



ANNEX 1

Instructions guide to fill the Catalogue of model-derived indicators

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Dissemination level

**Restricted to other programme participants
(including the Commission Services)**

LEAD CONTRACTOR

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1. Scope

The purpose of this survey is to catalogue available **biological diversity** (D1), **non-indigenous species** (D2), **food-web** (D4), and **seafloor integrity** (D6) descriptors' indicators of the Marine Strategy Framework Directive (MSFD), as outlined in the MSFD COM Dec 2010/477/EU¹.

Before starting your input to the catalogue we strongly advise you to read the EU Commission Decision of 1 September 2010 on criteria and methodological standards on good environmental status of marine waters (2010/477/EU).

Considering the scope of this catalogue, please include in the tables only indicators, indices, parameters or metrics (*hereafter referred to as **indicators***) suitable to fulfill the assessment criteria of D1, D2, D4, or D6. Note that some of those *indicators* might be suitable or related to more than one of the indicators outlined under these 4 descriptors and also to other MSFD descriptors, namely, D3, D5, D7-D11. If this would be the case, then complete the table in accordance, filling all adequate fields.

This WP4 catalogue is focusing on indicators that are model-derived. Use the third spreadsheet "**WP4 - Catalogue of Model-derived Indicators**" to add your indicators. If the indicators you are dealing with are not derived from models, then use instead the "**WP3 Catalogue of Indicators**" to add your contributions.

2. Instructions to fill the table

WHAT CAN YOU FIND HERE In this supporting document you will find general guidelines (section 2.1) and topic specific guidelines (section 2.2) to help you fill in the catalogue; please read them before entering any data in the table.

The catalogue excel table is structured with several fields, grouped into eight main categories:

1. indicator properties and other related information (*grey columns*);
2. indicator relation to MSFD GES Descriptors (D) (*light blue columns*);
3. indicator correspondence with Assessment Criteria and Indicators for D1/D2/D4/D6 (EU COM Dec 2010) (*light yellow columns*);
4. indicator correspondence with biodiversity components (*light green columns*);
5. indicator coverage of specific habitat types (*orange columns*);
6. indicator relation with specific pressures (*purple columns*);
7. indicator geographical range/scale of coverage (*green columns*);
8. indicator relation to existent monitoring programs (*yellow columns*).

ATTENTION

Do **NOT FORGET** to *indicate* details of the *Institution and e-mail contact of the person filling in the table (row 2)*, so that we can easily track the origin of the data and contact you for any queries we may have on the information you provided.

Do **NOT CHANGE** the structure of the catalogue by adding extra columns to the table. For any comments/suggestions you might have, please use the space given in the Excel file *read me spreadsheet* or the Observations *column CT* at the end of the table (for specific comments related to each *indicator*).

Do **NOT CHANGE** the data for the entries already in the catalogue. If you have any comments use the appropriate spaces indicated above.

Contact for doubts on filling table: heliana.teixeira@jrc.ec.europa.eu

2.1. General guidelines

Fill the catalogue (*D4.1 Annex2_DEVOTES catalogue.xls*) following the instructions given therein under each field in *italic green/blue* (e.g. in Figure 1) and respecting the guidelines outlined in the bullet points below.

