

# ANNEX 3-1-3

## TMAP Database Manual

### Data Administration

Version: 08-03-2004

data class code	data class name	subject code	prefix extension) (used in	subject name
1	chemical data	101	TBWS	TBT
		102	METS	Metals in sediment
		103	NUTW	Nutrients in water
		104	CIBM	Contam. in mussel
		105	CIFL	Contam. in flounder
		106	CIBE	Contam. in bird eggs
		107	CISE	Contam. in sediment
2	biological data	201	MZBC	Macrozoobenthos
		202	PPKT	Phytoplankton
		203	BREB	Breeding birds
		204	MIGB	Migratory birds
		205	BEAB	Beached birds
		206	SEAL	Seals
3	geographical data	301	SAMA	Salt marshes
		302	MACA	Macroalgae
		303	EELG	Eelgrass
		304	BLMB	Blue mussel beds
		305	BEDU	Beaches and dunes
		306	GEOM	Geomorphology
		307	LNDU	Land use
4	general data	401	FMCS	Fishery
		402	BTAS	Boats at sea
		403	GUIT	Guided tours
		404	AIRT	Air traffic
		405	COPM	Coastal protection
		406	FLDG	Flooding
		407	WEAC	Weather conditions
		408	HYDR	Hydrology
9	common & administrative data	910		Common data
		920	CATL	Catalogue data
		931		Meta filter information
		932	mm_searchcriterion_	Actual filter information
		933	mm_tmap_	Actual TMAP information
		934	mm_exportfile_	Actual exportfile information
		935		Meta exportfile information



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# 1 Trilateral administration

Because of the de-central concept of the TMAP data handling (data unit in each country) for some tables of the TMAP database a trilateral administration is necessary. The data of this tables is commonly used in the data units and to avoid different primary keys for the same data sets the primary keys are administrated and the tables will be stored/updated at the Common Wadden Sea Secretariat (CWSS).

## Centrally administrated tables:

- **subject** [92009] - catalogue data
- **parameter** [92011] - catalogue data
- **co\_variable** [91001] - common data
- **species** [91002] - common data
- **method** [91003] - common data
- **beab\_condition** [20504] - parameter data (Beached Birds)
- **beab\_oil** [20505] - parameter data (Beached Birds)

If one of the participating data units like to introduce a new primary key of the tables above, a proposal of the key and the data set behind it has to be sent to the CWSS. The key will be checked and added to the appropriate table. Then the updated table will be send to the all data units for updating the TMAP databases.

### Table **subject** [92009]

The table contains the name and a short description of the parameter groups, which are implemented in the database of the data units. A previous selection of a subject (synonym for parameter group) in the Java selection page is absolutely necessary for a further query in the TMAP database. As the main parameter classification in the trilateral monitoring program the name and description of the subjects (parameter groups) must be the same in each data unit.

### Table **parameter** [92011]

The table stores the name and a description of the parameter of each subject (parameter group). Because of the close relation to the subjects, the content must be identically stored in the databases of the data units.

### Table **co\_variable** [91001]

The primary key of the table co\_variable is a mnemonic code. To guarantee the same code, description, unit, domain and format of the same co-variables in the three countries, which is indispensable for data comparison after downloading, and to avoid the storage of same co-variables, but with different names, this table is identically stored in the national data units. For the co-variable codes international standards (ICES, JAMP) are used as far as possible.

Table **species** [91002]

Because the same species are stored and used in the different TMAP databases a central administration of the primary key of table 'species' is necessary. The only internal used TMAP species code has 6 digits with the following structure:

species_id code	S	F	F	F	F	F
digit	1	2	3	4	5	6

S = Species class code

F = Free specific species code (for free disposal)

For reasons of maintenance the trilateral species id for birds is constructed by the leading number 2 and with the filled up with zeros 5 digit Euring code. E.g., a bird with Euringg code 5170 will get the trilateral species id 205170.

*Species class codes*

species class code	species class name
1	mammals
2	birds
3	fish
4	zoobenthos
5	phytobenthos
6	phytoplankton
7	future use
8	future use
9	non species (sediment, etc.)

