



***Scientific data storage and transmission
under the future Data Collection Framework***

Feasibility Study

FINAL REPORT

Part 2

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Part 2

1. DESCRIPTION OF CURRENT SITUATION OF DATA STORAGE AND TRANSMISSION

This Section presents the current situation with respect to data collection and storage of data relevant to this study. The present situation is referred to as the “baseline scenario”.

The section first presents the current situation with respect to the access in MS to data collected under the Control Regulation (Section 1.1). Then, individual institutions are described with a common template. These include ICES (Section 1.2), the Joint Research Centre (JRC, Section 1.3), DG MARE (Section 1.4), GFCM (Section 1.5), other RFMOs (Section 1.6), Regional Sea Conventions (Section 1.7) and Eurostat (Section 1.8).

The chapter ends with a description of interactions between DCF data, CR data and other fisheries related data (Section 1.9).

1.1. Access to CR data

CR data are:

Other fisheries data collected by Member States to meet reporting obligations under EU legal instruments, and under RFMOs:

- *Data required for the collection of DCF data. This includes, for example, data collected under the Control Regulation enabling the collection of DCF data.*
- *Data collected under other legal instruments which overlap with DCF data. The relevant legal instruments are, in particular, the Marine Strategy, Framework Directive and the Eurostat Regulation.*
- *Data collected by Member States to meet obligations towards RFMOs, as far as not covered by DCF data, which overlap with DCF data.*

1.1.1. Access to Control data

Institutions providing data collected under the Control Regulation (thereafter “CR data” are listed in Annex 2.1. It shows that in most MS one organization is responsible for the compilation of the CR data and is the source of this data for the purpose of DCF.

Table 28 shows that in most MS, the institutes responsible for the DCF have real time on-line access to primary logbook data. Exceptions to this rule are in particular DE, NL, PT and UK SF as well as several Mediterranean countries (EL, ES, IT, MT).

➤ **Recommendation: On-line / real time access to primary data should be achieved by all MS.**

The most commonly used formats are Excel/Access and TXT/CSV. Some MS use Oracle, SAS or SQL.

Table 28. Overview of access to control data

	On-line access		Not on-line access
	Real time (format)	Not real time (format)	Not real time
Primary	<ul style="list-style-type: none"> • BG (Excel/Access, Oracle) • DK (SAS) • EE (almost all formats, no XML) • FI (Excel/Access) • FR DPMA¹ (XML,TXT/CSV) • EL (d: Excel/Access, TXT/CSV) • LT (almost all formats) • MT (d: FIS) • PL (Excel/Access, TSV) • SE SWAM² (all formats) • SI (Excel/Access, TXT/CSV) • UK MMO³ (a,b,c: SQL) 	<ul style="list-style-type: none"> • ES (a,b: Excel/Access) • UK MMO (d: SQL) 	<ul style="list-style-type: none"> • DE • FR IRD • EL (a,c) • IE (c) • IT • MT (a,b,c) • NL CVO⁴ • PT • SE SLU⁵ (a,c,d) • UK SFM (a,b,d)
Detailed			<ul style="list-style-type: none"> • EL (b) • IE (a,d) • SE SLU (b)
Aggregated		<ul style="list-style-type: none"> • BE (d: TXT/CSV) 	<ul style="list-style-type: none"> • BE (a,b,c) • ES (c,d)

Source: Study survey

(a) Logbooks; (b) Sales notes; (c) VMS; (d) Fleet Register

Member States which have not yet been included⁶: Cyprus; Latvia; Romania and Croatia.

Remarks:

- ✓ Ireland's National Correspondent does not have access to sales notes data.
- ✓ Malta's institution responsible for DCF (DFA) does not have a data provider, because CR data are collected by the institution itself.
- ✓ Netherlands' National Correspondent has online access to the control data but he responded the questionnaire as he was CVO/IMARES (institution responsible for data processing).
- ✓ UK MMO is the control data owner.

¹ DPMA: Directorate for Sea, Fisheries and Aquaculture.

² SWAM: Swedish Agency for Marine and Water Management.

³ MMO: Department of Agriculture, Northern Ireland; Marine Scotland; and Marine Management Organisation for England and the Welsh Government for Gales.

⁴ CVO: Centre for Fisheries Research.

⁵ SLU: Swedish University of Agricultural Sciences.

⁶ Member States which have not yet been included because they have not completed the questionnaire at the time of delivery of this report.

- ✓ UK SF does not work with VMS (c) data.

The MS which do not have on-line access receive usually files by e- mail in various common formats, but still they receive the primary data. Use of CD-ROMs is rather unusual. Other ways of data transfer are often SFTP-servers.

In most cases the data is provided frequently (monthly or quarterly) or upon request. In exceptional cases data is provided annually (see table 29).

Table 29. Reception of data, if not on-line access

	E-mail	CD-rom	Other
Excel / Access	<ul style="list-style-type: none"> • ES (d) • IT (a,b,d) • SE SLU (a,b,c,d) • UK SF (a,b,d) 	<ul style="list-style-type: none"> • FR IRD (c) 	<ul style="list-style-type: none"> • ES (c) – (ftp) • EL (a) – (interview) • MT (a,b,c) – in-house access / Excel
XML	<ul style="list-style-type: none"> • EL (b) 		
TXT/CSV	<ul style="list-style-type: none"> • BE (a,b,c) • FR IRD (d) • EL (c) • IT (c) • PT • SE SLU (a,d) 	<ul style="list-style-type: none"> • DE (c) 	<ul style="list-style-type: none"> • DE (a,b,d) – SFPT server • IE – SFPT file transfer • NL CVO - SFPT
Other			<ul style="list-style-type: none"> • FR IRD (a,b) – directly collected

Source: Study survey

(a)Logbooks; (b) Sales notes; (c) VMS; (d) Fleet Register

Table 30. Frequency of data reception, if not online and not real-time

	Data < 1 week lag	Data < 1 month lag	Data > 1 month lag
Monthly		<ul style="list-style-type: none"> • NL CVO 	<ul style="list-style-type: none"> • BE (a) • EL (a,b)
Quarterly		<ul style="list-style-type: none"> • DE (a,b,d) 	<ul style="list-style-type: none"> • BE (c) • FR IRD (c)
Yearly	<ul style="list-style-type: none"> • SE SLU (d) 	<ul style="list-style-type: none"> • SE SLU (a,b,c) 	<ul style="list-style-type: none"> • DE (c) • PT
Upon request	<ul style="list-style-type: none"> • EL (c) 	<ul style="list-style-type: none"> • IE (a,c) 	<ul style="list-style-type: none"> • BE (b) • ES • FR IRD (a,b,d) • IT • MT (a,b,c) • UK SF (a,b,d)

Source: Study survey

(a)Logbooks; (b) Sales notes; (c) VMS; (d) Fleet Register

1.1.2. Aggregation level

Table 31 shows that by far most MS have access to CR data which at primary level. Only Belgium and Spain (VMS) receive aggregated data according to DCF definitions. This means that all MS have ample or at least sufficient access to CR data required for the implementation of DCF surveys.

Table 31. Aggregation level of the data

Aggregation level	Countries
Primary	<ul style="list-style-type: none"> • BG • DE • DK • EE • ES (a,b,c,d) • FI • FR DPMA • FR IRD • EL (a,c,d) • IE (c) • IT • LT • MT • NL CVO • PL • PT • SE SLU (a,c,d) • SE SWAM • SI • UK MMO • UK SF
Detailed	<ul style="list-style-type: none"> • IE (a,d) • EL (b) • SE SLU (b)
According to DCF definitions	<ul style="list-style-type: none"> • BE

Source: Study survey

(a) Logbooks; (b) Sales notes; (c) VMS; (d) Fleet Register

1.1.3. Confidentiality

All institutes involved in DCF guarantee confidentiality of the CR data. In eight cases there are formal agreements with the data providers. Thirteen institutes do not have such agreement.

Table 32. Confidentiality

Formal agreement with data provider	No formal agreement with data provider
<ul style="list-style-type: none"> • BE (a,b,c) • IE (a,b,c) • FI (a,b,c) • FR DPMA⁷ (a,b) • FR IRD (a,b,c) • LT (a,b) • NL CVO (a,b) • SE SWAM (a,b,c) • UK SF (b,c) 	<ul style="list-style-type: none"> • BG (a,b) • DE (a,b,c) • DK (b,c) • EE (a,b) • ES (a,b) • EL (a,b) • IT (b,c) • MT (a,b) • PL (a,b,c) • PT (a,b) • SE SLU (a,b) • SI (a,b) • UK MMO (a,b)

Source: Study survey

Methods for guarantee confidentiality of primary data: (a) Login password); (b) Designated persons; (c) Primary data outside main DB

Remarks:

- ✓ Poland NC formal agreement with CR data provider is under preparation.

1.1.4. Data storage

Five MS store the CR data in the DCF DB, but most others keep the data in a separate DB. Several MS have declared that they do not keep the data in any DB. Evidently, MS which have an online access to the primary data may use queries directly in the CR DB.

Nine institutes declare not being able to link logbook and sales notes data, although this can be in some cases a useful cross-check.

⁷ DPMA (FR) has a formal agreement regarding the provision of data only for Sales Notes

Table 33. Data storage

		Storage of control data		
		DCF database	Other database	No database
Link of primary logbook and sales note data	Yes *	<ul style="list-style-type: none"> • FI (d) • LT 	<ul style="list-style-type: none"> • DE • DK • EE • FI (a,b) • FR DPMA • FR IRD • MT • SI • UK MMO 	<ul style="list-style-type: none"> • BG • FI (c) • PT
	No	<ul style="list-style-type: none"> • BE • EL • PL 	<ul style="list-style-type: none"> • IE • ES • UK SF 	<ul style="list-style-type: none"> • IT • NL CVO • SE SLU

Source: Study survey

(a) Logbooks; (b) Sales notes; (c) VMS; (d) Fleet Register

* SE SWAM is able to do the link but have not specified which database is used.

Remarks:

- ✓ In Slovenia CR data are stored in a separate DB directly connected with the DCF one.

1.1.5. Contacts with provider

Table 34 shows that there are intensive contacts between the institutes responsible for DCF and the providers of CR data. Only in case of BG contacts appear to be weak.

Table 34. Contacts with data provider

MS / Institute	Regular meetings	Solving technical problems	Solving data definition problems	Feedback
BE	Yes	Yes	Yes	Yes
BG	No	No	No	No
CY				
DE	Yes	Yes	Yes	Yes
DK	Yes	Yes	Yes	Yes
EE	No	Yes	Yes	Yes
EL	No	Yes	Yes	Yes
ES	Yes	Yes	Yes	Yes
FI	Yes	Yes	Yes	Yes
FR (DPMA)	Yes	Yes	Yes	Yes
FR (IRD)	Yes	Yes	Yes	Yes
IE	No	Yes	No	Yes
IT	No	Yes	Yes	Yes
LT	Yes	Yes	Yes	Yes
LV				
MT	NR	NR	NR	NR
NL (CVO)	No	Yes	Yes	Yes
PL	No	Yes	Yes	Yes
PT	Yes	Yes	Yes	Yes
SE (SLU)	Yes	Yes	No	Yes
SE (SWAM)	No	Yes	Yes	Yes
SI	Yes	No	Yes	Yes
UK (MMO)	No	Yes	Yes	No
UK (SF)	Yes	Yes	Yes	Yes

Source: Study survey

NR: Not relevant

1.2. ICES/RDBs

1.2.1. Summary

- ICES manages three biological DCF databases namely DATRAS for survey data, RDB-FishFrame for national data and InterCatch for stock assessment, but also eight environmental databases. ICES does not store data related to the nine environmental marine indicators requested under the DCF.
- ICES implemented the tools needed for the processing of the data from the individual biological data to the stock assessment data. This was planned in two steps: raising of detailed data in the RDB-FishFrame and raising of stock data in InterCatch. At the

moment, as far as the first stage is concerned, the tools and databases are designed and ready for use, but the raising process needs to be ratified by data transmitter. The second stage is fully operational for years. The complete process is expected to reduce the burden as MS should deliver detailed data to the RDB-FishFrame only and all other data needed will be raised, derived or extracted from the RDB-FishFrame. In addition, it will harmonise and document the methods. Non-EU countries are also invited to deliver data to the RDB-FishFrame, but only Norway showed little interest as observer. The stock data would be more accurate if all countries fishing in the area would provide the requested information.

- RDB-FishFrame is developed in a modular way which could facilitate the sharing of ad hoc developments between different institutions. As an example, standard tools like COST could be integrated at the regional level, specific modules could be foreseen to tackle scientific issues encountered for a given basin.
- ICES has the technical capacity and infrastructure to manage the databases as well as the legislative background to be the central point for the coordination of data collection, storage, processing, quality checking and dissemination.
- ICES has experience in connecting some of its databases to EmodNet Biology network . DATRAS data are available on ICES Data Portal (EcoSystemData). Data warehouse was used as an extension for DATRAS to map visualisations and integrate with other non-DCF datasets. Web services from ICES Data Portal feed information to EmodNet Biology.
- ICES has also implemented the use of common geographical references to be able to map information coming from different domains in the spatial Facility/Geonetwork which holds the ISO 19115 metadata of the catch and survey datasets. This network is INSPIRE directive compliant.
- ICES does not store data related to the nine environmental marine indicators requested under the DCF.

1.2.2. Data Storage and Access

Overview

ICES collects and disseminates DCF data stored in three main database systems:

- DATRAS system: contains primary biological data (i.e. individual measurements) collected during scientific surveys like: Baltic International Trawl Survey (BITS), International Bottom Trawl Surveys (IBTS) in the Western and Southern Areas and Beam Trawl Survey (BTS) as well as calculated transversal data (Cpue).
- RDB-FishFrame system: is designed to cover the three regional biological databases (RDBs) on the Baltic, the North Sea & Eastern Arctic and the North Atlantic regions. RDB-FishFrame holds the data from the three basins in the same database. In our text, we consider that they are three regional databases whereas we clearly understood that in physical terms it refers to a single database containing all data. Until now, the status of

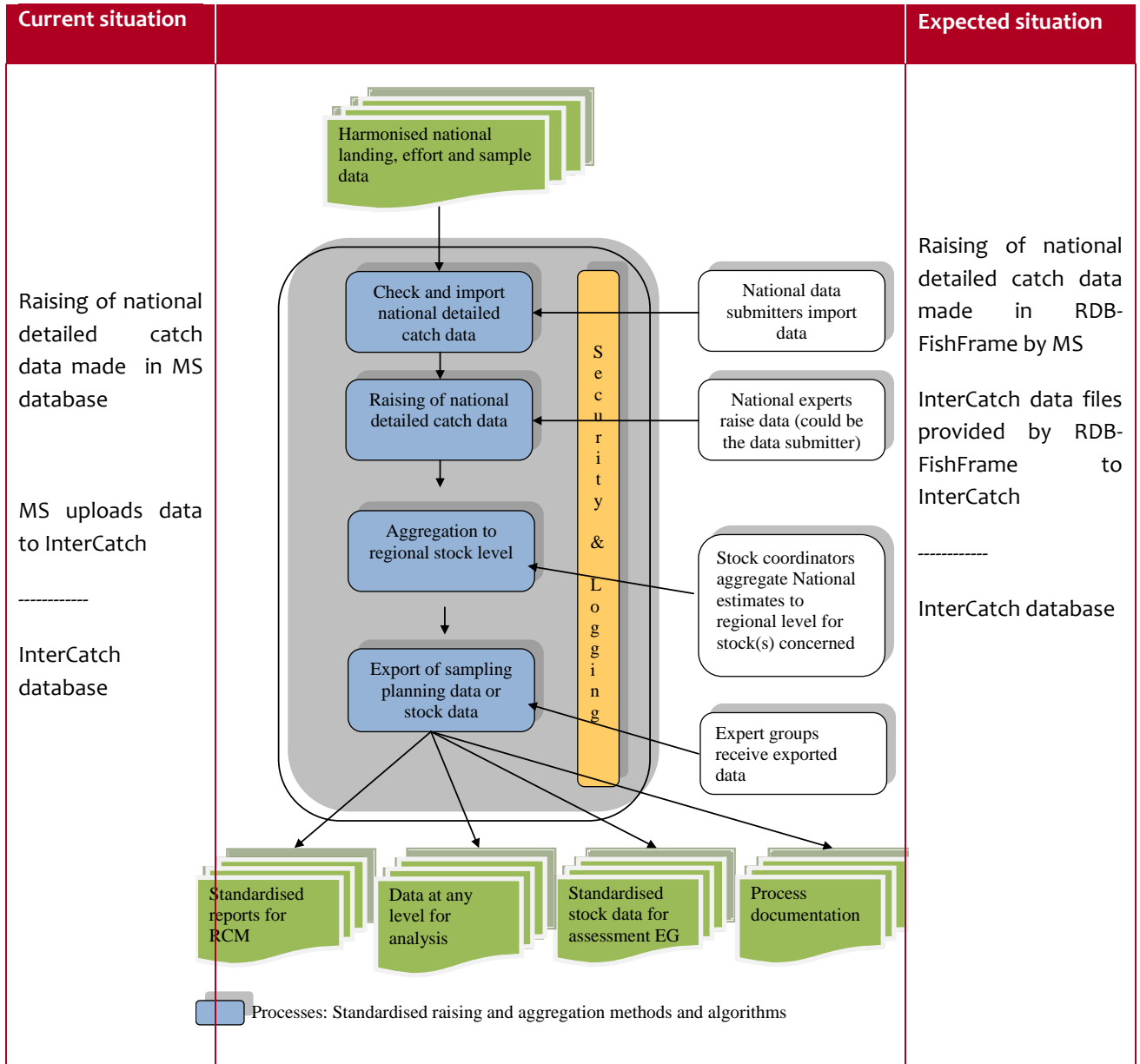


the RDB-FishFrame is experimental. RDB-FishFrame started storing individual biological measurements (already millions of records) and allows data transmitter to raise the national data.

