR: Station number
- CSTNO: Cast number
- POS: Position of resette
- BTLSER: Serial number of bottle
- F: Flag of bottle
- TIME JST: Time of trigger (JST)
- CTDPRS: Pressure in CTD measurement
- CTDDPEP: Depth in CTD measurement
- CTDSAL: Salinity in CTD measurement
- THETA: Potential temperature
- SIGTHT: Potential density

Measured values and quality flags for parameters in (4+n)th record are documented as follows.

- CTDOXY: Dissolved oxygen(DO) by DO sensor
- SALNTY: Salinity
- F: Flag of salinity
- OXYGEN: Dissolved oxygen
- F: Flag of dissolved oxygen
- :

10	20	30	40	50	60
RF-0335,	1,	24,02-12830,	2,0551,	5.2,	5,15.4071,34.
70	80	90	100	110	
6334,	15.4063,	25.5995,	-9.0000,9,	246.9,2,	0.32,2,5.7
120	130	140	150	160	170
1,2,	0.40,2,	8.61,2,	8.093,2,	-9.00,9,	-9.00,9,
180					
-9.0,	-9.000				

Table 1: Ship codes.

Ship Name	Hydrographic	Subsurface current	BT
Kofu Maru	KH/KO	AH/AO	TH/TO
Ryofu Maru	RF	AF	TF
Keifu Maru I	KE	AE	TE
Keifu Maru II	KS	AS	TS
Shumpu Maru	SH	AH	TH
Chofu Maru	NC	AC	TC
Seifu Maru	SM	AM	TM

Table 2: Parameter Number/Mnemonic/Field Type

Parameter Number	Parameter	Mnemonic	Units		Field Type	Flag
			Scientific	Mnemonic		
	Station number	STNNBR			A8	
	Cast number	CSTNO			I3	
	Bottle position number	POS			I3	
	Bottle serial number	BTLSER			A8	*
	Sampling time	TIME		JST	I4.4	
	CTD pressure	CTDPRS	10 ⁴ Pa	DBAR	F7.1	
	CTD depth	CTDDEP	meters	METERS	I7	
	CTD temperature	CTDTMP	deg C	ITS-90	F7.4	
	CTD salinity	CTDSAL	PSS-78	PSS-78	F7.4	
	Potential temperature	THETA	deg C	ITS-90	F7.4	
	Potential density	SIGTHT	kg/m ³	KG/M3	F7.4	
0	CTD oxygen	CTDOXY	μ mol/l	UMOL/L	F7.1	
1	Salinity	SALNTY	PSS-78	PSS-78	F7.4	*
2	Dissolved oxygen	OXYGEN	μ mol/l	UMOL/L	F7.1	*
3	Phosphate	PHSPHT	μ mol/l	UMOL/L	F7.2	*
4	Nitrate	NITRAT	μ mol/l	UMOL/L	F7.2	*
5	Nitrite+Nitrate	NO2+NO3	μ mol/l	UMOL/L	F7.2	*
6	Nitrite	NITRIT	μ mol/l	UMOL/L	F7.2	*
7	Ammonium	NH4	μ mol/l	UMOL/L	F7.2	*
8	Total-P	T-P	μ mol/l	UMOL/L	F7.2	*
9	Silicate	SILCAT	μ mol/l	UMOL/L	F7.2	*
10	pH (NBS scale at 25)	PH			F7.3	*
11	Chlorophyll a	CHLORA	μ g/l	UG/L	F7.2	*
12	Phaeophytin	PPHYTN	μ g/l	UG/L	F7.2	*
13	Reversing pressure meter	REVPRS	10 ⁴ Pa	DBAR	F7.1	
14	Reversing temperature meter	REVTMP	deg C	ITS-90	F7.3	
15	Depth (estimated with wire length or Thermosteric depth)	DEPTH	meters	METERS	I7	*
16	Dissolved inorganic carbon	TCARBN	μ mol/l	UMOL/L	F7.1	*
17	Total alkalinity A_T	ALKALI	μ mol/l	UMOL/L	F7.1	*
18	Dissolved organic carbon	DOC	μ mol/l	UMOL/L	F7.2	*
19	Dissolved organic nitrogen	DON	μ mol/l	UMOL/L	F7.2	*
20	Methane	CH4	nmol/kg	NMOL/KG	F7.3	*
21	Nitrous oxide	N2O	nmol/kg	NMOL/KG	F7.2	*
22	Freon-11	CFC-11	pmol/kg	PMOL/KG	F7.3	*
23	Freon-12	CFC-12	pmol/kg	PMOL/KG	F7.3	*
24	Freon-113	CFC-113	pmol/kg	PMOL/KG	F7.3	*

Table 3: Flag definitions for bathymetric measurement

Flag value	Definition
1	Echo saunder measurement without correction.
2	Echo saunder measurement with correction. (A detailed description written in -.SUM file.)
5	Using with CTD and Altimeter data
6	Contact depth of X-BT or X-CTD probe with sea bottom.
9	Not measured.

Table 4: Quality flag definitions for sampling bottles

Flag value	Definition
1	Bottle information unavailable.
2	No problem noted.
3	Leaking.
4	Did not trip correctly.
7	Unknown problem.
8	Samples taken by bucket.
9	Samples not drawn from this bottle.

Table 5: Quality flag definitions for sampling water data

Flag value	Definition
2	Acceptable measurement.
3	Questionable measurement.
4	Bad measurement.
9	Samples not drawn for this measurement from this bottle.

Table 6: Quality flag definitions for water depth data

Flag value	Definition
1	Estimated with wire length and its angle.
2	Thermosteric depth.