*Example: species\_id 203422 is a code for a bird species.*

Table **method** [91003]

Because the methods of most of the parameter groups are different in the countries (except for the methods of the trilateral monitoring groups like JMMB, JMBB, TSEG, etc.), it is up to the national data sites to administrate and maintain the 'meth\_id' of their national monitoring methods. To avoid the multiple use of the same primary key 'meth\_id' or the other way around to get a trilateral unique assignment of a 'meth\_id' to a certain method, a special format is proposed, that guarantees trilateral users always an unambiguous meth\_id'.

The data type of 'meth\_id' in the TMAP database is defined as integer or number(8). The used code length is 8 digits.

meth_id code	C	D	S	S	M	F	F	F
digit	1	2	3	4	5	6	7	8

C = **C**ountry code (see table country codes)

D = **D**ata class code (code table see chapt. 1.8.2)

S = **S**ubject code (code table see chapt. 1.8.2)

M = **M**ethod type code (see table method type codes)

F = **F**ree specific meth\_ id code (for free disposal)

**Table country codes**

country code	country name
1	Denmark
2	Schleswig-Holstein/Hamburg
3	Lower Saxony
4	The Netherlands
5	Germany: Federal TMAP data
6	<i>free for future use</i>
7	<i>free for future use</i>
8	<i>free for future use</i>
9	trilateral

**Table method type codes**

method type code	method type name
0	Any type, unknown, not available
1	Sampling
2	Preliminary treatment
3	Storage
4	Analysis

Examples:

The meth\_id 41023001 is a Dutch (4) method in the chemical data class (1), for subject 'metals in sediment' (02) with method type 'storage' (3) and the specific code (001).

Table **beab\_condition** [20504]

As lookup table for the condition of the beached birds this table must have the same content in each country. The table is closely related to the JAMP guidelines.

Table **beab\_oil** [20505]

As lookup table for the degree of oiliness of the beached birds this table must have the same content in each country. The table is closely related to the JAMP guidelines.

## 2 Coding

During filling in data into the TMAP databases the database management system creates automatically primary keys, which value has no meaning for the database administrator. But often it is very helpful to recognize some meaning behind the value of a primary key, just to check whether the primary, or when used as foreign key, represents an expected value. For instance, when the database administrator notices a 'species\_id' as foreign key in a table, which belongs to the parameter group 'breeding birds' and the foreign key does not start with the digit '2' (which is the species class code for birds), it is clear from the view that the key is wrong.

In the TMAP database all data classes, parameter groups, tables and attributes have been coded. Also some codes for primary keys in common tables have been constructed (see chapter 1.8.1) to create distinguishable primary keys for different countries, parameter groups, species classes, etc.

For the TMAP database extension a hierarchical coding system for the data model has been build. On top of the hierarchy is the data class, which is divided in subjects (parameter groups), which again are separated into tables and then in attributes. The code of an element on a certain level is always a concatenation of the codes of the elements above this level.

<u>level</u>	<u>code</u>
data class	data class
subject	data class+subject
table	data class+subject+table
attribute	data class+subject+table+attribute

Example: attribute 'ppkt\_result\_id' has the code **2020301**.

	<u>code concat.</u>	<u>codes</u>
biological data	2	2
phytoplankton	2+02	202
ppkt_result	2+02+03	20203
ppkt_result_id	2+02+03+01	2020301

**2** (as biological parameter) +  
**02** (as subject in the biological data class) +  
**03** (as table 'ppkt\_result' in the data model of subject 'phytoplankton') +  
**01** (as attribute in table 'ppkt\_result').

The codes of the classes, parameter groups and special codes are given below. Because of the amount of attribute and table codes these codes can be found in the documentation of the TMAP data model.