- InterCatch system: allows storing national catch data: Landings, discards, biological sample and effort data raised at national level for being able to raise stock evaluation and provision of advice on the stocks in the North East Atlantic.

ICES implemented the tools needed for the processing of the data from the individual biological measurements to the stock assessment data. ICES does not store data related to the nine environmental marine indicators requested under the DCF.

Figure 9. Processing of fisheries data from individual data to stock data



Source: ICES diagram placed in the context of the feasibility study

ICES expectation for the future is to have the detailed data stored in RDB-FishFrame and that the national transmitters raise the national data directly using the RDB-FishFrame automated tools and their expertise. The RDB-FishFrame should help the national data transmitters by giving them a common tool to do the operations done at national level for feeding the InterCatch database. Using the RDB-FishFrame, the process can be automated (in some MS, the raising to national level is made almost manually and requires a lot of work), methods can be standardised, the development and maintenance of the tool is ensured and the data are directly available at the end of the process in the InterCatch format. The national data could then be automatically made

available in InterCatch to permit further processing by the stock coordinators. The connection between RDB-FishFrame and InterCatch is for the moment done manually meaning the data can be exported using a specific function from RDB-FishFrame in an InterCatch compatible format and the exported file can be imported in InterCatch using an upload function.

Technically, the RDB-FishFrame database is accessible online and ready for receiving the data since 2012. Now there is a need for a deeper analysis/validation of the RDB-FishFrame procedures, meaning the data transmitters should compare the data loaded in RDB-FishFrame and raised to the national level with the data they prepared for InterCatch. This was done by DTU-Aqua for the Baltic Sea but needs to be also tested for other MS. Tests have to be carried out on fish stocks with different characteristics, e.g. vulnerabilities to fishery, migratory distances and reproduction strategies for comparison purposes.

If the RDB-FishFrame aggregation tool is satisfactory, it is expected that the burden will be considerably reduced (especially for MS which do not have specialised tools developed) and individual data will be made accessible for further analysis in a single place. In addition, as the RDBs are in the same RDB-FishFrame system, it will be possible to compare individual data from different sea basins.

The ICES implemented for years the DATRAS and InterCatch systems, and RDB-FishFrame is on test since 2012.

Table 35. ICES Databases – names and domains

Name of the database/system	Domain covered by the database	Production / dissemination DB
DATRAS	Biology (Trawl Survey Data including catch and effort) and some environmental data	Production/dissemination
InterCatch	Biology (for the commercial catches): (stock; métier, Catch / landing; Effort)	Production/dissemination (very limited group of users, so it may be seen as Production only)
Regional Database- RDB-FishFrame (RDB)	Biology: (stock; métier, Catch / landing; Effort, environment)	Production/Dissemination

Source: Feasibility study survey

The three systems are hosted on ICES servers managed internally by 2 databases administrators.

Servers are regularly backed up and well secured. There are 11 people only working with information systems/databases. For the DATRAS, InterCatch and RDB-FishFrame databases, there are 4 full-time staff dedicated; one Project Manager, two Data System Analyst, and one Data Officer. In addition there is a team of 4 IT staff that support the ICES infrastructure.

Documentation is available. The developments are done in house. Nevertheless for RDB-FishFrame, outsourced developments could be envisaged in the future.

Sharing of information:

- Eurostat shared data for catches in area 27 with ICES under a partnership agreement.
- For many years there has been close collaboration between ICES, Eurostat and FAO in fishery statistics. One of the field of cooperation was the implementation of SDMX as an international standard for fisheries information.
- ICES holds datasets for DCF but also oceanic and environmental datasets for HELCOM, OSPAR, EIONET, AMAP monitoring programs⁸.
- ICES has made data calls for VMS and logbook data in connection with providing scientific advice to Regional Sea Conventions (e.g. HELCOM) and fisheries commissions. In most cases, ICES did not receive any information. In the new joint call with HELCOM (Oct 2013), ICES made provision to hold the possible received data on a secure https server at ICES⁹.
- ICES has an agreement with NEAFC to receive VMS and logbook data on a twice yearly basis.
- The RDB-FishFrame were thought also to help Member States coordinating their national programmes with other Member States in the same marine region within the RCMs (Article 5(1) of 199/2008), easy the task of MS in raising individual data to national data. Having a common data platform is useful also for end users RCM, InterCatch/Assessment expert group, and potentially for contributing to the MS annual reports to EC and STECF data/reports.

Connection

The three systems are hosted and managed internally. They are accessible through the intranet or the internet but with specific limit depending on the type of users/logging.

⁸ <http://admin.ICES.dk/Submissions/index.aspx?t=1>

⁹ Information from Neil Holdsworth, ICES

Table 36. Access to the ICES database

	Internal staff	Special users group	Public
DATRAS warehouse	Primary data Aggregated data Open Access/logging	Primary data Aggregated data Open access/logging (for loading) Limit in download size of total export	Primary data Aggregated data Open access for dissemination Limit in download size of total export
InterCatch	Aggregated data Open access	Aggregated data Logging for the Working group (with Assessment relevance) will allow full access to data Different access level Limit in total export	
RDB-FishFrame	Detailed data Aggregated data Open access	Detailed data (RCM) Aggregated data(WG) Logging Different access level depending on the role Limit in total export	

Source: Feasibility study survey

3.2.2.a – DATRAS

System and database structure of DATRAS database

There is one web front-end to the database in the DATRAS where all the tasks can be done, loading data, screening data, downloading data and updating the data warehouse.

The DATRAS system includes different components among others:

- DATSU(ICES data screening utility): All data are ran/uploaded through the data screening utility before they are loaded into the DATRAS database. The utility consists of:
 - a database on a SQL server where the exchange format and all check descriptions are set up,
 - a Visual Basic program which performs all the checks,
 - an Internet front-end where the data submitter can screen their data
 - an internal access front-end to the SQL database where exchange formats and checks can be set up.

If errors are encountered, the file will not be loaded. Warning can also be indicated but will not prevent from loading the data.

- RECO (ICES Reference Code Vocabularies): Common data coding system for all ICES data systems.
- DATRAS database: Data storage for primary trawl survey data. It consists of a database on a SQL server and an ACCESS front-end for data management and calculation of indices.
- DATRAS data warehouse: Data storage for calculated trawl survey data. Consists of a database on the SQL server with an Internet front-end from which data can be downloaded.
- WoRMS¹⁰ (World Register of Marine Species) web service connection (species id's).
- DAD database (Database on Accessions and Documentation). The database is a common ICES database for registering data submissions and showing processing status.
- DATRAS web project and DATRAS windows application which contains all the calculation procedures and algorithms logics.
- DATRAS report application.

Table 37. DATRAS technical and functional issues analysis

Technical requirements	
Trends	MS SQL server 2012, Visual Basic
Connection	Internet and intranet
Cost : software purchase/ maintenance fees	Use of proprietary solution SQL server version for the database/data warehouse
Interoperability with other system and web services	<p>InterCatch and DATRAS share the same reference code management system (ICES Vocabulary) and the quality checking database system (DATSU Screening Utility.) DATRAS data warehouse is connected to Geonetwork¹¹ (a catalogue application to manage spatially referenced resources) using a geoserver¹² through the ICES “Ecosystem web data” portal being part of the EMODNET Biology. Allowing connecting DCF data with other non DCF datasets. Geonetwork is a catalogue application to manage spatially referenced resources. The description of all ICES datasets incl. DATRAS has been manually created for each dataset directly in the ICES GeoNetwork node (INSPIRE directive compliant.). Geonetwork provides powerful metadata editing and search functions as well as an embedded interactive web map viewer. It is currently used in numerous Spatial Data Infrastructure initiatives across the world.</p> <p>Use of web service against WORMS species catalogue from marinespecies.org</p>
conformity to standard	<p>ICES nomenclature used in DATRAS are DCF compliant</p> <p>The updates of the DCF nomenclatures are provided by the survey working groups.</p>

¹⁰ <http://www.marinespecies.org/index.php>

¹¹ GeoNetwork open source is a catalogue application to manage spatially referenced resources. It is a standards based and decentralized spatial information management environment, designed to enable access to geo-referenced databases, cartographic products and related metadata from a variety of sources, enhancing the spatial information exchange and sharing between organizations. GeoNetwork opensource software is to improve the accessibility of a wide variety of data, together with the associated information, at different scale and from multidisciplinary sources, organized and documented in a standard and consistent way.

¹² Geoserver : GeoServer is an open source software server written in Java that allows users to share and edit geospatial data. Designed for interoperability, it publishes data from any major spatial data source using open standards.

Technical requirements	
Referential	ICES vocabulary : common data coding system for DATRAS and InterCatch WoRMS (World Register of Marine Species)
Reusability	The modules are separated and some are reused by different applications
Updatability/genericity : customisation of the tests	The system does not allow managing generic Tables. Some test in DATSU can be set in place and customised by DATRAS administrator (NOT by users) using a dedicated user interface. New tests implementation requires new developments.
Data security and Access level(due to confidential data)	Security: DATRAS is backed up once a day. The web server code is controlled and secured centrally in a Team Foundation Server, which is backed up once a day. Open access for dissemination and log in with Different level of access in a survey dataset (at Survey, quarter, year, country and species depended) for the transmission.
Follow up of user requests	For existing online products ICES does not record the email and purpose of use, in order to make it easier for end users- However, for new data products requests ¹³ ICES documents the process.
Functional requirements	
Meta data management	DAD database: Database on Accessions and Documentation. The database is a common ICES database for registering data submissions and showing processing status. It should be possible for the data user to see what data have been loaded and the status of the data and this information has to be provided by the data submitter when submitting data. Two types of status exists for the data (preliminary/final , complete/incomplete)
Upload facilities	Upload to be managed by data provider, database administrator in cases of technical problems
Automated validation	Embedded validation at upload, advanced validation checks can be performed and automated.
User-friendliness and easiness to use	The public interface of DATRAS is easy to use.
Availability of technical documentation	Available on DATRAS web page ¹⁴
User support	Available
Resource needed for the maintenance	Internal resources

Source: Feasibility study

Aggregation level - DATRAS

For the calls related to 2013, DATRAS data are provided by month and at DCF level 5 (ICES)¹⁵ for the catch area, DCF level 4¹⁶ for the gear; DCF level 5¹⁷ for target species and DCF level 6¹⁸ for mesh size and are therefore compliant with the DCF requirements (see Annex 2.3.).

¹³ <http://www.ices.dk/marine-data/guidelines-and-policy/Pages/Requesting-data-from-ICES.aspx>

¹⁴ <http://www.ices.dk/marine-data/data-portals/Pages/DATRAS.aspx>

¹⁵ Dec 2010/93/EU: Adopting a multiannual Community programme for the collection, management and use of data in the fisheries sector for the period 2011-2013 - Appendix I

¹⁶ Appendix IV 2010/93/EU

¹⁷ Appendix IV 2010/93/EU

¹⁸ Appendix IV 2010/93/EU



The DATRAS warehouse contains Exchange data as uploaded in DATSU as well as aggregates at higher level presented in data products (see Annex 2.2.).

Data processing and estimations - DATRAS

The trawl survey data held at ICES is overseen by the trawl survey working groups that contribute the data from their national offices. (Example of IBTSWG working group).

Step 1: data submission

National data submitters check quality and upload national trawl survey data using the web-interface. Data are submitted per survey, year, quarter, country, vessel, and gear. When the files are being uploaded to DATRAS, the submission is automatically registered in the Database on Accessions and Documentation (DAD).

Data go through a screening procedure and the data submitter must rectify all errors before the data can be loaded into the database.

Step 2: advanced validation checks in DATRAS

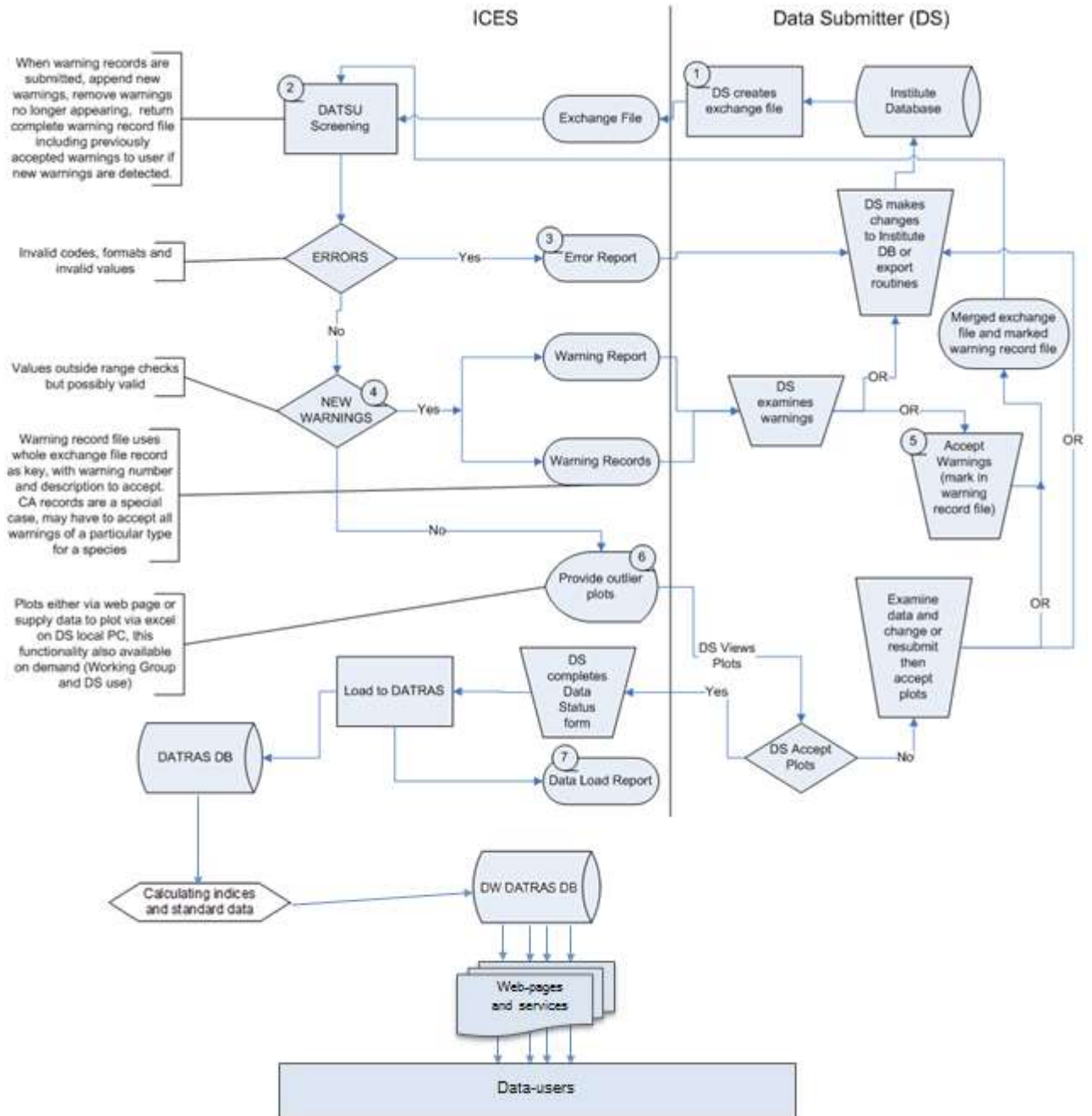
The second stage of the process, after the data are screened for errors, loads the data into the DATRAS database. After loading, the data are checked by comparing the age/length data against age/length data from own imported data of the cruise.¹⁹ Outliers are checked and errors are corrected by the survey data transmitter.

Step 3: preparation of indices and aggregation stored in DATRAS warehouse

The third stage creates indices and standard aggregations of the data, which are calculated from the checked data. The results are transferred to the data warehouse from where they can be accessed through the web.

¹⁹ if in a survey-haul not enough individual fish are caught to process a statistical robust age length relation analyses, these missing information can be obtained from other hauls from the same research survey.

Figure 10. DATRAS data flow



Source: ICES



3.2.2.b– InterCatch

Database structure - InterCatch

The InterCatch information system is designed as a simplified uniform data handler for fisheries commercial catch data submitted to ICES. There are two basic concepts underlying InterCatch:

- Stock and Year: ‘Trial’ or a ‘Final’ status. Data sets in the Final status cannot be deleted, but improved Trial data can be saved as to overwrite the old Final dataset.
- Allocation scheme: the possibility to fill in missing age or length data from unsampled catches by an allocation. Unsampled data can be interpolated with data from sampled, similar data sets using weighting key when referring to more than one data set.

