

# MEDATLAS Format

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## 1. OBJECTIVES

The MEDATLAS format will be used for vertical profiles and also for time series with minor modifications (date and time instead of pressure in the first columns). This format has been designed, in conformity with the international the ICES/IOC GETADE recommendations (see references), to fulfil the following requirements :

1) To facilitate the reading of the data, (and not to optimize the data archiving on the magnetic medium, neither to speed up the data processing's).

2) To be independent of the computer.

The consequence of these two points is that an auto-descriptive ASCII format will be preferred.

3) To keep track of the history of the data including the data collection and the processing. Then each cruise must be documented.

4) To allow the processing of profile independently. Therefore the date, time and geographical co-ordinate must be reported on each profile header.

5) To be flexible and accept (almost) any number of different parameters.

6) The real numbers (floating numbers must remain in the same way as they have been transmitted, not transcoded into integer numbers). The number of decimals must implicitly indicate the accuracy of the measurements.

These requirements have been taken into account in the MEDATLAS exchange format which has been designed by the MEDATLAS and MODB consortia, in the frame of the European MAST II programme. The profiles measured with the same instrument (eg. bottles, CTD, XBT..) during the same cruise, are grouped within the same file which includes :

- -a cruise header based on the international ROSCOP information;
- -a profile (station) header including the cruise reference, the originator station reference within the cruise and the time and location .
- -the data points of the profile.

The sequence 'profile header + data records ' is repeated for each profile. The main fields are described further on.

## 2. CRUISE SUMMARY FORMAT

**BP** = Beginning Position, **SL** = string length, **NDT**= Number of data types (ROSCOP)

**NCO** = Number of comment lines (textual information on the cruise)

LINE	FIELD	DESCRIPTION	BP	SL	TYPE
1	1st character *		1	1	char
	cruise	MEDATLAS reference	2	13	char
	name	originator cruise name/ref.	16	32	char
	ship code	standardised WDCA/ICES/IOC code	49	4	char
	ship name	full ship name	54	25	char
2	start date	DD/MM/YYYY	1	10	char
	end date	DD/MM/YYYY	12	10	char
	region	GF3 table	23	35	char
3	country	Source laboratory country code	1	2	char
	address	Laboratory, institution, town	4	75	char
4	name	chief scientist full name	1	40	char
	key word	'Project='	42	8	char
	project	name of the project	50	28	char
5	key	'Regional Archiving='	1	19	char
	data centre	regional archiving centre code	21	2	char
	key word	'Availability='	42	13	char
	availability	Data Availability code (P/L/C)	55	1	char
5+1	key word	'Data Type='	1	10	char
	data type	ROSCOP code	11	3	char
TO	key word	'n='	15	2	char
	number	number of profiles for the type	17	4	num
5+NDT	key word	'QC='	22	3	char
	QC	Y/N (Yes or No)	25	1	char
6+NDT	key word	'COMMENT'	1	7	char
.....	.....	.....			
5+NDT+NCO	key word	any other cruise information	1	80	char

#### EXAMPLE

\*GN36199102701 POEM-I-91(P191) 36AE AEGAE0 (AEGAIO PRE-10/94)  
02/10/1991 13/11/1991 MED., EASTERN BASIN  
36 NCMR, ATHENS, GREECE  
THEOCHARIS A. Project=POEMBCO91  
Regional Archiving= GN Availability=P  
Data Type=H10 n= 109 QC=Y  
COMMENT  
DM=P T S DENS controlled with Levitus 83

### 3. PROFILE FORMAT

#### 3.1 PROFILE FORMAT - header

**NP** = number of observed parameters incl. the reference (pressure); **BP**  
=Beginning Position

**NCO** = number of comment lines in the header; **SL** = string length

The information behind the comment lines (end of the station, secchi disk, meteorological observations) are optional.

The first observed parameter is the reference :

- -pressure in decibar for the observations in the water
- -depth (in meters) below the bottom for sediment observations
- -date + time + seconds (optional) for Eulerian time series
- -date + time + latitude + longitude for underway data or Lagrangian time series.