Table for Catalogue Model-derived indicators (DEVOTES WP4) - List of available model derived indicators for GES assessment of Descriptors 1, 2, 4 and 6 of the MSFD						
Please, indicate Institution and e-mail contact of person filling in table:						
ID	Code	Model derived indicator	Model name	Type of the model	Type of data	Data requirement
(enter your initials, institution and name, as e.g.: Joint Research Centre - Heliana Teixeira JRC-HT)	(enter a consecutive integer # for each new Indicator of column C)	(open field - name of parameter/metric/method used)	(open field - name of model)	(open field)	(1) Static; (2) Dynamic; (3) Spatial-dynamic (select one option from dropdown list)	(open field - insert requirements for ru
AZTI_IBON	171	Species distribution	ENFA (Ecological Niche Factor Anal	Niche	1 Static	Species presence
AZTI_IBON	171	Species distribution	GAM (Generalized Additive Model	Niche	1 Static	Species presence, de
AZTI_IBON	171	Species distribution	GLM (Generalized Linear Models)	Niche	1 Static	Species presence, de
AZTI_IBON	171	Species distribution	MaxEnt (Maximum Entropy)	Niche	1 Static	Species presence
AZTI-EA	16	Fish population biomass	Ecopath with Ecosim	Food web	3 Spatial-dynamic	Biomass, Production/
AZTI-EA	18	Community trophic indices	Ecopath with Ecosim	Food web	2 Dynamic	Biomass, Production/
AZTI-EA	64	Loss in secondary production resulting from	Ecopath with Ecosim	Food web	1 Static	Biomass, Production/
AZTI-EA	121	community	Ecopath with Ecosim	Food web	3 Spatial-dynamic	Biomass, Production/
AZTI-EA	122	community	Ecopath with Ecosim	Food web	3 Spatial-dynamic	Biomass, Production/
AZTI-EA	123	Trophic level of landings	Ecopath with Ecosim	Food web	2 Dynamic	Biomass, Production/
AZTI-EA	124	Proportion of predatory fish	Ecopath with Ecosim	Food web	3 Spatial-dynamic	Biomass, Production/
AZTI-EA	125	Food web complexity	Ecopath with Ecosim	Food web	3 Spatial-dynamic	Biomass, Production/

Figure 1. Excerpt of the Excel table for the CATALOGUE OF Model-derived INDICATORS of DEVOTES WP4: columns A to G show details of fields regarding indicator properties and other related information.

The catalogue table (*D4.1 Annex2_DEVOTES catalogue.xls*) already has several *indicators* entries, (636 rows belonging to 201 indicators). These may help you fill your own data in. They refer to the *first survey* undertaken within the project. To add new indicators insert your contributions below the ones already present, and *continue the numbering* from the last Code number (*column B*) entered in the table (currently 201).

TYPE OF FIELDS IN THE TABLE:

A. *open fields* to fill freely (e.g. Figure 1 *column D*) (see examples already included in the table); and

B. *closed fields* in which you select features that apply to the indicator and/or model from which it was derived. In this case, there are three main methods to select an option, depending on the fields:

B.1. if only one option is available, enter "1" if it qualifies; leave *blank* if it does not (e.g. *columns R* to *AB*, or *AC* in the excel table);

B.2. in case there are several options available within a field, *select the one* (numbers in brackets) *that applies from the drop-down list* (e.g. Figure 1 *column F*);

B.3. in case there are several options available within a field (numbers in brackets) and more than one option applies, there are two alternatives:

1. *add a new entry (row)* in the table for that indicator, selecting the corresponding option *from the drop-down list*, and adding as many entries in the table as options you would need to report for that indicator,

- e.g., Geographical information/Marine sub-region (*column CQ* in the Excel table), if the indicator is used in more than one area;

2. or *select multiple options in a same entry within a single cell*, where more than one option should be indicated simultaneously. This alternative only applies for ***Biodiversity components*** fields,

- e.g., Biodiversity components/Fish (*column BM* in the Excel table), if a indicator refers to a ratio on Pelagic fish/Demersal fish,
- follow instructions under *columns BM* to *BQ*, on how to select more than one option in a cell and consult *section 2.2* of this guide for further details;

C. fields with specific *support information* to help fill in the table, these are *marked with an (*)* and are:

1. *column H* Status of indicator (e.g. Figure 1) – for the options available check concept definitions presented in spreadsheet "Definitions";

2. *column BR* Habitat types/Seabed - for some of the options available check concept definitions presented in spreadsheet "Definitions";

3. **column CR** Geographical information/Marine sub-divisions or ecological assessments areas – supporting maps are provided to help select among options available (consult spreadsheets per regional sea: “Baltic subdivisions MAP”; “Medit subdivisions MAP”; “NEA subdivisions MAP”);
4. **column CT** Geographical information/Non-EU SEAS - supporting map provided to help select among options available (consult spreadsheet “FAO major areas MAP”).