The InterCatch system is then filled in with national raised fisheries data. The final output is stock assessment data raised from the different national inputs.

Table 38. InterCatch technical and functional issues analysis

Technical requirements	
Technical trends	MSQL Server 2008 R2
Connection	Internet and intranet
Cost : software purchase/ maintenance fees	Use of proprietary solution SQL server version for the database/data warehouse meaning not free software.
Interoperability with other system and web services	<ul style="list-style-type: none"> - InterCatch and DATRAS share the same reference code management system (ICES Vocabulary) and the quality checking database system (DATSU). - From the RDB-FishFrame national data can be exported into the InterCatch format and the data can then be imported into InterCatch. At the moment this is a manual process done over the internet, but it is a top priority to make this process automatic. Since both databases are stored on servers with direct access between them this is the easiest, safest and cost efficient way.
Conformity to standard	ICES nomenclatures used in InterCatch are DCF compliant.
Referential	ICES vocabulary
Reusability	The modules are separated and some are reused by different applications
Updatability/genericity : customisation of the tests	Some test in DATSU can be set in place and customised by administrator (NOT by users) using a dedicated user interface.
Data security and Access level(due to confidential data)	<p>Security: Incremental backups are taken every 15 min. The web server code is controlled and secured centrally in a Team Foundation Server, which is backed up once a day.</p> <p>Access is performed through Logging linked to different roles (data transmitter, stock coordinator, ...)</p>
Follow up of user requests	No system in place, access is limited to a limited number of experts.
Functional requirements	
Meta data management	None
Upload facilities	Upload to be managed by data provider, database administrator assists in cases of technical problems.
Automated validation	Embedded validation at upload; advanced validation checks are performed and are automated.
User-friendliness and easiness to use	The interface of InterCatch is reserved to experienced users. It is not self-explanatory.
Availability of technical documentation	<ul style="list-style-type: none"> - User manual²⁰ - InterCatch exchange data manual²¹ All directly accessible from the InterCatch portal
User support	Available
Resource needed for the maintenance	Internal resources

Source: Feasibility study

²⁰ <http://www.ICES.dk/marine-data/Documents/InterCatch%20User%20Manual%20Doc1-10.pdf>

²¹ <http://info.ices.dk/datacentre/InterCatch/IC-ExchFormat1-0%20Doc1-8.pdf>

Aggregation level (variables and dimensions) - InterCatch

For the calls related to 2013, InterCatch stock related, métier related, landing and effort data are aggregated by month and at DCF level 6-, rectangle (ICES)²² and 6 length classes for the vessel size²³ are therefore compliant with the DCF requirements as indicated (see Annex 2.5.).

Data processing and estimation ICES - InterCatch

All national institutes should import their own national raised catch data directly into InterCatch before the assessment working groups meet.

National data submitters upload national aggregated commercial catch, effort and sample data into InterCatch using the web-interface.

The assigned stock coordinator logs in to InterCatch and raises and aggregates all national data to stock level. Finally the stock coordinator exports the aggregated data for the stock assessment expert groups.

Figure 11. Workflow showing main steps in InterCatch

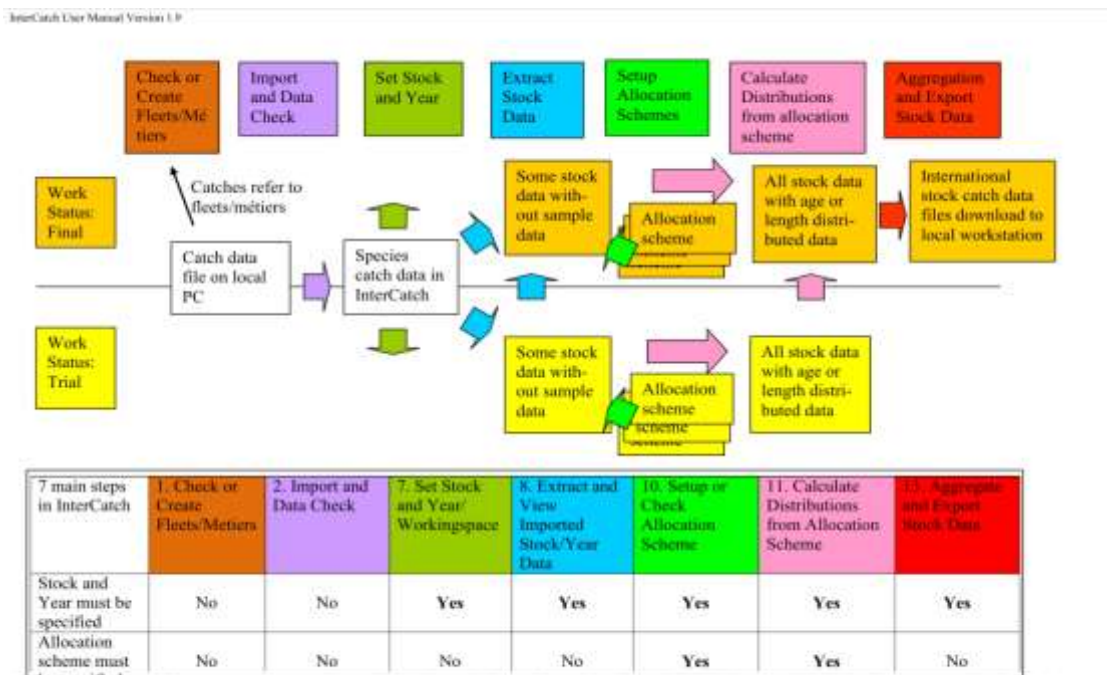


Figure 11. Diagram of the seven main steps in InterCatch, where Stock and Year 'Trial' is yellow and Stock and Year 'Final' is orange. The table below shows in which steps it is needed to specify Stock and Year and Allocation scheme.

Source: ICES, InterCatch User Manual

²² Dec 2010/93/EU: Adopting a multiannual Community programme for the collection, management and use of data in the fisheries sector for the period 2011-2013 - Appendix I

²³ Appendix IV 2010/93/EU

3.2.2.c - RDB-FishFrame

The RDB-FishFrame system was migrated to, and hosted by ICES in August 2012. The purpose was to implement transparent and standardised ways to raise national data and aggregate data for different end-users and increase usability and availability of the data. The system is operational but needs to be further tested by users.

As stated on ICES web site, “the RDB-FishFrame is a tool to assist in a regional approach to survey design and data collection, it support the Regional Coordination Meetings for the Baltic, the North Sea & Eastern Arctic and the North Atlantic. At the moment only national data submitters, stock coordinators and members of expert groups can have access to the system”

Since 2013, ICES secretariat removed specific blocking tests to facilitate uploading process for MS.

The Regional Databases were populated by data calls from RCM chairs in 2012 and 2013. They contain trip information, species and station, biological characteristics (sex, maturity, age, weight, length) as well as data on landings, capacity and effort.

The following developments are foreseen for next year(s):

1. Development of additional tools for analysis and data tabulating to support regional coordination leading to the development of output reports providing:
 - Overview of data status by region; data coverage;
 - Support the planning of future regional based sampling schemes;
 - Overview of potential areas for task sharing between Member States.
2. Testing of trial stocks from different expert groups for national raising, by borrowing age-length keys from own and/or other countries and correct functionality.
3. Streamline the interfacing with InterCatch by developing functionalities which will automatically move data to InterCatch, when data have been raised to a certain level.
4. Explore options and cost implications of implementing of external tools (i.e. COST²⁴) in the RDB-FishFrame.
5. Automatisation of data calls procedures.
6. Development of more flexible structure to handle correct processing of design based sampling schemes to address regional differences in approach.
7. Development of procedures to ensure confidentiality on individual vessel level for the landings and effort data and the value of the landings.
8. Finalisation of data access policy, in coordination with DC-MAP

²⁴ COST: tool for assessing the accuracy of the biological data and parameters estimates collected for stock assessment purposes. The mathematical procedures for precision calculation include those based on analytical formulas (for probabilistic samples) and replication methods (bootstrap, for non-probabilistic samples).

The logo for cofad, featuring the word "cofad" in a bold, blue, sans-serif font.The logo for devstat, featuring a stylized red 'd' with two black dots above it, and the word "devstat" in a red, lowercase, sans-serif font below.The logo for FRAMIAN, featuring a square with a diagonal line from the top-left to the bottom-right, and the word "FRAMIAN" in a bold, black, sans-serif font below.The logo for GOPA, featuring the word "GOPA" in a bold, green, sans-serif font, with "WORLDWIDE CONSULTANTS" in a smaller, black, sans-serif font below.

Database structure – RDB-FishFrame

The RDB-FishFrame is an open source web based data warehouse application, accessible via <https://www.rdb-FishFrame.org/Default.aspx>.

The following data type can be uploaded in RDB-FishFrame:

- Commercial sampling: sampling of commercial catches at sea, in the port or at the market.
- Commercial landing statistics.
- Commercial effort statistics.

RDB-FishFrame system holds the data from the different marine basins in one single database.

Table 39. RDB-FishFrame technical and functional issues analysis

Technical requirements	
Technical trends	MSQL Server 2008 R2, Net 2.0, AjaxMS analyser, Dundas charts/map and R
Connection	Internet and intranet
Cost : software purchase/ maintenance fees	Use of proprietary solution SQL server version for the database/data warehouse, so not a free solution.
Interoperability with other system and web services	From the RDB-FishFrame raised national data can be exported into the InterCatch format and the data can then be imported into InterCatch. At the moment this is a manual process done over the internet, <u>but it is a top priority to make this process automatic</u> . And since both databases are stored on servers with direct access between them this is the easy, safe and cost efficient. The “validation web service” exists outside the RDB-FishFrame. It can be used to enable other institutes to incorporate RDB- FishFrame exchange format validation in their own application without writing new validation code.
Conformity to standard	RDB-FishFrame uses DCF nomenclatures.
Referential	DCF compliant, compliant with the other referential used at ICES
Reusability	RDB-FishFrame can be used at national level (used in Denmark) or regional level
Updatability/genericity : customisation of the tests	Use of XML, DSD and XML Query Language: Data validation in the RDB-FishFrame is done through XML. All non XML files uploaded in the RDB-FishFrame are converted to XML for format validation and data checking. Checks are performed using XSD validation (XML schema definition) which allows performing structural, data type, range, pattern and enumeration validations. Dependency consistency checks are implemented with the XML Query Language. When creating a new check the editor supplies a template query making it fast and easy to construct new checks. The editor also supplies buttons for compiling the query and testing it on arbitrary XML files.
Data security and ccess level (due to confidential data)	Security: Incremental backups are taken every 15 min for the RDB-FishFrame. The web server code is controlled and secured centrally in a Team Foundation Server, which is backed up once a day. Access is performed through logging linked to different roles (data transmitter ...)
Follow up of user requests	RDB-FishFrame is for the moment limited to national expert
Functional requirements	
Meta data management	RDB-FishFrame contains also some metadata for the raising and extrapolation calculation Monitoring of the data upload is possible.
Upload facilities	The upload of file is managed by data provider. When a file fails validation during upload an error report is created and presented to the user. The error report is used for notifying the user of errors in his/her exchange format file and gives him/her an explanation of why the file didn't upload.
Automated validation	Embedded validation at upload, advanced validation checks can be performed after.
User-friendliness and easiness to use	Sophisticated tools requiring a good understanding by the users.

Functional requirements	
Availability of technical documentation	RDB-FishFrame documentation exists. Standard data exchange format ²⁵
User support	Available
Resource needed for the maintenance	Internal resources

Source: Feasibility study

Aggregation level (variables and dimensions) – RDB-FishFrame

For the calls related to 2013, RDB-FishFrame stock related, métier related, landing and effort data are provided by month and at DCF level 6 by ICES rectangle and 6 vessel length classes²⁶ (see Annex 2.3).

As a summary, the detail level is compliant or more detailed than DCF requirement except for the biological métier-related, catch/landings and effort the resolution is less detailed than DCF requirements.

The biological stock and métier-related data the time dimension is in a date and time stamp. The catch/landing and effort data are on monthly or quarterly basis.

Data processing and estimations – RDB-FishFrame

National data submitters upload national detailed commercial catch, effort and sample data into the RDB using the web-interface following the format described in data upload section.

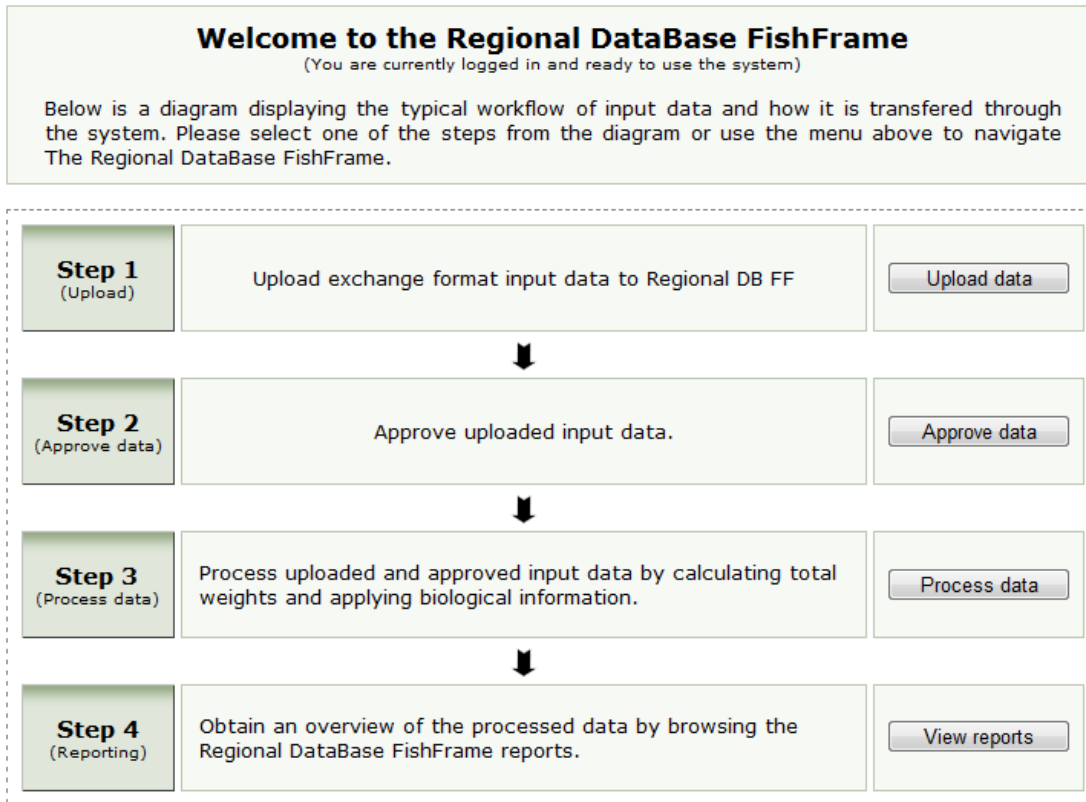
Input data can have two statuses: “not approved” (meaning trial/exploratory/working) or “approved”. The status of the data is always apparent.

The national transmitter can further check the data, raise and release the data at aggregated national level.