Overview on data class and subject (parameter group) codes.

data class code	data class name	subject code	prefix (used in extension)	subject name
1	chemical data	101	TBWS	TBT
		102	METS	Metals in sediment
		103	NUTW	Nutrients in water
		104	CIBM	Contam. in mussel
		105	CIFL	Contam. in flounder
		106	CIBE	Contam. in bird eggs
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		303	EELG	Eelgrass
		304	BLMB	Blue mussel beds
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		306	GEOM	Geomorphology
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		402	BTAS	Boats at sea
		403	GUIT	Guided tours
		404	AIRT	Air traffic
		405	COPM	Coastal protection
		406	FLDG	Flooding
		407	WEAC	Weather conditions
		408	HYDR	Hydrology
9	common & administrative data	910		Common data
		920	CATL	Catalogue data
		931		Meta filter information
		932	mm_searchcriterion_	Actual filter information
		933	mm_tmap_	Actual TMAP information
		934	mm_exportfile_	Actual exportfile information
		935		Meta exportfile information

### 3 Compilation of geographical data sets

The data of the geographical parameter groups will be collected and prepared for the data units by the secretariat. The working steps are the following:

1. Clear specifications of the content of shape files especially of the needed attribute, catalogue and parameter data will be sent to the data originators by the secretariat.
2. The data originators are requested to return appropriate data according to the specifications.
3. The differently projected GIS data of the originators will be transferred to the trilateral used UTM32 projection. A common legend and additional data for a trilateral map will be compiled (ArcView® project file). The meta and parameter data (only the part, which gives information on source and processing of the shape files) will be filled in tables. The map will be split up into national maps.
4. The national maps will be sent back to the originators for quality check.
5. After national quality check the secretariat will send the national maps (ArcView® shape and project files) and catalogue/parameter tables to the national data units.
6. At the units these parts of the parameter data have to be filled in which is needed for administration of the shape files stored on the FTP server.

## 4 Unit codes used for parameter

Unit codes for the parameter values

parameter_code char[20]	description char[240]	unit_code char[16]
44DDD	4,4'-dichlorodiphenyldichloroethane	ug/kg
44DDE	4,4'-dichlorodiphenyldichloroethene	ug/kg
44DDT	4,4'-dichlorodiphenyltrichloroethane	ug/kg
AcNe	acenaftene	ug/kg
Ag	silver	mg/kg
Air temperature	Daily average of air temperature	C
AMON	dissolved inorganic ammonium (NH4-N)	umol/l
Ant	anthracene	ug/kg
As	arsenic	mg/kg
Atmospheric pressure	Daily average of atmospheric pressure	Pa
BaA	benz(a)anthracene	ug/kg
BaP	benz(a)pyrene	ug/kg
BbF	benzo(b)fluoranthene	ug/kg
BeP	benzo(e)pyrene	ug/kg
BghiPe	benzo(ghi)perylene	ug/kg
Biomass	biomass	kg
BkF	benzo(k)fluoranthene	ug/kg
Blue mussel fishery	Fishery of blue mussels	t
cCHLORDA	cis chlordane	ug/kg
Cd	cadmium	mg/kg
Cell number	cell number	nd
Chr	chrysene	ug/kg
cNONACHL	cis nonachlor	ug/kg
Co	cobalt	mg/kg
Cockle fishery	Fishery of cockles	t
construction	Construction of brushwood groynes, ditches, drainage channels, etc.	na
Count	Count of specimen per area or volume	1/count_site
Count	Count of specimen per area or volume	1/m2
Count	Count of specimen per area or volume	1/l
Count	Count of specimen per area or volume	1/area
CPHL	Chlorophyll-a	ug/kg
CPHLC	Chlorophyll-a (SCOR/UNESCO method)	ug/kg
CPHLL	Chlorophyll-a (Lorenz method)	ug/kg
Cr	chromium	mg/kg
Cu	copper	mg/kg
DBahAnt	dibenzo(ah)anthracene	ug/kg
DBTIN	Bibutyltin (DBT)	
defense work	Coastal stretch of salt marshes.	na
DIELD	dieldrin	ug/kg
extension	Spatial enlargement of an already existing coastal protection measure.	na
extraction	Extraction of mainly sods.	na
Fe	iron	mg/kg
Fen	fenantrene	ug/kg
Fle	fluorene	ug/kg
Flu	fluoranthene	ug/kg
HCB	hexachlorobenzene	ug/kg
HCHA	alpha hexachlorocyclohexane	ug/kg
HCHB	beta hexachlorocyclohexane	ug/kg
HCHG	gamma hexachlorocyclohexane	ug/kg
Hepo	heptachloroepoxide	ug/kg
Heptachl	heptachlor	ug/kg
Hg	mercury	mg/kg
Ice coverage	Days of year with defined ice coverage	d
InP	indeno(1,2,3-cd)pyrene	ug/kg
maintenance	Support of an already existing coastal protection measure.	na
Max. air temperature	Maximal daily air temperature	C
MBTIN	Monobutyltin	
Min. air temperature	Minimal daily air temperature	C
Mn	manganese	mg/kg
NAO index	North Atlantic Oscillation index	na
Ni	nickel	mg/kg