Columns of observations must be separated by a blank character.

LINE	FIELD	DESCRIPTION	BP	SL	TYPE
1	start character *		1	1	char
	reference	MEDATLAS ref. (cruise+station+cast)	2	18	char
	key word	'Data Type='	21	10	char
	data type	ROSCOP code	31	3	char

2	date	'*DATE=', DDMMYYYY	1	14	char	
	time	'TIME=', HHMM	16	9	char	
	latitude N/S	'LAT=', N or S	26	5	char	
	lat. degrees	latitude degrees (0 to 90)	31	2	char	
	lat. minutes	latitude minutes.hundredth	34	5	char	
	longitude E/W	'LON=', E or W	40	5	char	
	long. degrees	longitude degrees (0 to 180)	45	3	char	
	long. minutes	minutes.hundredth	49	5	char	
	key word	'DEPTH='	55	6	char	
	bottom depth	bottom depth in metres	61	6	num	
	key word	'QC='	68	3	char	
	time flag	QC flag on date and time	71	1	num	
	lat. flag	QC flag on latitude	72	1	num	
	long. flag	QC flag on longitude	73	1	num	
	depth flag	QC flag on bottom depth	74	1	num	
3	key word	*NB PARAMETERS= '	1	15	char	
	nb. of columns	number of measured parameters (NP)	16	2	num	
	key word	'RECORD LINES='	19	13	char	
	number of lines	number of observations records (NL)	32	5	num	
4	1st character	*	1	1	char	
	title column p	GF3 code for parameter p	2	4	char	
TO	parameter p	parameter full name (IOC def.)	7	30	char	
	unit p	('IS/IOC unit')	37	30	char	
3+NP	key word	'def.='	68	5	char	
	default val.	string of '9'.string of '9'	73	nlen(np)	num	
		same format as the parameter p				
4+NP	key word	'*GLOBAL PROFILE QUALITY FLAG='	1	29	char	
	profile QC	global quality flag for the profile	30	1	num	
	key word	'GLOBAL PARAMETERS QC FLAGS='	32	27	char	
	profile QC	global quality flags for the	50	NP	num	
		NP parameters				
5+NP	collect hist.1	'*DC HISTORY='method, instrum. etc	1	80	char	
6+NP	collect hist.2	'*', continuation	1	80	char	
7+NP	archv. hist.1	'*DM HISTORY', data mangt. history	1	80	char	
8+NP	archv. hist.2	'*', end of data management	1	80	char	
9+NP	comment 1	'*COMMENT ', (optionnal) record END	1	80	char	
10+NP	date	'*DATE=', DDMMYYYY	1	14	char	
	time	'TIME=', HHMM	16	9	char	
	latitude N/S	'LAT=', N or S	26	5	char	
	lat. degrees	latitude degrees (0 to 90)	31	2	char	
	lat. minutes	latitude minutes.hundredth	34	5	char	
	longitude E/W	'LON=', E or W	40	5	char	
	long. degrees	longitude degrees (0 to 180)	45	3	char	
	long. minutes	minutes.hundredth	49	5	char	
	key word	'DEPTH='	55	6	char	
	bottom depth	bottom depth in metres	61	6	num	
	key word	'QC='	68	3	char	
	time flag	QC flag on date and time	71	1	num	
	lat. flag	QC flag on latitude	72	1	num	
	long. flag	QC flag on longitude	73	1	num	
	depth flag	QC flag on bottom depth	74	1	num	

TO comments '\*SECCHI DISK' 1 80 char  
 8+NP+NCO comment '\*', end of comments 1 80 char  
 9+NP+NCO surface obs. 1 '\*SURFACE SAMPLES=', samples 1 80 char  
  