²⁵ [http://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20\(CRR\)/crr296/CRR%20296.pdf](http://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/crr296/CRR%20296.pdf)

²⁶ Appendix III 2010/93/EU

Figure 12. Workflow of data in RDB-FishFrame (screen shot from RDB-FishFrame regional database)



Source: ICES (print screen from RDB-FishFrame)

[Raising and extrapolation \(summary of information collected from the RDB-FishFrame 5.0 documentation\)](#)

After the input data has been uploaded, this data processing is made:

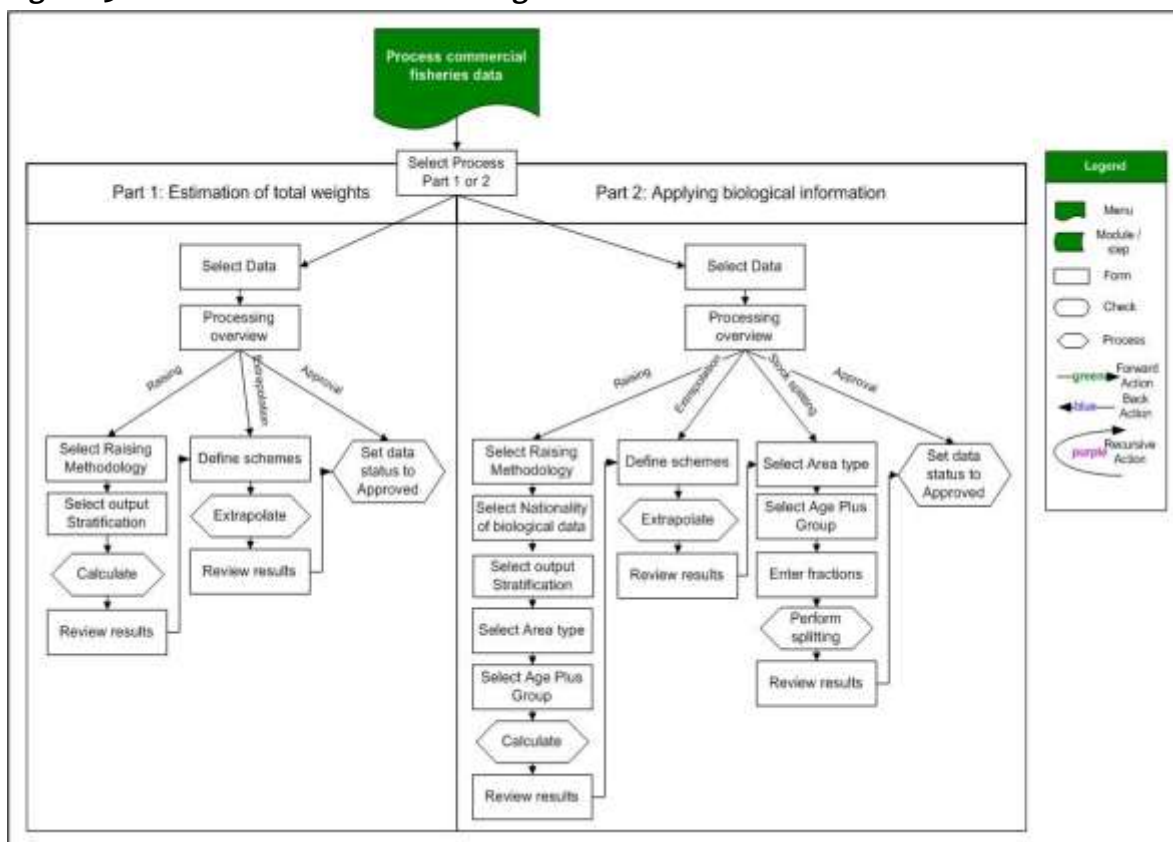
- Part 1: area-based estimation of total catches (landing+discards): calculation of total landing weights and discards weights.
- Part 2: stock-based estimation of the biological details: it adds biological information to convert the total weight into total numbers and numbers at length and age together with mean length and weight.

In each part, the following modules are successively run:

- Raising module: application of a selected raising scheme (methodology and stratification). Results are displayed.

- Extrapolation module: selection of an extrapolation scheme (extrapolation rules, stratification etc.) needed to complete the dataset through extrapolation into non-sampled strata using existing results. Results are presented.
- Stock splitting (only for part 2): targets data where area, species and season has not enough information to infer the stock identifier unambiguously. In this module the user must enter fractions for each stock in each area for each age; this is then used to split the 'mix-stock' into real stocks.
 - Status: approval of data by the user if results are satisfactory.

Figure 13. RDB-FishFrame Workflow diagram



Source: FishFrame 5.0 documentation

1.2.3. Data Upload

3.2.3.a - DATRAS

Procedures

DATRAS data calls are made for the survey working group aiming at validating the survey. DATRAS data are used as input for other working groups.

Frequency of updates of DATRAS depends on the survey.

For all DATRAS uploads, the deadline is 2 weeks before the start of the meeting of the survey groups. Text data files are uploaded on the DATRAS database using a secured http connection (https ASP.NET) or sent by email.

The transmission calendar is compatible with the data availability.

All users can monitor the data transmission by running queries on the DAD database updated when data are uploaded in DATRAS.

We refer in the table bellow to dates of the WG meetings, and to period of the execution of the survey, which must be always in the same time of the year, for statistical consistency.

Table 40. Data calls for uploading in DATRAS and main ICES WG coordinating and conducting the Research surveys

Data call uploaded in DATRAS	Domain
<p>ICES Baltic International Fish Survey Working Group (BITS) 26-31/03/2012 21-25/03/2013</p> <p>National parts of the international coordinated fish surveys should be carried out in the first quarter between 15 February and 31 March (spring survey) and in the fourth quarter between 1 and 30 November (autumn survey).</p>	<p>Baltic International Trawl Survey (BITS) Data of BITS are used for estimating different stock indices and stock parameters for Baltic cod and flounder It is described in the BITS manual (https://DATRAS.ICES.dk/Documents/Manuals/Addendum_1_WGBIFS_BITS_Manual_2011.pdf)</p>
<p>ICES International Bottom Trawl Survey Working Group (IBTSWG) 27-30 /03/2012 8-12/04/2013</p> <p>Fish surveys should be carried out in the first and third quarter of the year Provisional data obtained from the North Sea and Skagerrak/Kattegat should be submitted to the quarterly coordinator as soon as possible after completion of the cruise. Final data should only be submitted to the ICES Data Centre after the national institute has checked the data using official checking programs issued by ICES.</p>	<p>International Bottom Trawl Surveys in the Western and Southern Areas & in the North Sea and Kattegat/Skagerrak area “IBTSWG coordinates fishery independent multispecies bottom-trawl surveys within the ICES area. These surveys aim to provide consistent and standardized data for examining spatial and temporal changes in (a) the distribution and relative abundance of fish and fish assemblages; and (b) of the biological parameters of commercial fish species for stock assessment purposes. - IBTS North Sea, Skagerrak, Kattegat (NS-IBTS) - IBTS western and southern areas</p> <ul style="list-style-type: none"> • Scottish Surveys (ROCKALL,SWC-IBTS) • Northern Ireland Survey (NIGFS) • Irish Surveys (IE-IGFS) • English Surveys • French Surveys (EVHOE) • Spanish Surveys (SP-NORTH,SP-PORC) • Portuguese Surveys (PT-IBTS) <p>It is described in the Manual for the International Bottom Trawl Surveys in the Western and Southern Areas (https://DATRAS.ICES.dk/Documents/Manuals/Addendum_2_Manual_IBTS_Western_and_Southern_Areas_Revision_III.pdf) and in the North Sea Kattegat/Skagerrak area (http://www.ICES.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20%28ISP%29/SISP1-IBTSVIII.pdf)</p>
<p>ICES Working Group on Beam Trawl Surveys (WGBEAM) 5-8 /06/2012 23-26/04/2013</p> <p>5 nations (Netherlands, UK, Germany, Belgium, France)</p> <p>Survey dates are fixed annually scheduled between week 30 and week 45 depending on country.</p>	<p>Beam Trawl Survey (BTS) “Offshore survey” It is described in the BTS manual dated from 2009: (http://DATRAS.ICES.dk/Documents/Manuals/WGBEAM_Manual.pdf).</p> <p>Each country has developed own continues methodology starting from 1988 -2007. <u>Note:</u> WGBEAM (2013 WGBEAM report) recommends that as the Adriatic survey has met the full set of criteria to be coordinated by WGBEAM, it to be included in the list of coordinated surveys. RCM MED&BS and PGMED were both contacted and informed that the Adriatic survey was now coordinated by WGBEAM.</p>
<p>Benchmark Workshop on Baltic Multispecies Assessments (WKBALT) 04 -08/02/ 2013</p>	<p>WK did not make an official request but used BITS 1991-2011 data product available online from DATRAS, but.</p>

Data call uploaded in DATRAS	Domain
Working Group on North-east Atlantic continental slope survey (WGNEACS) 18-20/06/2013	WGNEACS (previously called Planning Group on North-east Atlantic continental slope survey; PGNEACS) is the steering group for deep-water surveys in the Northeast Atlantic. One of the WG's ToRs was incorporating their survey into DATRAS which was set up for accepting Central Northeast Atlantic surveys, namely Scottish and Irish. At present data from the Irish Deep-water Survey are available for download from DATRAS. Scotland is expected to deliver their deep-water survey data by the end of this year.

Source: Feasibility study

Formats and content

The format used for the DATRAS database did not change over the past three year (the list of fields Structure can be found on DATRAS web page²⁷).

When delivering the data to the ICES Secretariat one file should only contain data from one Survey, Year, Quarter, Ship and gear.

There is a relation between the different type of records: HH (Record with detailed haul information) refers to several HL (Length frequency data) records collected during the same haul. The number and kind of species recorded must agree with the species recording code as specified in record TYPE HH.

Records of TYPE CA (Sex-maturity-age-length keys (SMALK's) for the ICES Subdivision) will also be recorded in the same file.

²⁷ https://datras.ices.dk/Data_products/ReportingFormat.aspx

Table 41. Nomenclature used in DATRAS

Coding		DCF compliance
Period (HH)	quarter	
Country(HH)	Country code on 3 characters/also mapped to ISO code	Ok
Ship(HH)	Country ship	Ok
gear(HH)	Trawl gear specification by identified survey vessel	
Statistic rectangle(HH)	ICES rectangle definition	Ok
SpecCode(HL/CA)	WORMS Identifier and max. recorded length of fish species(which is used in the DATRAS checking program)	
SpecVal	<ul style="list-style-type: none"> INVALID INFORMATION: meaning, it is not used in product calculation. A note should be given with the cause for the classification as invalid 1 = VALID INFORMATION: No per hour and total length, composition recorded; applies also when No per hour is zero. 4 = TOTAL NO PER HOUR ONLY Catch sampled for No per hour only; no length measurements. 	

Source: Feasibility study

Table 42. Structure of the file as loaded in DATSU is the same for all surveys data.

DATSU Exchange data (Product for all species)	Explanation on the various fields name can be found on http://www.ices.dk/datacentre/datsu/selrep.asp
Field name	Units/codes description
RecordType	http://vocab.ices.dk/?ref=191
Quarter	http://vocab.ices.dk/?ref=12
Country	http://vocab.ices.dk/?ref=4
Ship	http://vocab.ices.dk/?ref=3
Gear	http://vocab.ices.dk/?ref=2
SweepLngt	Metres
GearExp	http://vocab.ices.dk/?ref=97
DoorType	http://vocab.ices.dk/?ref=98
StNo	National code
HaulNo	Numeric value
Year	Calendar year, yyyy
Month	http://vocab.ices.dk/?ref=13
Day	Calendar day of the month, dd
TimeShot	GMT, hhmm
Stratum	http://vocab.ices.dk/?ref=99
HaulDur	Minutes
DayNight	http://vocab.ices.dk/?ref=8
ShootLat	<i>Degree.Decimal Degree of latitude</i>
ShootLong	<i>Degree.Decimal Degree of longitude</i>
HaulLat	<i>Degree.Decimal Degree of latitude</i>
HaulLong	<i>Degree.Decimal Degree of longitude</i>
StatRec	http://geo.ices.dk
Depth	Metres
HaulVal	http://vocab.ices.dk/?ref=1
HydroStNo	National code
StdSpecRecCode	http://vocab.ices.dk/?ref=88
BycSpecRecCode	http://vocab.ices.dk/?ref=89
DataType	http://vocab.ices.dk/?ref=9
Netopening	Metres
Rigging	http://vocab.ices.dk/?ref=181
Tickler	http://vocab.ices.dk/?ref=182
Distance	Metres
WarpLngt	Metres
Warpdia	Millimetres
WarpDen	Kg per linear meter
DoorSurface	Square metres
DoorWgt	Kilograms
DoorSpread	Metres
WingSpread	Metres
Buoyancy	Kilogram
KiteDim	Square metres
WgtGroundRope	Kilograms TowDir Degrees
GroundSpeed	Knots
SpeedWater	Knots

DATSU Exchange data (Product for all species)	Explanation on the various fields name can be found on http://www.ices.dk/datacentre/datsu/selrep.asp
SurCurDir	Degrees
SurCurSpeed	Metres/second
BotCurDir	Degrees
BotCurSpeed	Metres/second
WindDir	Degrees
WindSpeed	Metres/second
SwellDir	Degrees
SwellHeight	Metres
SurTemp	Celsius degrees
BotTemp	Celsius degrees
SurSal	Practical Salinity Units (PSU)
BotSal	Practical Salinity Units (PSU)
ThermoCline	http://vocab.ices.dk/?ref=112
ThClineDepth	Metres
SpecCodeType	http://vocab.ices.dk/?ref=96
SpecCode	http://datras.ices.dk/Data_products/qryspec.aspx
SpecVal	http://vocab.ices.dk/?ref=5
TotalNo	Number of fish
CatIdentifier	http://vocab.ices.dk/?ref=16
NoMeas	number of fish
SubFactor	factor of subsampling
SubWgt	Grams
CatCatchWgt	Grams
LngtCode	http://vocab.ices.dk/?ref=18
LngtClass	In mm or cm based on length code
HLNoAtLngt	Number of fish
AreaType	http://vocab.ices.dk/?ref=10
AreaCode	Check related references for AreaType and relevant dataset in the ICES vocabulary server
Sex	http://vocab.ices.dk/?ref=17
Maturity	http://vocab.ices.dk/?ref=128
PlusGr	http://vocab.ices.dk/?ref=14
Age	Years
NoAtALK	Number of fish
IndWgt	Grams

Source: ICES

3.2.3.b - InterCatch

Procedures

InterCatch DB is updated either annually or ad hoc, when data becomes available.

The data transmitters are informed by separate email and in the data call if changes in the structure are foreseen.

The data must be received by the Chair of the WG at the latest 2 weeks before the start of the meeting. (Things could change if RDB Fishframe data will directly feeding the InterCatch).

Table 43. Data calls uploaded in InterCatch

Group		ICES Comments
Herring Assessment Working Group for the Area South of 62°N	Fish stock assessment working group: 2012 data.(12 -21/03/2013)	Uses DATRAS NS-IBTS data products
Working Group on the Biology and Assessment of Deep-Sea Fisheries Resources	Fish stock assessment WG. 2012 data (14 -20/03/2013)	Uses DATRAS data products
Working Group on Assessment of New MoU Species	Fish stock assessment WG: 2012 data. (18-22/03/2013)	Uses DATRAS data products
Baltic Fisheries Assessment Working Group	Fish stock assessment WG: 2012 data.(10- 17/04/2013)	Uses DATRAS BITS data products
Arctic Fisheries Working Group	Fish stock assessment WG: 2012 data.(18-24/04/2013)	
Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak	Fish stock assessment WG: 2012 data and 2013 Q1 survey data. An official data call is planned for February on WGNSSK and WGMIX data(24- 30/04/2013)	One data call for the WGNSSK and the two WGMIXFISH. Uses also DATRAS IBTS, BTS data products
North Western Working Group	Fish stock assessment WG: 2012 data.(25/04 -02/05/2013)	
Working Group for the Celtic Seas Ecoregion	Fish stock assessment WG: 2012 data and 2013 Q1 surveys data. An official data call is planned February - March. (08-17/05/2013)	Uses DATRAS data products.
Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk and Megrim	Fish stock assessment WG: 2012 data and 2011 that was not available last year.(10-16/05/ 2013)	Official data call planned for 2014, through DCF national correspondence and ACOM members. Uses DATRAS data
Working Group on Mixed Fisheries Advice	Mix fisheries assessment WG. An official data call is planned for February.	One data call for the WGNSSK and the two WGMIXFISH

Group		ICES Comments
Working Group on Elasmobranch Fishes	Fish stock assessment WG: 2012 data.(17-21/06/2013)	Uses DATRAS data products
Working Group on Southern Horse Mackerel, Anchovy and Sardine	Fish stock assessment WG: 2013 / 2012 data and 2011 data that was not available last year.(21-26/06/2013)	
Working Group on Mixed Fisheries Advice	2012 data for North Sea and Celtic Sea and west of Scotland and Atlantic Iberian waters.(26-30/08/2013)	One data call for the WGNSSK and the two WGMIXFISH. Uses also DATRAS data products
Working Group on Widely Distributed Stocks	Fish stock assessment WG: 2012 data and 2011 that was not available last year.(27/08-02/09/ 2013)	Uses DATRAS data products
Joint NAFO/ICES Pandalus Working Group	Fish stock assessment WG: 2012 data.(12-19/09/09/2013)	

Source: ICES

The procedure to load data into InterCatch is as follows:

- Log in InterCatch
- Stock definition: the national data transmitter has to check the stock areas to have meaningful combination of species and area.
- Fleet definition: In cooperation with the stock coordinator, the transmitter defines the fleet/fisheries/métier for the national catches. For EU countries the fleet/fisheries/métier should be based on the métier in the DCF Métier (Nantes) Matrix.
- Data input :National catch data should be converted into the InterCatch Exchange Format:
 - A generic SQL Query Template is provided by ICES but it needs to be adapted to the national institute's databases by national programmers.
 - Another existing possibility is to fill in a Data Submission Workbook spreadsheet which can be downloaded from ICES and to use a conversion program which converts the catch data entered in the spreadsheet into the InterCatch format.
- Imported data can be viewed.

Formats and content

The format used for the InterCatch database did change slightly over the past three years. It is described in a manual.²⁸

Table 44. Nomenclature used: in InterCatch

Coding		DCF compliance
Season type	Month, quarter or year	
Country	ISO 2 letters country code	
Fleet	Stock coordinators define and create themselves inside InterCatch the needed fleets/fisheries/métiers. The definition should be in agreement with other stock coordinators, who refer to the same fleets/fisheries/métiers, and also in agreement with national data submitters.	The fleets/fisheries/métier defined should be based on the DCF Métier (Nantes) Matrix.
AreaType	Area top level , Divisions, Statistical rectangles, Sub-area or Sub-divisions.	ICES fishing area

Source: Feasibility study

Two types of data file can be uploaded: "commercial catch" and "survey and logbook" (Weight of the stock [WEST] and Maturity).