parameter_code char[20]	description char[240]	unit_code char[16]
nourishment	The activity of artificially replenishing the sandy coast.	na
NTOT	nitrogen total	umol/l
NTRA	dissolved inorganic nitrate (NO3-N)	umol/l
NTRI	dissolved inorganic nitrite (NO2-N)	umol/l
opDDD	ortho,para dichlordiphenyldichlorethane	ug/kg
opDDE	ortho,para dichlordiphenyldichlorethene	ug/kg
opDDT	ortho,para dichlortriphenyldichlorethane	ug/kg
other	Other activities for coastal protection measures.	na
Pb	lead	mg/kg
PCB101	2,2',4,5,5'-pentachlorobiphenyl	ug/kg
PCB105	2,3,3',4,4'-pentachlorobiphenyl	ug/kg
PCB107	2,3,3',4',5-pentachlorobiphenyl	ug/kg
PCB110	2,3,3',4',6-pentachlorobiphenyl	ug/kg
PCB114	2,3,4,4',5-pentachlorobiphenyl	ug/kg
PCB118	2,3',4,4',5-pentachlorobiphenyl	ug/kg
PCB123	2,3',4,4',5'-pentachlorobiphenyl	ug/kg
PCB126	3,3',4,4',5-pentachlorobiphenyl	ug/kg
PCB128	2,2',3,3',4,4'-hexachlorobiphenyl	ug/kg
PCB129	2,2',3,3',4,5-hexachlorobiphenyl	ug/kg
PCB130	2,2',3,3',4,5'-hexachlorobiphenyl	ug/kg
PCB132	2,2',3,3',4,6'-Hexachlorobiphenyl	ug/kg
PCB137	2,2',3,4,4',5-hexachlorobiphenyl	ug/kg
PCB138	2,2',3,4,4',5-hexachlorobiphenyl	ug/kg
PCB141	2,2',3,4,5,5'-hexachlorobiphenyl	ug/kg
PCB149	2,2',3,4',5',6-hexachlorobiphenyl	ug/kg
PCB151	2,2',3,5,5',6-hexachlorobiphenyl	ug/kg
PCB153	2,2',4,4',5,5'-hexachlorobiphenyl	ug/kg
PCB155	2,2',4,4',6,6'-hexachlorobiphenyl	ug/kg
PCB156	2,3,3',4,4',5-hexachlorobiphenyl	ug/kg
PCB157	2,3,3',4,4',5'-hexachlorobiphenyl	ug/kg
PCB158	2,3,3',4,4',6-hexachlorobiphenyl	ug/kg
PCB160	2,3,3',4,5,6-hexachlorobiphenyl	ug/kg
PCB166	2,3,4,4',5,6-hexachlorobiphenyl	ug/kg
PCB167	2,3',4,4',5,5'-hexachlorobiphenyl	ug/kg
PCB169	3,3',4,4',5,5'-hexachlorobiphenyl	ug/kg
PCB170	2,2',3,3',4,4',5-heptachlorobiphenyl	ug/kg
PCB171	2,2',3,3',4,4',6-heptachlorobiphenyl	ug/kg
PCB172	2,2',3,3',4,5,5'-heptachlorobiphenyl	ug/kg
PCB174	2,2',3,3',4,5,6'-heptachlorobiphenyl	ug/kg
PCB175	2,2',3,3',4,5',6-heptachlorobiphenyl	ug/kg
PCB177	2,2',3,3',4,5',6'-heptachlorobiphenyl	ug/kg
PCB178	2,2',3,3',5,5',6-heptachlorobiphenyl	ug/kg
PCB180	2,2',3,4,4',5,5'-heptachlorobiphenyl	ug/kg
PCB183	2,2',3,4,4',5',6-heptachlorobiphenyl	ug/kg
PCB185	2,2',3,4,5,5',6-heptachlorobiphenyl	ug/kg
PCB187	2,2',3,4',5,5',6-heptachlorobiphenyl	ug/kg
PCB189	2,3,3',4,4',5,5'-heptachlorobiphenyl	ug/kg
PCB190	2,3,3',4,4',5,6-heptachlorobiphenyl	ug/kg
PCB194	2,2',3,3',4,4',5,5'-octachlorobiphenyl	ug/kg
PCB195	2,2',3,3',4,4',5,6-octachlorobiphenyl	ug/kg
PCB196	2,2',3,3',4,4',5,6'-octachlorobiphenyl	ug/kg
PCB199	2,2',3,3',4,5,5',6'-octachlorobiphenyl	ug/kg
PCB201	2,2',3,3',4',5,5',6-octachlorobiphenyl	ug/kg
PCB202	2,2',3,3',5,5',6'-octachlorobiphenyl	ug/kg
PCB206	2,2',3,3',4,4',5,5',6-nonachlorobiphenyl	ug/kg
PCB28	2,4,4'-trichlorobiphenyl	ug/kg
PCB31	2,4',5-trichlorobiphenyl	ug/kg
PCB47	2,2',4,4'-tetrachlorobiphenyl	ug/kg
PCB49	2,2',4,5'-tetrachlorobiphenyl	ug/kg
PCB52	2,2',5,5'-tetrachlorobiphenyl	ug/kg
PCB56	2,3,3',4'-tetrachlorobiphenyl	ug/kg
PCB64	2,3,4',6-tetrachlorobiphenyl	ug/kg
PCB66	2,3',4,4'-tetrachlorobiphenyl	ug/kg
PCB70	2,3',4',5-tetrachlorobiphenyl	ug/kg