 10+NP+NCO surface obs. 2 '\*', end of surface samples 1 80 char

### EXAMPLE

```

*GN3619910270140470 Data Type=H10
*DATE=27101991 TIME=0415 LAT=N34 30.00 LON=E022 30.00 DEPTH=2760 QC=1111
*NB PARAMETERS=03 RECORD LINES=01999
*PRES SEA PRESSURE sea surface=0 (DECIBAR=10000 PASCALS) def.= -999.9
*TEMP SEA TEMPERATURE (CELSIUS DEGREE) def.= 99.999
*PSAL PRACTICAL SALINITY (P.S.U.) def.= 99.999
*GLOBAL PROFILE QUALITY FLAG=1 GLOBAL PARAMETERS QC FLAGS=111
*DC HISTORY= SBE 9/11 CTD System, Sea-Bird.
*Sensor calibration: 09/01/1989 by Sea-Bird.
*DM HISTORY
*
*COMMENT
*Raw data interpolated every meter with Lagrange third degree polynomial
*formula. Salinity correction by Autosal Salinometer (NCMR). Temperature
*and salinity intercalibrated with Italian,Turkish,Israel POEM stations.
*SURFACE SAMPLES=
*
  
```

## 3.2 PROFILE FORMAT - data points

Each parameter  $p$  can have any length  $nlen(p)$ , but this length must be constant in the profile, and the decimal points at a constant position. The separators are blanks of one character (or more), after each parameter value. The quality flags are grouped after the last separator, with no blank between them.

The position of the first character of parameter  $p$  in the record line is then :

$$bp(p) = nlen(1) + \dots + nlen(p-1) + p$$

and the position of the first quality flag :

$$bp(q1) = bp(NP) + nlen(NP) + 1$$

$nlen(p)$  = number of digits of parameter  $p$ ;  $NP$  = number of measured parameters (columns)

$NL$  = number of observations records (lines)

**nheader** = NP+NCO +11 = total number of header lines; **NCO** = number of comment lines

**BP** =Beginning Position, **SL** = string length

LINE	FIELD	DESCRIPTION	BP	SL	TYPE
<b>nheader</b>	start character *		1	1	char
	title 1	'PRES' or ref. parameter	2	4	char
	separator	blank	6	nlen(1)-4	blank
	title 2	GF3 code parameter 2	bp(2)	4	char
	separator	blank	bp(p-1)+4	nlen(p-1)-3	
	title par. P	GF3 code parameter p	bp(p)	4	char
	title NP	GF3 code parameter NP	bp(np)	4	char

<b>nheader</b>	parameter 1	parameter 1 in IS units	1	nlen(1)	num
+1	separator	blank	bp(2)-1	1	
to	parameter 2	parameter 2 in IS units	bp(2)	nlen(2)	num
+NL	separator	blank	bp(np)-1	1	
.....					
	parameter NP	parameter NP in IS units	bp(np)	nlen(np)	num
	separator	blank	bp(q1)-1	1	
	QC Flag 1	Quality Flag parameter 1	bp(q1)	1	num
.....					
	QC Flag NP	Quality Flag parameter NP	bp(q1)+np	1	num

<b>nheader</b>	def. val. par.1	'-999.9' or string of '9'	1	nlen(1)	num
+NL+1	separator	blank	bp(2)-1	1	

(Last line	def. val. par.2	string of '9' as in header	bp(2)	nlen(2)	num
of the profile)	def. val. par.NP	string of '9' as in header	bp(NP)	nlen(NP)	num

	separator	blank	bp(q1)-1	1	
	QC Flag 1	'9' (Def. val. Quality Flag)	bp(q1)	1	num
.....					
	QC Flag NP	'9' (Def. val. Quality Flag)	bp(q1)+np	1	num

### EXAMPLE

```
*PRES TEMP PSAL
2.0 22.527 38.864 111
3.0 22.535 38.864 111
4.0 22.536 38.865 111
5.0 22.535 38.865 111
6.0 22.535 38.865 111
7.0 22.534 38.866 111
8.0 22.530 38.867 111
9.0 22.525 38.869 111
10.0 22.523 38.869 111
.....
.....
1999.0 13.701 38.705 111
2000.0 13.700 38.705 111
```

-999.9 99.999 99.999 999

## **4. DESCRIPTION OF THE MAIN FIELDS**

### **4.1 Files**

All the profiles measured with the same instrument (eg. bottles, CTD, XBT..) are grouped within the same file. The data file begins with a short cruise descriptor based on the ROSCOP information forms. The profiles are attached behind and each of them begins with a profile header giving all the necessary environmental information on the observations. Each observed parameter represents a separate column. There is no limitation to the number of parameters (columns) but the number of parameters within the same cruise must be constant. If a parameter is missing in one station, the corresponding column must be fulfilled by default values.