InterCatch data files are to be in .csv format. They contain header information-HI and species Information –SI records for commercial catch format, respectively LS and LD in the survey format.

²⁸ <http://info.ices.dk/datacentre/InterCatch/IC-ExchFormat1-0%20Doc1-8.pdf>

Figure 14. InterCatch format: Commercial catch format 29

InterCatch 1. Version (InterCatch)					Start/Order Field Name Width Mandatory Data Type Code List																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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Source: ICES web site.

²⁹ <http://info.ices.dk/datacentre/datsu/rptFmt.asp?Id=76>

Figure 15. InterCatch format: Survey and logbook format 30

Start/Order	Field Name	Width	Mandatory	Data Type	Code List
LS Header information					
1	RecordType	2	✓	char	
2	Country	3	✓	char	
3	Fleet	60	✓	char	IC_FleetName
4	Stock	10	✓	char	IC_Stock
5	Year	4	✓	char	IC_Year
6	SeasonType	10	✓	char	
7	Season	4	✓	char	
8	OriginOfData	1	✓	char	IC_DataType
9	UnitEffort	3	✓	char	
10	Effort	15	✓	decimal4	
11	UnitAgeOrLength	4	✓	char	IC_unitAgeLngt
12	CANUMtype	7	✓	char	IC_CANUMtype
13	unitMeanWeight	3		char	IC_unitWECA
LD Logbook/survey data					
1	RecordType	2	✓	char	
2	Country	3	✓	char	
3	Fleet	60	✓	char	
4	Stock	10	✓	char	
5	Year	4	✓	char	
6	SeasonType	10	✓	char	
7	Season	4	✓	char	
8	AgeLength	2	✓	int	
9	ICmaturity	4		decimal2	
10	MeanWeight	20		decimal12	
11	CPUE	10	✓	decimal1	

Source: ICES web site.

3.2.3.c - RDB-FishFrame

Procedures

One official data call through national DCF correspondent is made per year. The data call for RCM Baltic, RCM North Sea & Eastern Arctic and RCM North Atlantic where held from 1/06/2012 to 1/07/2012 and from 5/04/2013 to 15/07/2013. While in 2012 separate call was made of each RDB, in 2013 the three calls were integrated into one.

Text or XML data files are uploaded on the RDB-FishFrame using a secured http connection (https ASP.NET).

³⁰ <http://info.ices.dk/datacentre/datsu/rptFmt.asp?Id=77>

Data files are automatically converted to XML file for being checked. The upload procedure terminates if at least one error occurred during a specific check, it does not continue to the next check. User will receive an error report explaining the reason of the abortion of the loading.

The data providers are informed by separate email and in the data call if changes in the structure are foreseen. It was the case in 2013 where some mandatory fields have been made optional.

Formats and content

In 2013, the data should be uploaded using the FishFrame Exchange Format.

Table 45. Nomenclature used in RDB-FishFrame

Coding	Description	DCF compliance
Landing country	ISO 3166–1 alpha-3 codes the country where the vessel is landing and selling the catch	
Vessel flag country	ISO 3166–1 alpha-3 codes	
Area	Area level 3 (level 4 for Baltic, Mediterranean, and Black Seas) in the Data Collection Regulation	yes
Statistical rectangle	Area level 5 in the Data Collection Regulation). This is the ICES statistical rectangles (e.g. 41G9).	yes
Fishing activity category European level 5 category	(= métier). Level 5 as defined in a hierarchic structure in the Data Collection Regulation (EC, 2008a, 2008b).	yes
Fishing activity category European level 6	Code list Fishing activity category. Level 6 as defined in a hierarchic structure in the Data Collection Regulation (EC, 2008a, 2008b). Level 6 is further specified by the Regional Coordination Meetings (EC RCMs, Council Regulation [EC] No 1543/2000) or any later Authorized revision.	yes
Gear type	Code list	
Mesh size	Integer	
Species	The Scientific name in Latin (Genus species) is given. ICES would like to move to coding through WoRMS so it becomes consistent with DATRAS and EMD Bio when resources will be available	Not yet

Source: Feasibility study.

RDB-FishFrame only supports the very detailed document called Standard Data-Exchange Format³¹.

Files need to be named according to agreed convention to be accepted. The extension of the file defines the file format (CSV, XML or ZIP). CSV files may only use supported delimiters (either

³¹ Jansen, T. (Ed) 2009. Definition of Standard Data-Exchange Format for Sampling, Landings, and Effort Data from Commercial Fisheries. ICES Cooperative Research Report No. 296. 43pp

semicolon or comma). The decimal separator should be comma when delimiter is semicolon and a point when delimiter is a comma.

The data formats are given for three data types, each consisting of one or more record types.

All records are described in details in the Standard Data-Exchange Format documentation, including order, name, type, required information, basic checks, comments/information for each data type.

Table 46. Overview on descriptions in FishFrame standard Data Exchange Format documentation

Data type		Record type	Number of fields	Table ID in Documentation ³²
CS	TR	Trip record	1-17	2.3.1
	HH	Fishing station record	1-31	2.3.2
	SL	Species list record	1-18	2.3..3
	HL	Length record	1-18	2.3.4
	CA	Catch aged - SMAWL	1-32	2.3.5
CL	CL	Commercial fisheries Landing	1-23	2.3.6
CE	CE	Commercial fisheries effort	1-19	2.3.7

Source: ICES Cooperative Research Report No. 296

CS (Commercial samplings) data type consists of the following different record types:

- **TR** = trip: A commercial fishing trip that has been sampled on board or a sample from a fish market.
- **HH** = Haul Header: Detailed information about a fishing operation, e.g. a haul or a net set.
- **SL** = Species List: The sorting strata defined by species, etc.
- **HL** = Haul Length; Length frequency in the sub-sample of the stratum. One record represents one length class.
- **CA** = Catch Aged = SMAWL (Sex-Maturity-Age-Weight-Length): Sex-Maturity-Age-Weight distribution sampled representatively from the length groups. One record represents one fish.

CL (Commercial landing statistics) consisting of just one record type (unit: tonnes):

- **CL** = Commercial landing statistics (by MS, harbour, métier, species, month, ICES rectangle):

CE (Commercial effort statistics) consisting of just one record type (unit: KW-days):

- **CE** = Commercial effort statistics (by MS, métier, month, ICES rectangle).

³² Jansen, T. (Ed) 2009. Definition of Standard Data-Exchange Format for Sampling, Landings, and Effort Data from Commercial Fisheries. ICES Cooperative Research Report No. 296. 43pp

The data call includes all species caught and all species landed by all métiers (level 6).

Variables in the Commercial fisheries sampling (CS) data type:

- TR, Sampling_type, Landing_country, Vessel_flag_country, Year, Project, Trip_number, Vessel_length, Vessel_power, Vessel_size, Vessel_type, Harbour, No_SetsHauls_on_trip, Days_at_sea, Vessel_identifier, Sampling_country, Sampling_method
- HH, Sampling_type, Landing_country, Vessel_flag_country, Year, Project, Trip_number, Station_number, Fishing_validity, Aggregation_level, Catch_registration, Species_registration, Date, Time, Fishing_duration, Pos_Start_Lat_dec, Pos_Start_Lon_dec, Pos_Stop_Lat_dec, Pos_Stop_Lon_dec, Area, Statistical_rectangle, Sub_polygon, Main_fishing_depth, Main_water_depth, FAC_National, FAC_EC_lvl5, FAC_EC_lvl6, Mesh_size, Selection_device, Mesh_size_selection_device
- SL, Sampling_type, Landing_country, Vessel_flag_country, Year, Project, Trip_number, Station_number, Species, Sex, Catch_category, Landing_category, Comm_size_cat_scale, Comm_size_cat, Subsampling_category, Weight, Subsample_weight, Length_code
- HL, Sampling_type, Landing_country, Vessel_flag_country, Year, Project, Trip_number, Station_number, Species, Sex, Catch_category, Landing_category, Comm_size_cat_scale, Comm_size_cat, Subsampling_category, Sex, Length_class, Number_at_length
- CA, Sampling_type, Landing_country, Vessel_flag_country, Year, Project, Trip_number, Station_number, Quarter, Month, Species, Sex, Catch_category, Landing_category, Comm_size_cat_scale, Comm_size_cat, Stock, Area, Statistical_rectangle, Sub_polygon, Length_class, Age, Single_fish_number, Length_code, Aging_method, Age_plus_group, Otolith_weight, Otolith_side, Weight, Maturity_staging_method, Maturity_scale, Maturity_stage

Variables in the Commercial fisheries landings statistics (CL) data type:

- CL, Landing_country, Vessel_flag_country, Year, Quarter, Month, Area, Statistical_Rectangle, Sub_polygon, Species, Landing_category, Comm_size_cat_scale, Comm_size_cat, FAC_National, FAC_EC_lvl5, FAC_EC_lvl6, Harbour, Vessel_length_cat, Unallocated_catch_weigh, Area_misreported_Catch_weight, Official_Landings_weight, Landings_multiplier, Official_landings_value

Variables in the Commercial fisheries effort statistics (CE) data type:

- CE, Vessel_flag_country, Year, Quarter, Month, Area, Statistical_Rectangle, Sub_polygon, FAC_National, FAC_EC_lvl5, FAC_EC_lvl6, Harbour, Vessel_length_cat, Number_of_trips, Number_of_SetsHauls, FishingSoaking_time, kW_days, GT_days, Days_at_sea

1.2.4. Quality Control

ICES Secretariat interacts continuously with the scientific expert groups regarding needs, new methods, specifications, testing and comparison of system inputs and outputs. This close interaction is an essential part of making sure the systems support the scientific advice process.

Data Validation

To validate data, several steps may be taken to increase the correctness of the data. This can be done by either manual or automated checking procedures. The table below provides an overview which data domains in which ICES databases are quality checked.

Table 47. Overview of ICES quality checks on different domains in the DATRAS, InterCatch and RDB databases.

	Yes	No
Availability of data quality checks of primary³³ (detailed) data:		
- Biological stock related data?	RDB DATRAS	
- Biological métier related data?	RDB	
- Catch / landings data	RDB DATRAS	
- Effort data	RDB DATRAS	
- Environmental data	DATRAS	
Availability of data quality checks of aggregated data		
- Biological stock related data?	DATRAS InterCatch	
- Biological métier related data?	InterCatch	
- Catch / landings data	DATRAS InterCatch	
- Effort data	DATRAS InterCatch	
- Environmental data		X

Source: Feasibility study

³³ '**detailed data**' is based on primary data in a form which does not allow natural persons or legal entities to be identified directly or indirectly; '**primary data**' is associated with individual vessels, natural or legal persons or individual samples; (EC Reg. 199/2008)

3.2.4.a - DATRAS

Data validation occurs for DATRAS data for primary data and aggregated data for trawl survey data. Primary environmental data (CTD conductivity –temperature- density data) are also quality checked. Biological stock-related primary data are checked manually or software based.

Table 48. DATRAS: Data validation methods for biological – stock-related data

	Biological – stock related primary data				Biological – stock related aggregated data		
	Not relevant	No	Manual check	Software check	Not relevant	Manual check	Software check
• Availability			X			X	X
• Accessibility				X			X
• Missing values			X	X		X	X
• Duplicated records				X		X	X
• Timeliness			X	X		X	X
• Coding			X	X			X
• Std. deviation				X			X
• Coefficient of variation					X		
• Sample size				X		X	X
• Sampling rate				X	X		
• Response rate	X				X		
• Coverage rate			X			X	X
• Typing errors			X	X	X		
• Arithmetic checks				X			X
• Logical checks				X			X
• Range/ outliers			X	X		X	
o cross section				X		X	
o time series		X				X	
• Other sources			X			X	

Source: Feasibility study

Catch/landing primary and aggregated data are checked manually or software based (sometimes both methods).

Table 49. DATRAS: Data validation methods for primary and aggregated catch/landing data.

	Catch / landings primary				Catch / landings aggregated		
	Not relevant	No	Manual check	Software check	Not relevant	Manual check	Software check
• Availability			X			X	X
• Accessibility			X	X			X
• Missing values			X	X		X	X
• Duplicated records				X		X	X
• Timeliness			X	X		X	X
• Coding			X	X			X
• Std. deviation				X			X
• Coefficient of variation				X	X		
• Sample size				X		X	X
• Sampling rate				X	X		
• Response rate	X				X		
• Coverage rate			X			X	X
• Typing errors			X	X	X		
• Arithmetic checks				X			X
• Logical checks				X			X
• Range/ outliers			X	X		X	
o cross section				X		X	
o time series		X				X	
• Other sources			X			X	

Source: Feasibility study

Effort primary data and aggregated data are checked manually or software based. Sometimes are both methods applied.

Table 50. DATRAS: Data validation methods for effort data

	Effort primary				Effort aggregated		
	Not relevant	No	Manu-al check	Soft-ware check	Not relevant	Manu-al check	Soft-ware check
• Availability			X			X	X
• Accessibility			X	X			X
• Missing values			X	X		X	X
• Duplicated records				X		X	X
• Timeliness			X	X		X	X
• Coding			X	X			X
• Std. deviation				X			X
• Coefficient of variation				X	X		
• Sample size				X		X	X
• Sampling rate				X	X		
• Response rate	X				X		
• Coverage rate			X			X	X
• Typing errors			X	X	X		
• Arithmetic checks				X			X
• Logical checks				X			X
• Range/ outliers			X	X		X	
o cross section				X		X	
o time series		X				X	
• Other sources			X			X	

Source: Feasibility study

Environmental primary data (not DCF environmental indicators) are manually checked for typing errors and software checked for missing values, duplicated records or coding and arithmetic checks.

The working group users should be able to make a general evaluation of the quality of the SMALK data and this should be done by creating plots of ALK (Age-Length Key) and MALK (Maturity – Age-Length Key) with all data included in a survey and an area.

WG user can:

- analyse outliers in combined data for a survey and compare to previously submitted data;
- download meta data to identify how much data are in the database and the status of the data;
- run inter-survey comparisons.

DATRAS is able to run checks on:

- Weight–Length CA record check: according to the relationship between weight and length, which can be described by the regression model: $W_j = a L_j^b \varepsilon_j$, where W_j is the weight and L_j is the length of the individual j , and ε_j represents the error term.
- Maturity–length check and age-length check: The relationships between maturity and length and age and length in the CA-records are not part of the standard checks done when loading the data to DATRAS but need to be developed.
- Size range check: warning if a measurement is outside of the distribution area or length data that are out of the size range of a species. DATSU contains a list of fish species that occur in each surveyed area separately.

3.2.4.b - InterCatch

For aggregated biological métier related data, missing values, duplications, timeliness, coding and typing errors are checked manually or by software. The same checks are performed for biological stock related data, and in addition range/outlier, logical and arithmetic checks.

Table 51. InterCatch: Data validation methods / quality checks for biological métier and stock related data.

	Biological – métier related data			Biological – stock related data		
	No	Manual check	Software check	No	Manual check	Software check
• Availability	X			X		
• Accessibility	X			X		
• Missing values			X			X
• Duplicated records			X			X
• Timeliness		X			X	
• Coding			X			X
• Std. deviation	X			X		
• Coefficient of variation	X			X		
• Sample size	X			X		
• Sampling rate	X			X		
• Response rate	X			X		
• Coverage rate	X			X		
• Typing errors			X			X
• Arithmetic checks	X					X
• Logical checks	X					X
• Range/ outliers	X					X
o cross section	X					X
o time series	X			X		
• Other sources	X			X		

Source: Feasibility study

Table 52. InterCatch: Data validation methods / quality checks for catch /landings and effort data.

	Catch / landings			Effort			
	No	Manual check	Software check	Not relevant	No	Manual check	Software check
• Availability	X			X			
• Accessibility	X			X			
• Missing values			X		X		
• Duplicated records			X				X
• Timeliness		X				X	
• Coding			X				X
• Std. deviation	X				X		
• Coefficient of variation	X				X		
• Sample size	X				X		
• Sampling rate	X				X		
• Response rate	X				X		
• Coverage rate	X				X		
• Typing errors			X		X		
• Arithmetic checks			X		X		
• Logical checks			X		X		
• Range/outliers			X		X		
o cross section			X		X		
o time series		X			X		
• Other sources					X		

Source: Feasibility study

For aggregated catch/landings data, missing values, duplication, timeliness or coding are checked manually or by software. Typing errors, arithmetic, logical, range/outlier checks and cross section are checked by software and time series are checked manually.

For aggregated effort data, duplication and coding are by software, timeliness is checked manually.

An “Overlap check” is implemented in InterCatch. This considers area, temporal, catch category and reporting category and specifications. The purpose with the check is to prevent the same catch/landing/discards to be imported twice at a different area or temporal level. It is foreseen to rewrite this checking program to make imports more flexible (e.g. different area levels for different quarters) and make sure fewer errors are done during import and during finding and correction of potential errors or adding of additional checks. In addition, ICES considered the program as it is written now is too complicated.