parameter_code char[20]	description char[240]	unit_code char[16]
PCB72	2,3',5,5'-tetrachlorobiphenyl	ug/kg
PCB74	2,4,4',5-tetrachlorobiphenyl	ug/kg
PCB77	3,3',4,4'-tetrachlorobiphenyl	ug/kg
PCB83	2,2',3,3',5-pentachlorobiphenyl	ug/kg
PCB85	2,2',3,4,4'-pentachlorobiphenyl	ug/kg
PCB87	2,2',3,4,5'-pentachlorobiphenyl	ug/kg
PCB92	2,2',3,5,5'-pentachlorobiphenyl	ug/kg
PCB95	2,2',3,5',6-pentachlorobiphenyl	ug/kg
PCB97	2,2',3',4,5-pentachlorobiphenyl	ug/kg
PCB99	2,2',4,4',5-pentachlorobiphenyl	ug/kg
PCTA	pentachlorothioanisole	ug/kg
PHATL	Phaeophytin-a (Lorenz method)	ug/kg
PHOS	dissolved inorganic phosphate (Ortho-PO4)	umol/l
ppDDD	para,para dichlordiphenyldichlorethane	ug/kg
ppDDE	para,para dichlordiphenyldichlorethane	ug/kg
ppDDT	para,para dichlordiphenyltrichlorethane	ug/kg
Precipitation	Daily average of precipitation	mm
PTOT	phosphate total	umol/l
Pyr	pyrene	ug/kg
QCB	pentachlorobenzene	ug/kg
restoration	Restoration of brushwood groynes, ditches, drainage channels, etc.	na
s_DDTDEDDDD	sum of 2,4DDT, 4,4DDT, 2,4DDE, 4,4DDE, 2,4DDD and 4,4DDD	ug/kg
s_PCB6695	sum PCB66 and PCB95	ug/kg
Se	selene	mg/kg
Shrimp fishery	Fishery of shrimps	t
SLCA	dissolved silicate (SiO4-Si)	umol/l
Sn	tin	mg/kg
Solar radiation	Daily average of solar radiation	W/sqm
TBTIN	Tributyltin (TBT)	
tCHLORDA	trans chlordane	ug/kg
tNONACHL	trans nonachlor	ug/kg
Water temperature	Daily average of water temperature	C
Wind direction	Daily average of wind direction	
Wind speed	Daily average of wind speed	m/sec
Zn	zinc	mg/kg