### **4.2 Records**

The records consist in data collected at the same level. The record (line) length is not limited for observed data but reasonable (<120) number of characters in the lines is recommended.

### **4.3 Missing data**

For missing data, the default characters are :

- in character strings : 'X' as many times as the missing string length or 'UNKNOWN'
- in numbers : 9 or -9 at the same format as the expected numbers.

### **4.4 Latitude and Longitude**

In order to avoid ambiguity, N/S and E/W will be specified for latitude and longitude instead of signs.

### **4.5 Pressure/depth vertical reference parameter**

- Pressure is the reference co-ordinate (first column) for the vertical profiles.
- When the pressure is not explicitly defined (mainly the oldest historical data sets which have the depth measurements instead), the vertical co-ordinate is supposed to be pressure in decibars (which makes no significant differences on historical data).



- The first column parameter which is the reference (the pressure for vertical profiles) must be recorded in increasing order.

#### 4.6 Temperature and Salinity and other parameters

- Temperature, salinity and any archived parameters are observed parameters. The calculated parameters like density or potential temperature are not archived.

- Other measured parameters like nutrients are archived with the GF3 parameter code as the column title. The parameter code is related to the same unit, normally the International System (IS). A different unit corresponds to a different parameter code.

#### 4.7 History and information on the data processing

In order to maintain some flexibility with the format and not to lose existing complementary information on the data processing, meteorological observations etc. not taken into account in the format, three specific fields terminate each header profile :

\*DC HISTORY for the information linked to the data collection at sea (like instrument, calibration)

\*DM HISTORY for the information linked to the data management and archiving (like the source latitude if the sign or the value has been changed)

\*COMMENT for all optional data and meta data like time and location at the end of the profile, meteorological observations. Avoid to repeat character strings already used (ex use LATEND= and not LAT=) to specify the end latitude of a station. The number of \*COMMENT lines is not limited.

### 5. IDENTIFIERS AND CODES

Codes are used in the database when the information (meta-data) is frequently exchanged. The codes may be internal to the MEDATLAS format, or international (IOC/GF3, ICES) :

[Cruise](#) and [profile](#) references

[Oceanographic data centres](#)

[Countries \(GF3\)](#)

[Oceanographic regions](#)

[Observed parameters](#)  
[ROSCOP code for data sets](#)  
[Ship \(ICES\)](#)  
[Quality flags](#)  
[Availability](#)

## 5.1 Cruise reference

total 13 characters **BP**=*Beginning Position*, **SL**= *string length*

field	description	BP	SL	type
Data Centre Code	regional data centre in charge of the data set from MEDATLAS table	1	2	char
Country Code	of the institution who performed the measurements from the GF3 table	3	2	char
year	of the beginning of the cruise (numbers in characters to avoid the blanks)	5	4	char
serial number	originator reference or given by the regional data centre	9	5	char

## 5.2 Profile Reference

5 characters

Each profile is referenced unambiguously in the following way :

cruise reference code + the original station number from the field experiment + the cast number.(total 18 characters)

field	description	BP	SL	type
cruise reference	given by the regional data centre	1	13	char
station number	given by the originator	14	4	char
cast number	from the experimentation (0 to 9)	18	1	char