2.2. Guidelines by topic

1. INDICATOR PROPERTIES:

- a. **Code (column B)** – in case you need to add a new entry in the table for the same indicator (e.g. to account for a different geographical region, or habitat, or different target values, etc...), **keep the same number (#) for the indicator in every entry**. The **Code**, **Model derived indicator** name and **Source/authorship** fields (**columns B, C** and **M to Q**) will allow unique indicator recognition;
- b. **Model derived indicator (column C)** – in case you need to add a new entry in the table for the same indicator (e.g. to account for a different geographical region, or habitat, or different target values, etc...), **keep the same name for the indicator in every entry**. The **Code**, **Indicator** and **Source/authorship** fields (**columns B, C** and **M to Q**) will allow unique indicator recognition;
- c. **Model name (column D)** – label used to identify a particular model;
- d. **Type of the model (column E)** – indicate here model characteristics regarding what aspects it targets (niche, food web models, etc..) and/or the technique used to assess specific ecosystem (e.g., remote sensing);
- e. **Status of the indicator (column H)** – check *Definitions* spreadsheet for details on the available options; if an indicator has distinct status under different situations **add each situation as a new entry (row)** in the table. E.g., if an indicator is “operational” under WFD, but it would need further adjustments to work with MSFD “under development”. Be aware of respecting previous 1.a. **Code** guidelines;
- f. **Target or reference value for qualitative/quantitative indicators (columns I-J)**: if more than one target or reference value is associated with one indicator (e.g. depending on the habitat or geographical region it is applied), **add each combination as a new entry (row)** in the table, but keeping the same **Code (column B)**;

- g. **Source/authorship fields** (*columns M to Q*): if you add several entries in the table for a same indicator (with common **Code** and **Model derived indicator name** in *columns B and C*), please also **keep the same reference for the indicator in every entry**. You can give information on updates on the indicator's version that the entry refers to, by using *columns P and Q* to add new references;
- h. **Source/authorship update fields** (*columns P and Q*): use these fields to allow citing subsequent sources, in case of revised/re-defined indicators.

NOTE: An **indicator is considered the same** when it conveys the same information; therefore it should be included in the table assigning it a **common Code, Indicator name** (*columns B & C*), **independently of the number of entries** considered (for variations regarding target values, habitat, geographical region, monitoring program associated). It is also possible that they have different **Source/authorship fields** (*columns M to Q*), if they are derived from different models.

2. **RELATION TO MSFD GENs DESCRIPTORS:** if the indicator could provide information for specific criteria (C) under any of the MSFD GENs descriptors (D), please select the respective descriptors, following the general guidelines from section 2.1.
3. **ASSESSMENT CRITERIA AND INDICATORS FOR D1/D2/D4/D6:** if the indicator could provide information for any of the specific indicators (I) listed under the criteria (C) of the 4 MSFD GES descriptors in the excel table (D1, D2, D4, D6), please select the respective indicators, following the general guidelines from section 2.1.
4. **BIODIVERSITY COMPONENTS:** this category refers to which biodiversity components the indicator is related to or is evaluating. In the case of a compound indicator (*i.e.* when the assessment accounts simultaneously for several biodiversity components) you should select all components it incorporates within the same entry (*row*). In this case you may need to select several components within this category:
- Select several options **from different fields** (or columns), applying the general guidelines from section 2.1 as adequate for the fields in question,
 - e.g.*, Benthic invertebrates (*column BL*) and Macroalgae (*column BK*);
 - Or select several options **within the same field** (or column),

- e.g., within Fish (*column BM*), for a Pelagic/Demersal fish ratio indicator, by selecting both (3) Pelagic fish and (5) Demersal fish options, applying instructions under that specific field;

NOTE: Categories adopted for Biodiversity Components followed the EU Commission Decision (2010)¹ and EU Commission Staff Working Paper (CSWP2012)⁵.

5. HABITAT TYPES: this refers to whether the indicator is related to a certain habitat (e.g. indicator to be applied for the survey of benthic invertebrates in shallow sublittoral sand habitats);

- a. This field is NOT related to whether it is a habitat indicator or not. This should instead be indicated in habitat related Indicators (I), under the Assessment Criteria (C) and Indicators (I) for D1/D2/D4/D6 (EU COM Dec 2010) (*columns AC to BF*);
- b. To select an option apply the general guidelines from section 2.1, as adequate for the fields in question;
- c. Check *Definitions spreadsheet* for details on some concepts regarding the available options.