In the user manual, it is indicated that the InterCatch proposes an advanced validation tool which is not needed in the process of producing stock data for the assessment working groups. But it is a useful tool to check if any values are out of expected range. The advanced validation is a complicated tool which the stock coordinator and data submitter need to spend some time on to be able to use it. Checks can be customised and saved

3.2.4.c - RDB FishFrame

Data validation occurs for RDB-FishFrame for detailed biological stock-related, biological métier-related, catch/landings and effort data.

For detailed biological métier-related data, missing values, duplication, coding and typing errors are checked by software. Sampling size, rate, response rate, timeliness and coverage rate are checked manually. The same checks are conducted for stock-related data.

Catch/landing data are checked manually for availability, accessibility and timeliness. Software checks for missing values, duplication and coding. Sampling size, rate response rate and coverage rate are checked manually, whereas arithmetic, logical checks, range/outlier and cross sections are software based.

Table 53. RDB-FishFrame: Data validation methods / quality checks for biological métier- , stock-related and catch/landing data.

	Biological – métier related data			Biological – stock related data			Catch / landing data		
	No	Manu- al check	Soft- ware check	No	Manu- al check	Soft- ware check	No	Manu- al check	Soft- ware check
• Availability	X			X				X	
• Accessibility	X			X				X	
• Missing values			X			X			X
• Duplicated records			X			X			X
• Timeliness		X			X			X	
• Coding			X			X			X
• Std. deviation	X			X			X		
• Coefficient of variation	X			X			X		
• Sample size		X			X			X	
• Sampling rate		X			X			X	
• Response rate		X			X			X	
• Coverage rate		X			X			X	
• Typing errors			X			X	X		
• Arithmetic checks	X			X					X
• Logical checks	X			X					X
• Range/ outliers	X			X					X
o cross section	X			X					X
o time series	X			X			X		
• Other sources	X			X			X		

Source: Feasibility study

For effort data the general occurrence of quality tests has been mentioned in the study survey questionnaire, but this was not specified in detail further.

During the upload process, the following checks are performed

- All non xml files uploaded in the RDB-FishFrame are converted to xml for further format validation and data checking which are detailed below.
- Structural, data type , patterns and code validation can be performed.
- Range/enumeration checks: each parameter does not exceed defined ranges for numeric values or is included in a close list of accepted values.
- Duplicate key validation: no records exist as a duplicate to the other.

- Dependency checks are checks where two or more parameters are compared for acceptable relationships. Checks can be managed in a “Data Checker Construction Tool”.
- Check for existence of data conflict. If some data having the same key variables already exist in the database, then the uploaded is requested to indicate if those are to be overwritten by the new data.

Storage of quality indicators

During the upload process, the following checks are performed:

- All non xml files uploaded in the RDB-FishFrame are converted to xml for further format validation and data checking which are detailed below.
- Structural, data type, patterns and code validation can be performed.
- Range/enumeration checks: each parameter does not exceed defined ranges for numeric values or is included in a close list of accepted values.
- Duplicate key validation: no records exist as a duplicate to the other.
- Dependency checks are checks where two or more parameters are compared for acceptable relationships. Checks can be managed in a “Data Checker Construction Tool”.
- Check for existence of data conflict. If some data having the same key variables already exist in the database, then the uploaded is requested to indicate if those are to be overwritten by the new data.

Storage of quality indicators

The quality indicators of most of the domains covering the detailed data as well as the aggregated data of all three ICES databases are stored in the ICES Quality Control (QC) data base. This data base is offline.

In addition, quality-related documentation is available for the DATRAS database³⁴. Documentation of quality in DATRAS is prepared by ICES Data Centre and survey group team. DATRAS workshops³⁵ are organised periodically for improvement of quality and the system. Information can be found on survey working groups’ annual reports under data quality section.

Meta data checks: Possibility to view and download meta data in order to identify how much data are in the database and the status of the data. It can be done by all DATRAS users.

Quality Assurance by survey (inter-survey comparisons): DATRAS provide the survey working groups with a standardized output of the data that was collected during all previous surveys. It

³⁴ (1) <http://info.ices.dk/datacentre/datsu/selrep.asp>

(2) https://datras.ices.dk/Data_products/ReportingFormat.aspx

(3) <https://datras.ices.dk/Documents/FAQ/FAQ.aspx>

(4) <https://datras.ices.dk/Data%20submission/How%20to%20upload%20data%20into%20DATRAS.pdf>

(5) ICES Quality Control (QC) Database (offline)

³⁵ <http://www.ices.dk/community/groups/Pages/WKDATR.aspx>

shows the annual output files at a survey-level or appropriate area (not by country or vessel) and to include:

- Species list, including all species caught with the total catch number, Lmin, Lmax the number of positive hauls, and the total number of hauls.
- LF-graphs of all species caught.
- Distribution maps with catch numbers of all species caught.
- Cross-table showing catches numbers of all species caught vs. all countries/vessels, in order to compare species identification among countries/vessels. Countries/vessels with an overlap in survey area are marked.

The generated output files should be compared with the average outcome of the past 5 years, which is also provided by DATRAS.

1.2.5. Dissemination

Confidentiality of data

DATRAS:

The general ICES data policy states that all data are publicly available and the data available in DATRAS are then made public at exchange primary data level.

InterCatch:

The data in InterCatch are treated as restricted data all the way, with access for the providing country and the specific assessment WG. Several roles are ensuring this.

RDB FishFrame:

The data is treated as restricted data all the way, with access for the providing country and the specific assessment WG and RCM. Several roles are ensuring this.

Concerning access restrictions in general, three data user groups need to be differentiated:

1. The internal staff,
2. Special user groups like scientific working groups (WG) involved in policy advice (like ICES HAWG, WGBFAS, WGNSSK, IBTSWG, WBBIFS, WGBEAM, WGNEW, WGCSE, WGEF), DG MARE and
3. The general public as e.g. marine biologists, researchers, students.

Restricted access (WGs + Internal staff), including confidentiality

DATRAS:

- The access to DATRAS is fully open (no restriction) through the web portal <http://DATRAS.ICES.dk>
- The upload of data requires login / password.
- DATRAS has an active dissemination policy for special WGs and the general public.

InterCatch:

- The access to InterCatch is through the web portal: <http://intercatch.ices.dk/Login.aspx>
- The upload and access of data requires login / password.
- Following access restrictions are active: Full access to all data to internal staff and to the user groups but **not** to the general public.
- Login / passwords are required for user groups but not for internal staff.
- Even within the WGs different levels of access are provided to the WG coordinator and members. The stock coordinators have special access rights which enable them to perform calculation within the InterCatch database.
- Internal staff is unlimited in data exportation, WGs members have export limits.
- InterCatch has no active dissemination policy.
- Some of the data are confidential and cannot be disseminated. The quarterly métier strata data, which are not published through stock assessment reports, are accessible only to the providing country and the specific assessment WG.
- Extraction services: Standard output files can be generated for WG members. Specific request can be made to the ICES database manager by filling in a form which is submitted by e-mail. This possibility is open for WG members only and not for the general public.
- The public can request data, which have been published by the expert group reports. These data can also be requested electronically.

RDB FishFrame:

- The access to RDB FishFrame is through the web portal: <https://www.rdb-fishframe.org>.
- The upload and access requires login / password.
- Following access restrictions are active: Full access to all data to internal staff and to the RCM but not to the general public. Access to the aggregated data for other WGs.
- For RDB FishFrame sections login / passwords are required for user groups but not for internal staff.
- Even within the WGs different levels of access are provided to different types of users.
- Internal staff is unlimited in data exportation, WGs members have export limits.
- RDB FishFrame has no active dissemination policy.



- **Extraction services:** Standard output files can be generated for WG members. Specific request can be made to the ICES database manager by filling in a form and send it to him by e-mail. This possibility is open for WG members only and not for the general public.

Public Access

DATRAS:

Aggregated data and raw data are freely available to download from the data products page on DATRAS³⁶. The user can download survey products and can choose from a scroll menu data product, survey, quarter, year and ship. The user has to notice and accept relevant notes on ICES data policy to receive the download.

InterCatch:

InterCatch data is not accessible to public.

Data published in the expert group reports can be requested as electronic data.

RDB-FishFrame:

RDB-FishFrame data is not accessible to public.

Technical functionalities

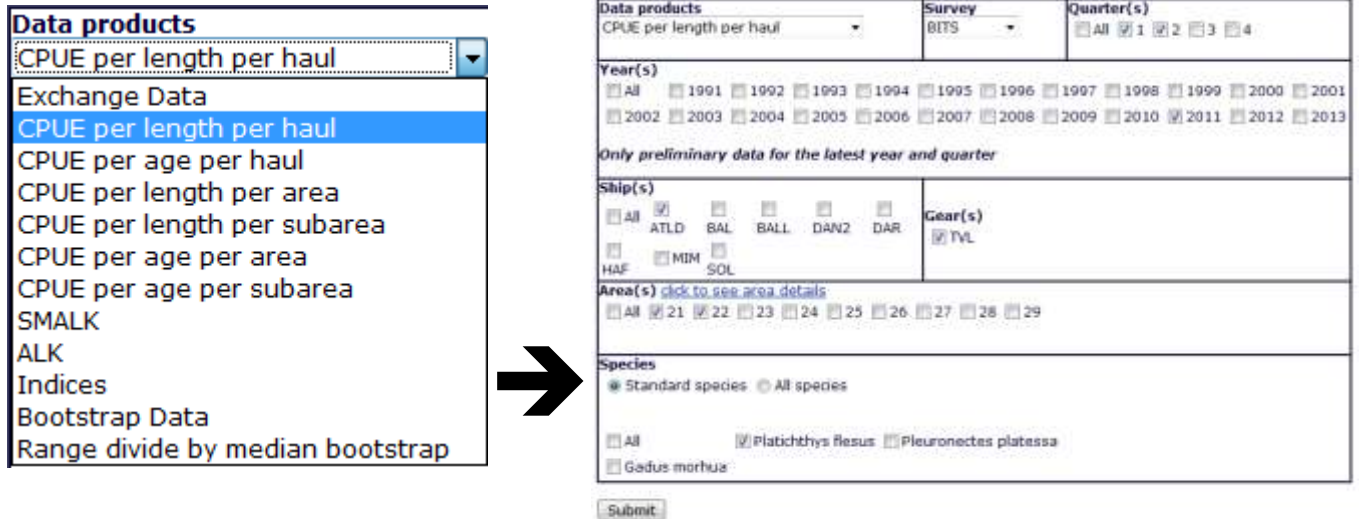
DATRAS:

DATRAS is accessible using a standard web browser.

Several products (view – described in DATRAS aggregation level chapter) are made available to users.

³⁶ https://DATRAS.ICES.dk/Data_products/Download/Download_Data_public.aspx.

Figure 16. DATRAS interface screen shots



Source : https://datras.ices.dk/Data_products/Download/Download_Data_public.aspx

An automatic message referencing to the ICES data policy has to be accepted before further access to the download is activated. A data “health warning” highlights important information about data quality, gear differentiation, catch ability, species identification skills, spatial and temporal resolution of the data and the notice that the users of the data are urged to caution and if in doubt should contact the relevant experts from ICES or the specific working groups.

The data will be exported into a csv format stored in a zip file containing also a data product guide and an acknowledgment text file that describes any known issues in the dataset.

InterCatch and RDB-FishFrame:

Data from the two systems are not publicly available. The data can be extracted by authorised user through dynamic tables / filters in Excel/CSV/TXT formats. RDB-FishFrame allows also extraction in XML.

1.2.6. Institutional Considerations

Legal

ICES was established in 1902 as an intergovernmental organization. The ICES Convention (1964)³⁷ and the Copenhagen Declaration (2002)³⁸, signed by the Contracting Parties (Member States of ICES), outline the fundamental purposes of ICES. The ICES Convention states that the purpose of ICES is:

- “To promote and encourage research and investigations for the study of the sea particularly those related to the living resources thereof;
- To draw up programmes required for this purpose and to organise, in agreement with the Contracting Parties, such research and investigation as may appear necessary;
- To publish or otherwise disseminate the results of research and investigations carried out under its auspices or to encourage the publication thereof.”

In the Copenhagen Declaration, the Contracting Parties agreed to:

- “Reaffirm their commitment to maintain ICES as a strong and independent scientific organisation in order to improve its capacity to give unbiased, sound, reliable, and credible scientific advice on human activities affecting and affected by, marine ecosystems;
- Endorse the ICES Strategic Plan as a basis for future ICES scientific and advisory work;
- Stress the need for ICES to develop and promote science-based knowledge of living marine resources and marine ecosystems
- Stress the need for ICES to strengthen working relationships with users of scientific information on living marine resources and marine ecosystems, including fishery management organisations and environmental commissions, and with stakeholders that are affected by or have an interest in, ICES work, thus requiring that ICES:
 - apply a quality assurance scheme for its advisory function;
 - adopt procedures to ensure the full consideration of data from a wide range of stakeholders;
 - be flexible and timely in providing scientific advice to meet the needs of decision-makers responsible for the stewardship of living marine resources and marine ecosystems without compromising the quality or reliability of the advice;
 - ensure that ecosystem considerations, including the effects of human activities and climatic and oceanographic conditions, are taken into account;
 - frame advice in relation to fisheries management, giving full consideration to the ecosystem context.”

³⁷ http://www.ices.dk/explore-us/who-we-are/Documents/ICES_Convention_1964.pdf

³⁸ http://www.ices.dk/explore-us/who-we-are/Documents/CPH_declaration_2002.pdf

- ICES and the European Union, represented by the European Commission, have a formal agreement in a form of a Memorandum of Understanding (MoU³⁹) forming the basis for provision of advisory deliverables to the EU from ICES.

Relation to EU legislation:

- According to ICES MoU with EC (Page 2, 2.): ”the advisory deliverables are science based products provided by ICES in support to the implementation of policies adopted by the EU and its member States with respect to management of activities that affect marine ecosystems. Advisory deliverables are, in particular, sought in respect of the Implementation Plan of the World Summit on Sustainable Development (Johannesburg, 2002) and the implementation of the Common Fishery Policy, the Water Framework Directive, the Habitat Directive, the Marine Strategy Framework Directive, the Integrated Maritime Policy, the Framework Programmes for Research and Technology Development, and in relation to data and marine research needs to support these policies. The advisory deliverables include “advice and associated supports relating to the Data Collection Framework; including development, updating and maintenance of data bases regarding surveys (DATRAS) and fishery data, recurrent review of data delivered for ICES` advice and on standards, manuals and coordination as well as shared points for the Regional Coordination Meetings.”⁴⁰ “The EU will arrange – through Member States or directly- for any data collected both through the Data Collection Regulation and the Data Collection Framework and legally disposable for scientific analysis to be available to ICES.”⁴¹
- “The EU will assist ICES in getting access to any other data which has been collected under legislation of the European Union or is collected with the support of funding of the European Union while respecting legal status regarding the distribution of this information (i.e. confidentiality or public availability such as pertaining to environmental information)”⁴²

Administrative

Guarantee of confidentiality:

- ICES statutes contain provisions in relation to confidentiality of the data in their databases. ICES has an ‘open’ data policy⁴³.
- The policy specifically excludes the commercial catch databases (InterCatch and RDB-FishFrame) as these are subject to the provisions of the DCF regulations. The use of login and the use of multiple roles impose in terms of access (upload), transmission, storage and dissemination of data the three different databases at ICES.

³⁹ http://www.ices.dk/explore-us/who-we-are/Documents/CPH_declaration_2002.pdf

⁴⁰ http://www.ices.dk/community/advisory-process/Documents/2013_EC_ICES_MoU_WEB.pdf; Page 3 iii

⁴¹ http://www.ices.dk/community/advisory-process/Documents/2013_EC_ICES_MoU_WEB.pdf; Page 10 Annex 1

⁴² http://www.ices.dk/community/advisory-process/Documents/2013_EC_ICES_MoU_WEB.pdf; Page 10

⁴³ <http://ICES.dk/marine-data/guidelines-and-policy/Pages/ICES-data-policy.aspx>

- For DATRAS: All data is publicly available, only the upload is protected by a login.
- For InterCatch the data is treated as restricted data all the way through, with access for the providing country and the specific assessment WG. Several roles are ensuring this.

Adaptation of statutes for confidentiality:

For ICES no adaptations in the status of confidentiality are needed in order to assure confidentiality of any new data which may be brought under its responsibility.

Financial

Funding

ICES is financed through contribution of contracting parties. According to ICES (MoU) the EU contributes to the budget of ICES for recurring advisory deliverables an annual budget of 1,400,000€. For non-recurring advisory deliverables provided (MoU, Annexes I & IIB) the EU reimburses the expenses which are directly connected with execution of the tasks on production of original supporting documents, associated supports including receipts and used tickets.

Staff and Budget for DB development

- ICES has own staff for database development but also relies on the whole ICES community for new changes, specifications, function testing and output comparisons. The total costs for IT maintenance amounted to about 450,000€ in 2012. ICES Data Centre employs 11 people working with information systems/databases. For the DATRAS, InterCatch and RDB databases there are 4 full-time staff: one Project Manager, two Data System Analyst, and one Data Officer. In addition there is a team of 4 IT staff that support the infrastructure.