## 5 Unit codes used for co-variables

co_variable_code char[16]	description char[240]	unit_code char[16]
AGMAX	Age of the oldest specimen in the pool	year
AGMEA	Mean age of the specimens in the pool	year
AGMIN	Minimum age of the specimens in the pool	year
Al	Normalizer aluminum	mg/kg
BEGBR	Breadth of the bird egg	mm
BEGLN	Length of the bird egg	mm
BEGWT	Weight of the intact bird egg including the shell	g
BESTH	Thickness of the bird egg shell	mm
BESWT	Weight of the bird egg shell	g
BLMAX	Maximum length of the bill of the pooled birds	mm
BLMEA	Mean length of the bill of the pooled birds	mm
BLMIN	Minimum length of the bill of the pooled birds	mm
BLSTD	Standard deviation length of the bill of the pooled birds	mm
BLUTH	Thickness of the blubber	cm
CACO3	Calcium carbonate fraction in sediment	%
CONEG	Condition of egg, based on a visual estimate [0 = normal, 1 = addled egg, 2 = unusual]	na
DALAY	Day of egg laying [0 = unknown, 1 = egg laid during last 6 days, 2 = known]	na
DEPH	Sample or measurement depth	m
DIEMB	Diameter of embryo eye	mm
DOC	Dissolved organic carbon	mg/l
DOXY	Dissolved oxygen	mg/l
DRYWT	Percentage of the dry content of the material analysed	%
EXLIP	Percentage of the extractable lipid content of the material analysed	%
FATWT	Percentage of the fat content of the material analysed	%
FLDWT	Percentage of the dry matter content of the fish liver	%
FMDWT	Percentage of the dry matter content of the fish muscle	%
FSHAG	Age of the fish	year
FSHLN	Length of the fish	cm
FSHWT	Weight of the fish	g
GONWT	Total weight (indv.) or mean weight (pooled) of the gonads	g
Li	Normalizer lithium	mg/kg
LNMAX	Maximum length of the longest specimen in the pool	mm
LNMEA	Mean length of the pooled specimens	mm
LNMIN	Minimum length of the pooled specimens	mm
LNSTD	Standard deviation length of the pooled bird specimens	mm
NOEGS	Clutch size (number of eggs)	nd
NOINP	Number pooled	nd
NOINS	Number of specimens in sample (total)	na
Ph	Hydrogen ion concentration (pH)	nd
POC	Particulate organic carbon	mg/l
PSAL	Salinity (in Practical Salinity Units, PSU)	nd
SECCI	Secchi depth	m
SEXCO	Sex of the fish, bird or mammal [0 = unknown, 1 = female, 2 = male, 3 = female and male]	na
SHLWT	Mean shell weight of molluscs in a pool	g
SUSP	Suspended matter (suspended solids)	mg/l
TAMAX	Maximum length of the tail of the pooled birds	mm
TAMEA	Mean length of the tail of the pooled birds	mm
TAMIN	Minimum length of the tail of the pooled birds	mm
TASTD	Standard deviation length of the tail of the pooled birds	mm
TEMP	Temperature (in degrees Celsius)	C
TISWT	Total (indv.) / mean weight of the tissue(s) or organ(s)	g
TOC	Total organic carbon fraction in sediment (%OC)	%
WLMAX	Maximum length of the wing of the pooled birds	mm
WLMEA	Mean length of the wing of the pooled birds	mm
WLMIN	Minimum length of the wing of the pooled birds	mm
WLSTD	Standard deviation length of the wing of the pooled birds	mm
WTMAX	Maximum weight of the pooled specimens	g
WTMEA	Mean weight of the pooled specimens	g
WTMIN	Minimum weight of the pooled specimens	g
WTSTD	Standard deviation weight of the pooled specimens	g