NOTE: Categories adopted for Habitat Types followed the EU Commission Decision (2010)¹ and EU Commission Staff Working Papers (CSWP, 2011; 2012)^{6,5} where it was agreed that the "*Use of these types provides a direct link between the habitats assessed under Descriptor 1 and the substrate types to be assessed for Descriptor 6 (indicator 6.1.2, – different substrate types affected by physical damage) and to the European EUNIS habitat classification scheme*" (CSWP 2011, page 18)⁶.

6. PRESSURES: please fill in pressure related information if there is scientific evidence of a relationship between a specific indicator with a pressure in the list. If the indicator has furthermore been validated against particular pressure(s), please provide also the source(s) of that information (*column CO*).

7. GEOGRAPHICAL COVERAGE: this refers to areas where the indicator has been used, developed for, or would be suitable for use;

- a. **Marine sub-divisions or ecological assessments areas** (*column CR*) – select to which marine sub-area your indicator applies, applying the general guidelines from section 2.1 and treating each added option as a new entry in the table;
 - supporting maps *per* region are provided in the marine *subdivisions MAP spreadsheets* to help you locate your areas;

- In the case that the indicator is applicable in all Marine region or sub-regions selected previously in *columns CP* and *CQ*, then **select the option “all” from the dropdown list.**
- b. **EU Member State official subdivisions** (*column CS*) – following the MSFD⁷ requirements, in the case that official subdivisions have been defined at the MS level, please indicate them and add the source of information in the Observations *column DF*.

NOTE: according to the MSFD⁷, the subdivisions level is up to each EU Member State to define. For this survey, we have adopted well-established international criteria for smaller scale subdivisions or ecological assessment areas (*column CR*), in order to increase the spatial detail on the information collected. However, these categories are not binding concerning the MSFD.

8. EXISTING RELATED MONITORING:

- a. **Program associated** - if an indicator is related to more than one monitoring program, **indicate the respective name(s) under the adequate sub-field** (*columns CZ to DE*). You should **only enter them as a new entry (row)** in the table (respecting the general guidelines from section 2.1) if different programs imply differing features requested in previous fields (e.g., *different target values in different regions*).

3. References

1. EU Commission Decision of 1 September 2010 on criteria and methodological standards on good environmental status of marine waters (2010/477/EU).
2. HELCOM, 2012. Development of a set of core indicators: Interim report of the HELCOM CORESET project. PART B: Descriptions of the indicators. Balt. Sea Environ. Proc. No. 129 B.
3. Birk, S., Strackbein, J. & Hering, D., 2010. WISER methods database. Version: March 2011. Available at <http://www.wiser.eu/results/method-database/>.
4. Birk, S., Bonne, W., Borja, A., Brucet, S., Courrat, A., Poikane, S., Solimini, A., van de Bund, W., Zampoukas, N. & Hering, D., 2012. Three hundred ways to assess Europe's surface waters: An almost complete overview of biological methods to implement the Water Framework Directive. Ecological Indicators 18, 31-41.
5. European Commission (2012) Commission Staff Working Paper – Guidance for 2012 reporting under the Marine Strategy Framework Directive, using the MSFD database tool. Version 1.0. DG Environment, Brussels. pp164.
6. European Commission (2011) Commission Staff Working Paper – Relationship between the initial assessment of marine waters and the criteria for good environmental status. Brussels, 14.10.2011. SEC (2011) 1255 final.
7. Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive).

Sources of geographical information (15.03.2013):

Baltic Sea: (HELCOM sub-basins) http://www.helcom.fi/environment2/nature/en_GB/facts/

North-East Atlantic: (ICES statistical areas) <http://www.ices.dk/marine-data/maps/Pages/default.aspx>

Mediterranean & Black Sea: (GFCM Geographical Sub-Areas) <http://www.gfcm.org/gfcm/topic/16162/en>

Non-EU Seas: (FAO Major Fishing Areas) <http://www.fao.org/fishery/area/search/en>