### **5.3 Data Centers Codes**

FI France IFREMER/SISMER

GN Greece HNODC

IO Italy OGS

### **5.4 IOC/GF3 Country Codes**

72 Albania

AL Algeria

11 Belgium

CY Cyprus

26 Denmark

27 Egypt, Arab Republic of

35 France

96 German Democratic Rep.

06 Germany, Federal Rep.

36 Greece

47 Israel

48 Italy

52 Lebanon

53 Lybian Arab Jamaihiriya

ML Malta

MO Monaco

56 Morocco

64 Netherlands

58 Norway

68 Portugal

73 Romania

RU Russia

29 Spain

77 Sweden

78 Switzerland

80 Syrian Arab Republic

88 Tunisia

89 Turkey

32 U.S.A.

UR Ukrainian Soviet Socialist Rep

90 FSU

74 United Kingdom

31 United States of America

95 Yougoslavia

IN Intergovernmental /International

## 5.5 Oceanographic Mediterranean Regions (IOC Definition)

### NAME

MEDITERRANEAN SEA  
MED. WESTERN BASIN  
GIBRALTAR STRAIT  
ALBORAN SEA  
BALEARIC SEA  
LIGURIAN SEA  
TYRRHENIAN SEA  
MED., EASTERN BASIN  
IONIAN SEA  
ADRIATIC SEA  
AEGEAN SEA  
BLACK SEA  
SEA OF MARMARA  
SEA OF AZOV

## 5.6 Observed Parameters (Extended GF3)

To each measured parameter and each compartment :

1. sea water,
2. particulates aggregates of the sea water,
3. settling particles near the water-sediment interface
4. sediment
5. pore waters
6. biota

A GF3 like parameter code is attributed, uniquely linked with parameter name and unit. These codes are used as column titles of the MEDATLAS format. The more common (GF3) are :

PRES pressure in decibars

TEMP temperature

PSAL Practical salinity.

The extended list of the parameter code is given in MTP II-MATER Data Manual Vol. II.

## 5.7 ROSCOP Codes for type OF observations

These general codes are related to an instrument and are used in the cruise header where several types of observations can be listed. A profile is related to only one.

### ROSCOP TYPE OF OBSERVATIONS CODE

B01	Primary productivity
B02	Phytoplankton pigments (eg chloroph)
B06	Dissolved organic matter (inc DOC)
H09	Water bottle stations
H10	CTD stations
H11	Subsurface meas. underway (T,S)
H13	Bathythermograph
H16	Transparency (eg transmissometer)
H17	Optics (eg underwater light levels)
H21	Oxygen
H22	Phosphate
H23	Total - P
H24	Nitrate
H25	Nitrite
H26	Silicate
H27	Alkalinity
H28	pH
H30	Trace elements
H31	Radioactivity
H32	Isotopes
H33	Other dissolved gases
H71	Surface measurements underway (T,S)
H72	Thermistor chain
H73	Geochemical tracers (eg freons)
H74	Carbon dioxide
H75	Total - N
H76	Ammonia
H80	Hydrographic atlas data
H90	Other chemical oceanographic meas.

## 5.8 Ship Codes

Ships identified on the MTP II/MATER Cruise Planning. Other ships can be added if necessary.

France ATALANTE 35A3

EUROPE 35EU

GEORGES PETIT 35GP

KOROTNEFF 35KR

SUROIT 35LU

TETHYS II 35TE

Germany, Federal Republic of POSEIDON 06PO

Greece AEGAEO 36AE

Italy URANIA 48UR

Spain HESPERIDES 29HE

GARCIA DEL CID 29GD

ODON DE BUEN 29DB

## 5.9 Quality Flags Codification

### CODE MEANING

0 NOT CONTROLLED VALUE

1 CORRECT VALUE

2 VALUE INCONSISTENT WITH STATISTICS (Out of narrow range limits)

3 OBVIOUS VALUE (SPIKE)

4 FALSE VALUE (Out of broad range regional limits, or corresponding to a vertical instability ..)

5 VALUE MODIFIED DURING QC (only for obvious location or time errors)

6-8 Not used

9 NO OBSERVED VALUE

## 5.10 Confidentiality/Availability Codification

### CODE SIGNIFICATION

- P PUBLIC DOMAIN DATA
- L LIMITED ACCESS TO DATA (PROJECT ONLY)
- C CONFIDENTIAL DATA (SUBMITTED TO CHIEF SCIENTIST PERMISSION)