1.3. JRC

1.3.1. Summary

- JRC collects data on behalf of DG MARE, processes them and provides them to the STECF Expert Working Groups (EWG) as a basis for their scientific advice. As a collateral outcome of this process, the data are also made public in the SAIKU database after they have being validated by the STECF Expert Working Groups.
- Data collection is performed at a very detail level for the firms where fish processing industry is the main activity. For the ones where it constitutes the second activity, only the turnover part is requested. For aquaculture, only the enterprises where aquaculture is the main activity are collected in accordance with the Commission Decision 2010/93/EU for the Aquaculture.

- Apart from economic data and effort data, JRC also collects biological data for the Mediterranean and Black Sea area including MEDITS survey for 7 countries (Cyprus, Spain, France, Greece, Italy, Malta, Slovenia, Bulgaria, Romania)
- JRC implemented a tool to allow MS checking the data directly at the source (DV tool) before data are uploaded at JRC, but it is not applied on aquaculture and fish processing industry data calls.
- The data collection template is clearly described but not all templates are built on the same model (i.e. embedded code checks vs. list of available codes without data entry checks...).
- A prototype facility has been developed by JRC in order to allow DG Mare officers monitoring of incoming data during the upload period.
- JRC creates one production database per year and per call.
- JRC has internal infrastructure and the databases are maintained by JRC directly by IT staff recruited on a contract basis. JRC databases are not connected to other databases inside or outside JRC.
- There is no real link between the production and the SAIKU dissemination database as the data in dissemination database are those validated by the STECF which could include data corrections agreed in the meeting. Legally JRC cannot disseminate directly DCF data, that's why the dissemination is based on the data validated by the STECF made publicly available.
- The online dissemination is divided into two parts one for disseminating data on effort, landing, discards and fleet economic data and one for presenting a limited set of economic indicators concerning EU fishing fleet, Aquaculture and processing Industry calculated as context indicators for operational programmes under the new EMFF. The interface is user-friendly and self explanatory. Nevertheless, it is to be noted that the Mediterranean and Black Sea biological data and recreational fisheries data collected are not disseminated on JRC web site.
- The data dissemination policy consists of giving users the opportunity to explore the aggregated data published in STECF reports. The tools implemented could go into that direction but it is to be noted that beside the SAIKU database/Fishreg web site, the data validated by the STECF are also disseminated on the STECF web site in Excel files. Apart from the level of details disseminated which is sometimes different between the two sites, the data are not published at the same time.

1.3.2. Data storage and access

3.3.2.a. JRC production database

Overview

The JRC collects and maintains fisheries management data transmitted by EU Member States. The resulting datasets are assessed by teams of independent experts participating in working groups convened by the Scientific, Technical and Economic Committee for Fisheries (STECF). Great part of JRC’s resources is used for data processing and for providing data to the STECF EWG. The data validated by the STECF are made available to the public in the STECF reports (pdf) and corresponding Excel files and in a dissemination database called SAIKU, the dissemination in the SAIKU database being not the main objective of the JRC.

There is one production database per data call: one for biological data in Mediterranean and Black Sea, one on effort regime and three for economic data. Extractions from the production databases are used at the STECF meetings for the validation of the data.

Table 54. Databases – names and domains

Name of the database	Domain covered by the database	Production / dissemination DB
SAIKU	Dissemination database containing aggregated transversal, fleet economic data , biological data (effort regime) , older DCR data from 2002-2007 and economic indicators on fleet, aquaculture and fish processing industry accessible via https://fishreg.jrc.ec.europa.eu/web/datadissemination	Dissemination
dc-economic	Fleet economic data call for a given year	Production
dc-aquaculture	Aquaculture data call for a given year	Production
dc-proind	Processing industry data call for a given year	Production
dc-effort	Effort regime data call for a given year	Production
dc-med	Biological data from the Mediterranean and Black Sea data call for a given year	Production

Source: Feasibility study survey

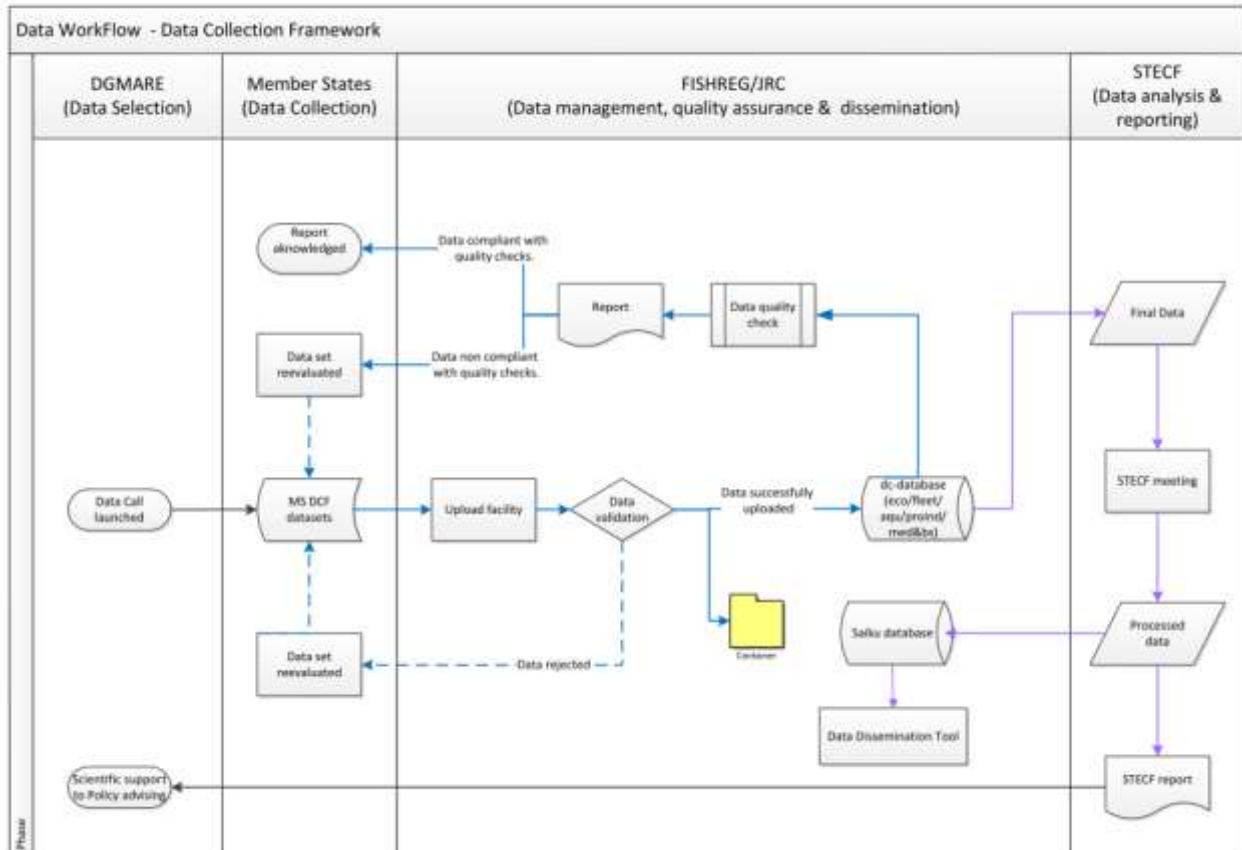
The systems are hosted at JRC and the management of the databases is outsourced to an external system administrator. Databases are developed by two IT consultants. These are recruited on a contract basis.

No documentation on the production databases exists.

No information is provided directly to other institutions and the databases are fully independent and not connected with others inside or outside the JRC.

The general process for the production of JRC database is described in the following data flow.

Figure 17. JRC data flow (source JRC)



Source: JRC

The productions systems at JRC

Connection to the JRC production database

The production databases are accessible through the intranet only.

Internal staff can log in the production databases. In addition to the database administrator, there are different levels of permission. A limited number of internal staff can see the data (typically, those working within the data call process), then usually the person in charge of the data call has permission to see and change data.

System and database structure of the JRC productions database

The production databases are built in Postgresql and their management is performed with the embedded Postgresql graphical client « pgAdmin III » allowing performing SQL queries and the most current administrative tasks. R programs are also used for checking the data stored in the Postgresql database. No specific user interface was then developed for the production databases.

Table 55. JRC production database technical and functional issues analysis

Technical requirements	
Technical trends	Postgresql version 9.2.4 open source database, R + knitr+Latex and sqldf Excel and VBA for the data collection templates
Connection	Only LAN connection
Cost : software purchase/ maintenance fees	Free solution
Interoperability with other system and web services	Not relevant, only intranet No connections between the databases inside and outside JRC
Conformity to standard	JRC is using DCF definitions
Referential	FAO standard for species No specified connection/module for the management of referential common to all database
Reusability	Databases are independent Reproducible quality reports are generated by using R + knitr+Latex and sqldf to source the PostgreSQL database
Updatability/generic : resources needed, customisation of the tests	Not for the database R modules could be adapted for tests
Data security and access level(due to confidential data)	Security: integrity and availability is ensured through regular backups and failure recovery procedure: master server could be substituted by a slave server copy if needed and backups are regularly performed and saved in a secured place. Access is limited to the intranet and by logging in.
Follow up of user requests	Not relevant , only accessible via LAN/intranet
Functional requirements	
Meta data management	None
Upload facilities	Internet data upload module connected to the production database.
Automated validation	DV tool embedded in the questionnaire before upload and checks performed during upload and after.
User-friendliness- Easiness to use	Postgresql graphical client “pgAdmin III” is designed for developer. No specific user interface for the extraction/manipulation of the data but the production database is only for internal use.
Availability of technical documentation	No documentation available.
User support	External IT consultant
Resource needed for the maintenance	External IT consultant

Source: Feasibility study.

Aggregation level (variables and dimensions)

Data calls are made for DG MARE in the context of the DCF only and are fully DCF compliant.

No specific aggregation/estimates are performed in the production databases. The information detail level is described in the data upload chapter.

Data processing and estimations

The following steps can be identified in the data processing:

- DG MARE decides on the data calls needed and formally launches them. Technical implementation is delegated to JRC.
- JRC formalizes the call: preparation of the templates and DV tool in accordance to the data call requirements, prepares the Postgresql ad hoc database as well as the interface for uploading the data on JRC web site.
- Official letters on the data-call site <http://datacollection.jrc.ec.europa.eu/data-calls> are formally written and signed by DG MARE.
- JRC informs the MS about the call two months before it is launched.
- JRC opens the call on the website and launches. MS have one month to provide the data.
- MS upload data –JRC as well as DG MARE can follow the data transmission using the data transmission tool.
- Automated checks are performed when MS upload the data. In addition to the offline data checks (DV tool) there are online data checks through dedicated Java portlets.
- Coverage reports are mainly focusing on availability of the data and timeliness. They are issued normally one month after the STECF meeting to also include considerations on data quality by the experts.
- Data extracted from the production database are validated by the STECF working groups and uploaded in the SAIKU dissemination database accessible through the web.
- No revision of the data is made after that stage. However, data may be reviewed by the MS and the corrected data is submitted in the following year.

3.3.2.b. The SAIKU dissemination database

Connection to SAIKU

The SAIKU database is accessible at <https://fishreg.jrc.ec.europa.eu/web/datadissemination/>. It provides public access to some of the data calls information: data are made accessible through two tabs: “data” and “economic indicators” (see chapter data upload for more details).

System and database structure of SAIKU

The SAIKU database was developed internally.

- Backend: Mondrian is an Online Analytical Processing engine (OLAP) allows analysing large quantities of data in real-time. OLAP executing queries reading data from the Postgresql database, and presenting the results in a multidimensional format via a Java API.
- The front end is made with JQuery and BackBone to organize the web application.

No Web services or catalogue of data are implemented.

Table 56. SAIKU technical and functional issues analysis

Technical requirements	
Technical trends	Postgresql open source database, OLAP , JQuery /backbone
Connection	Internet
Cost : software purchase/ maintenance fees	Free solution
Interoperability with other system and web services	None
Referential	DCF nomenclature but no specified module for the management of referential common to all database
Reusability	Not relevant
Updatability/generic : resources needed, customisation of the tests	Use of standard library jquery
Data security and Access level(due to confidential data)	No confidential data. The web server is regularly backed up The economic indicators interface was offline between 25/10 and 04/11 for maintenance
Follow up of user requests	No user request management
Functional requirements	
Meta data management	There is a link to STECF report corresponding with the data to be extracted and explaining the source of the data. Metadata is provided for the entire datasets. There are no flags associated to single values.
Upload	Data are uploaded by JRC staff
Automated validation	None
User-friendliness-	The use of the tool is self explanatory
Availability of technical documentation	No
User support	External IT consultant
Resource needed for the maintenance	External IT consultant

Source: feasibility study.

Aggregation level (variables and dimensions)

The aggregation level is given in chapter data upload as it corresponds to the level of the disseminated data.

Data processing and estimations

The data are processed in the JRC's production databases, extracted from the production databases to be analysed in STECF working groups. The analysed /corrected data are uploaded manually by the JRC staff in SAIKU after the STECF meeting.

1.3.3. Data Upload

3.3.3.a. JRC's production systems

Procedures

The JRC production databases are updated on **an annual basis** except for fish processing where data calls are held on a bi-annual basis.

JRC is mandated to collect data on behalf of DG MARE. The deadline of the data call is one month after the day of the launching of the data calls. This one month period is set out in the legal framework.

The data call web page on JRC web site (<http://datacollection.jrc.ec.europa.eu/web/dcf/upload>) provides access to the data uploading procedure. Access is restricted to the 22 Member States (MS-22* (non land-locked states): Belgium, Bulgaria, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovenia, Spain, Sweden, The Netherlands, United Kingdom) concerned by the DCF. Each Member State has a different 'user name' and 'password'. Uploaded data can consist in appending or simply replacing already loaded data.

A prototype facility has been developed by JRC in order to allow DG MARE officers monitoring of incoming data during the upload period.

A JRC data validation tool is provided to MS for some of the data calls namely the fleet, Mediterranean and Black Sea and effort regime (see data quality section). The data validation tool should help correcting/validating the data directly at the source before uploading them at JRC.

Table 57. The JRC data calls

Name of the JRC call / relevant MS	Domain/template	Time period	regulation	Year / Month of launch	Year / Month of deadline
Data related to the Annual Economic Report EU fishing fleet MS-22	Economic data collected for three domains through 9 templates. Economic (5 templates) -fish enterprise: -employment -income -expenditure -capital and investment Transversal(3 templates) -capacity -effort -landing Recreational fisheries(1 template) -catches	Year	No 199/2008,	2011/February 2012/February 4/02/2013 -	2011/March 2012/March 4/03/ 2013
Data related to the economic performance of aquaculture sector MS-22	Aquaculture domain 2 templates aqua_economic: Requirements for 2008-2009-2010-2011 aqua_production : Turnover by species	Year	No 199/2008,	2011/May 2012/May 2013/May (13th May 2013 for one month)	2011/June 2012/June 13/06/2013
Data on the fish processing sector (bi annual) MS-22	Fish processing domain Dcf_proind (general): not main activity Dcf_prodin_ma(detailed): main activity	Year	No 199/2008,	2011/July 30/08/2013	2011/August 30/09/2013
Mediterranean (MED) & Black Sea (BS) - "SGMed" For Cyprus, Spain, France, Greece, Italy, Malta, Slovenia, Bulgaria, Romania	Biology domain Call for landing, discards, length, age composition, fishing effort , trawl and hydro acoustic survey in the Mediterranean and in the Black Sea 13 Templates Data Catch Landings Discards Effort Medits TA Medits TB Medits TC Medits TD Medits TE Medits TT* Abundance Biomass Abundance biomass	Quarter Quarter Quarter Day Day Day Year Day Year Year Year Year	No1967/2006	2011/August 2012/April / 29/11/2013 10/04 for Cyprus,Spain, France, Greece, Italy, Malta, Slovenia. 3/06 Bulgaria and Romania. 13/09 Mediterranean (MEDITS) data call.	2011/ September 2012/June Jun- Sept - 29/11/2013v

Name of the JRC call / relevant MS	Domain/template	Time period	regulation	Year / Month of launch	Year / Month of deadline
Call for data related to fishing effort regimes MS-22+ Azores, Madeira	Effort domain 5 templates	quarter quarter quarter year quarter	various regulations for the different areas and plans	2011/February 2012/March 20/02/2013 to the	2011/March 2012/May 3/05/ 2013
Fishing effort management schemes	<ul style="list-style-type: none"> - A_Catch - B_effort - C_speffort - D_capacity - E_landing 				

Source: feasibility study.

Formats and content

The Excel templates (Excel 97-2003 files or Excel 2007) provided on the JRC website have to be filled in and transmitted. The files must follow worksheet names and headers conventions, as well as basic formatting issues like decimal is “.”. Duplicated variable will be refused and formula is not accepted. The file size must be smaller than 7 MB else it needs to be split to respect the limits.

The upload procedure is identical for all data calls but the structure of the Excel template will differ from one data call to the other.

The definition of the variables and coding are clearly described at the place where the template can be downloaded. For some templates, there are embedded code checks, for other like Mediterranean and Black Sea, the code list to be used is displayed in column but no check is proposed when entering the data.

Data call related to the Annual Economic Report EU fishing fleet

This call contains fleet economic and transversal data.

The format slightly changed in the past 2-3 years due to the inclusion of the new variable “number of days at sea”.

Table 58. Nomenclatures used in the data call

Coding used in fleet and transversal data call	Allowed values	Comparison to DCF
Year	2008, 2009 , 2010, 2011 (for the collection performed in 2013)	
SUPRA_REGION (except for capacity where a free text is indicated for region)	AREA27 = Baltic Sea, North Sea, Eastern Arctic, North Atlantic. AREA37 = Mediterranean Sea and Black Sea. OFR = Other fishing regions. NONE = None (inactive)	same
Sub Region (for effort)	Region identifies the fishing area in accordance with FAO area level 4 for the Baltic and FAO area level 3 for all other regions.	Same
FISHING_TECH	DFN, DRB, DTS, FPO, HOK, MGO, MGP, PG, PGO, PGP, PMP, PS, TBB, TM	According to appendix III of COM Dec. 2010/93/EU
VESSEL_LENGTH	0-6, 0-10, 6-12, 10-12,12-18, 18-24, 24-40, 40-XX	Six length classes in accordance with appendix III of COM Dec. 2010/93/EU
SPECIES (for transversal - landing)	FAO 3 letter, or OTHER if the species is not specified or UNKNOWN if the species is not detected	DCF is using FAO classification
Clustername	MS own classification for cluster code can be defined and transmitted by combining a valid fishing technique and vessel length.	

Source: feasibility study.

In each template, there are 2 worksheets:

- one normal detailed by supra region, fishing technique and vessel length, cluster name and sampling information(strategy, achieved sample rate and coefficient of variation);
- one total with main variables aggregated and achieved sample rate only.

Table 59. Templates used in the call related to the Annual Economic Report EU fishing fleet: transversal data

Excel Template	Main variables (acronym)	Values	Year	Detail/aggregates
Fish enterprise	one vessel, two to five, six more vessel	In number	2008-2012	By year, supra region, fishing technique and vessel length, cluster name and sampling information(strategy, achieved sample rate and coefficient of variation) and also available as aggregate by acronym and year
Employment	TOTJOB, totnatfte, totharmfte	In number	2008-2011	
Income	totLandgInc, TotRightsInc, TotDirSub, TotOtherInc	Euro	2008-2012	
Expenditure (cost)	TotCrewWage, TotUnpaidLab, TotEnerCost, TotVarCost, TotNoVarCost, TotRightsCost, TotDepCost	Euro	2008-2011 ⁴⁴	
Capval: capital and investments	TotDepRep, TotDepHist, TotRights, TotInvest, FinPos	Euro and %	2008-2011	

Source: feasibility study.

Table 60. Templates used in the call related to the Annual Economic Report EU fishing fleet: transversal data

Excel Templates	Main variables (acronym)	Values	year	details
Capacity	Totves, totGT, totKW, AvgLOA, AvgAge	Number, Tonne, Kw, Metre, years	2008 -2013	By year, supra region, fishing technique and vessel length, cluster name and sampling information (strategy, achieved sample rate and coefficient of variation) and also available as aggregate by acronym and year
Effort	TotEnerCons, TotTrips, TotFishOpr, TotHooks, TotTraps, TotNets, TotSoakTime, IngNets	Litre, Number, metre, hours	2008 -2012	+ sub region
Landing	TotValLandg, totWghtLandg	Euro, Kg	2008 -2012	Same as previous raw + specie

Source: feasibility study.

⁴⁴ Some indicators for 2012 are estimated at high level of aggregation. 2011 is collected.

Table 61. Templates used in the call related to the Annual Economic Report EU fishing fleet: recreational fisheries

ExcelTemplates	Main variables(acccronym)	Values	Year	Detail/aggregates
Recreational fisheries	totWghtCatch	KG	2008 -2012	Year, Species : FAO 3 letter codes Region (BS, MBS, NA, NS, OFR)

Source: feasibility study.

Aquaculture data call

According with Commission Decision 2010/93/EU for the Aquaculture data collection, the population shall refer to enterprises whose main activity is defined according to the EUROSTAT definition under NACE Code 05.02 'Fish farming'.

Aggregated data are requested so that confidentiality is not an issue.

Table 62. Nomenclatures used in the call related to aquaculture

Coding used in aquaculture data call	Allowed values	Comparison to DCF
Species	FAO3 digit codes	ok
Sector segment	Segment 1.1 (Salmon Hatcheries & nurseries) to 10.4 (Other shellfish Other)	Sector segmentation as described in appendix XI of CD 2010/93/EU for fish farming techniques.

Source: feasibility study.

All DCF data to be collected as indicated in Appendix X of the regulation are collected for aquaculture. The data collection is organised in two templates as for turnover and sales only the value should be detailed by species.

Table 63. Variables in template “aqua_economic”

Main variables	
Turnover	Total in euros for values fields, detailed by the 40 sector segments for the period 2008 -2011.
Subsidies	
Other income	
Total income	
Wages and salaries	
Imputed value of unpaid labour	
Energy costs	
Raw material costs: Livestock costs	
Raw material costs: Feed costs	
Repair and maintenance	
Other operational costs	
Depreciation of capital	
Financial costs, net	
Extraordinary costs, net	
Total value of assets	
Net Investments	
Debt	
Raw material volume: Livestock	
Raw material volume: Feed	
Total sales volume	
Male employees	
Female employees	
Total employees	
Male FTE	
Female FTE	
FTE	
Number of enterprises <=5 employees	
Number of enterprises 6-10 employees	
Number of enterprises >10 employees	

Source: feasibility study.

Table 64. Variables in template “aqua_production”

Species	Use the FAO 3 letter codes (when applicable) to indicate the species.	Total turnover and sales (per species) detailed by the 40 sector segments
Turnover	Total countries turnover of particular specie(euro)	
Sales	Total sales of particular specie during the year(tonne)	

Source: feasibility study.

Fishing Processing industry data call

All DCF data to be collected as indicated in appendix XII of the regulation are collected for processing industry.

The format slightly changed in the past 2-3 years due to the introduction of request on a total and segment levels though the submission of segmented data is not mandatory.

A template is requested to estimate the number of enterprises where fish processing is not the main activity and the turnover attributed to fish processing.

The detailed data collection concerns the enterprises where fish processing is the main activity.

Table 65. Variables in template “Dcf_prodin_ma” (detailed)

Variable	Unit
Turnover	EURO
Subsidies	EURO
Other income	EURO
Total income	EURO
Wages and salaries of staff	EURO
Imputed value of unpaid labour	EURO
Energy costs	EURO
Purchase of fish and other raw material for production	EURO
Other operational costs	EURO
Depreciation of capital	EURO
Financial costs, net	EURO
Extraordinary costs, net	EURO
Total value of assets	EURO
Net Investments	EURO
Debt	EURO
Male employees	Number
Female employees	Number
Total employees	Number
Male FTE	Number
Female FTE	Number
FTE	Number
Number of enterprises <=10 employees	Number
Number of enterprises 11-49 employees	Number
Number of enterprises 50-249 employees	Number
Number of enterprises >=250 employees	Number
Total number of enterprises	Number

Source: feasibility study.

Mediterranean (MED) & Black Sea (BS) – “SGMed” data call

Table 66. Nomenclatures used in the call related to Mediterranean (MED) & Black Sea (BS)

Coding data calls	Allowed values	Comparison to DCF
Year	2008, 2009 , 2010, 2011 (for the collection performed in 2013)	According to CD 93/2010
country	3 characters	
VESSEL_LENGTH	0-6, 6-12, 12-18, 18-24, 24-40, 40-XX	
GEAR	27 CODES	
MESH SIZE RANGE	00D14, 14D16, 16D20, 20D40, 40D50,50D100,100D400,400DXX,00S40,40SXX	
FISHERY	BFTE,CATSP,CEP,DEMF.	
AREA	SA 1 to 30 (FAO areas for MBS)	
SPECIES	FAO 3 letter, or OTHER if the species is not specified or UNKNOWN if the species is not determined	
SEX	F,M,U,C	

Source: feasibility study.

Table 67. Variables in template related to catch, landing, discards and effort

Catch template	Landing and discards template	Effort template
COUNTRY YEAR QUARTER VESSEL_LENGTH GEAR MESH_SIZE_RANGE FISHERY AREA SPECON SPECIES LANDINGS DISCARDS NO_SAMPLES_LANDINGS NO_LENGTH_MEASUREMENTS_LANDINGS NO_AGE_MEASUREMENTS_LANDINGS NO_SAMPLES_DISCARDS NO_LENGTH_MEASUREMENTS_DISCARDS NO_AGE_MEASUREMENTS_DISCARDS NO_SAMPLES_CATCH NO_LENGTH_MEASUREMENTS_CATCH NO_AGE_MEASUREMENTS_CATCH MIN_AGE MAX_AGE from AGE_o to age_20_PLUS... AGE_o_NO_LANDED AGE_o_MEAN_WEIGHT_LANDED AGE_o_MEAN_LENGTH_LANDED AGE_o_NO_DISCARD AGE_o_MEAN_WEIGHT_DISCARD AGE_o_MEAN_LENGTH_DISCARD	SPECIES LANDINGS/discards UNIT LENGTHCLASSo to LENGTHCLASS100_PLUS	NOMINAL_EFFORT GT_DAYS_AT_SEA NO_VESSELS

Table 68. Variables in templates related to MEDITS (6) corresponding to forms and 2012 instructions.

TA type	TB type	TC type	TD type	TE type	TT type
COUNTRY	COUNTRY	COUNTRY	COUNTRY	COUNTRY	YEAR
AREA	AREA	AREA	AREA	AREA	COUNTRY
VESSEL	VESSEL	VESSEL	VESSEL	VESSEL	AREA
GEAR	YEAR	YEAR	YEAR	YEAR	VESSEL
RIGGING	MONTH	MONTH	HAUL_NUMBER	MONTH	HAUL_NUMBER
DOORS	DAY	DAY	BOTTOM_TEMPERATURE_BEGINNING	DAY	NUMBER_OF_THE_STRATUM
YEAR	HAUL_NUMBER	HAUL_NUMBER	BOTTOM_TEMPERATURE_END	HAUL_NUMBER	
MONTH	CODEND_CLOSING	CODEND_CLOSING	MEASURING_SYSTEM	FAUNISTIC_CATEGORY	
DAY	PART_OF_THE_CODEND	PART_OF_THE_CODEND		GENUS	
HAUL_NUMBER	FAUNISTIC_CATEGORY	FAUNISTIC_CATEGORY		SPECIES	
CODEND_CLOSING	GENUS	GENUS		LENGTH_CLASSES_CODE	
PART_OF_THE_CODEND	SPECIES	SPECIES		SEX	
SHOOTING_TIME	NAME_OF_THE_REFERENCE_LIST	LENGTH_CLASSES_CODE		NO_PER_SEX_MEASURED_IN_SUB_SAMPLE_FOR_OTOLITH	
SHOOTING_QUADRANT	TOTAL_WEIGHT_IN_HAUL	WEIGHT_OF_THE_FRACTION		LENGTH_CLASS	
SHOOTING_LATITUDE	TOTAL_NUMBER_IN_HAUL	WEIGHT_OF_THE_SAMPLE_MEASURED		MATURITY	
SHOOTING_LONGITUDE	NUMBER_OF_FEMALES	SEX		MATSUB	
SHOOTING_DEPTH	NUMBER_OF_MALES	NO_OF_INDIVIDUAL_OF_THE_ABOVE_SEX_MEASURED		INDIVIDUAL_WEIGHT	
HAULING_TIME	NUMBER_OF_UNDETERMINED	LENGTH_CLASSES		NO_PER_SEX_MEASURED_IN_SUB_SAMPLE_FOR_WEIGHT	
HAULING_QUADRANT		MATURITY		OTOLITH_SAMPLED	
HAULING_LATITUDE		MATSUB		NO_PER_SEX_MEASURED_IN_SUB_SAMPLE_FOR_AGEING	

HAULING_LONGITUDE		NUMBER_OF_INDIVIDUALS_IN_THE_LENGTH_CLASS_AND_MATURITY_STAGE		OTOLITH_READ	
HAULING_DEPTH				AGE	
HAUL_DURATION				OTOLITH_CODE	
VALIDITY					
COURSE					
RECORDED_SPECIES					
DISTANCE					
VERTICAL_OPENING					
WING_OPENING					
GEOMETRICAL_PRECISION					
BRIDLES_LENGTH					
WARP_LENGTH					
WARP_DIAMETER					
HYDROLOGICAL_STATION					
OBSERVATIONS					
BOTTOM_TEMPERATURE_BEGINNING					
BOTTOM_TEMPERATURE_END					
MEASURING_SYSTEM					
NUMBER_OF_THE_STRATUM					

Source: feasibility study.

Table 69. Variables in templates related to abundance and biomass (3 templates)

Biomass_medbs template	Abundance_medbs template	Abund_bio_medbs template
COUNTRY YEAR AREA NAME_OF_SURVEY SPECIES SEX UNIT LENGTHCLASS0 LENGTHCLASS100_PLUS	COUNTRY YEAR AREA NAME_OF_SURVEY SPECIES SEX UNIT LENGTHCLASS0 LENGTHCLASS100_PLUS	COUNTRY YEAR AREA NAME_OF_SURVEY SPECIES SEX AGEGROUP0ABUND AGEGROUP0BIOM AGEGROUP20_PLUSABUND AGEGROUP20_PLUSBIOM

Source: feasibility study.

Effort regime data call

Fishing effort regime data call changes due to the introduction of a new species and a new capacity variable for the Baltic Sea fisheries.

Table 70. Nomenclatures used in the call related to effort regime

Coding data calls	Allowed values	Comparison to DCF
Year	2002-2012 (for the collection performed in 2013)	
country	3 characters (24 countries / regions)	
VESSEL_LENGTH	Atlantic areas : -10m, 10-15, 15+ Baltic Sea : -8, 8-10, 10-12, 12-18, 18-24, 24-40 40+	Not consistent with DCF. Length classes used to maintain time series
GEAR	Otter (OTB, OTT, PTB) Dem_seine (SSC, SDN, SPR) Pelagic_trawl (OTM, PTM) Pelagic_seine (PS) Dredge (DRB, HMD) Hooks (LHP, LHM, LTL, LLD, LLS) Gillnets (GNS, GND) Trammel (GTR) Pots (FPO)	
MESH SIZE RANGE	Size range	According to management regime.
AREA	FAO level 3	
SPECIES	FAO 3 letter,	
SPECON (landing)	BACOMA, CPart11, CPart13..., DEEP, IIA83a, IIA83b...	
RECTANGLE	01A2, 01A3, 01B0, 01B1, 01B2...	

Source: feasibility study.

Table 71. Variables in templates related to effort call

Catch	Effort	Speffort	Capacity	Landing
COUNTRY				
YEAR				
QUARTER				
VESSEL_LENGTH				
GEAR				
MESH_SIZE_RANGE				
FISHERY				
AREA				
SPECON				
SPECIES				
LANDINGS	COUNTRY			
DISCARDS	YEAR			
NO_SAMPLES_LANDINGS	QUARTER			
NO_LENGTH_MEASUREMENTS_LANDINGS	VESSEL_LENGTH	COUNTRY		COUNTRY
NO_AGE_MEASUREMENTS_LANDINGS	H	YEAR	COUNTRY	YEAR
NO_SAMPLES_DISCARDS	GEAR	QUARTER	YEAR	QUARTER
NO_LENGTH_MEASUREMENTS_DISCARDS	MESH_SIZE_RANGE	VESSEL_LENGTH	VESSEL_LENGTH	VESSEL_LENGTH
NO_AGE_MEASUREMENTS_DISCARDS	NGE	H	GEAR	H
NO_SAMPLES_CATCH	FISHERY	GEAR	AREA	GEAR
NO_LENGTH_MEASUREMENTS_CATCH	AREA	MESH_SIZE_RANGE	NO_VESSELS	MESH_SIZE_RANGE
NO_AGE_MEASUREMENTS_CATCH	SPECON	NGE	FISHING_CAPACITY_KW	NGE
MIN_AGE	FISHING_ACTIVITY	FISHERY	FISHING_CAPACITY_GT	FISHERY
MAX_AGE	FISHING_CAPACITY	AREA	FISHING_ACTIVITY_DAYS	AREA
AGE_o	CITY	SPECON		SPECON
AGE_o_NO_LANDED	NOMINAL_EFFORT	RECTANGLE		RECTANGLE
AGE_o_MEAN_WEIGHT_LANDED	GT_DAYS_AT_SEA	EFFECTIVE_EFFORT		SPECIES
AGE_o_MEAN_LENGTH_LANDED	NO_VESSELS			LANDINGS
AGE_o_NO_DISCARD				
AGE_o_MEAN_WEIGHT_DISCARD				
AGE_o_MEAN_LENGTH_DISCARD				
...				
AGE_20_MEAN_LENGTH_DISCARD				

Source: feasibility study.

3.3.3.b. SAIKU dissemination database

Procedures

Data extracted from the production databases are endorsed by STECF, published in the relevant STECF reports. They are after that made accessible on the STECF web⁴⁵ (report and Excel files) site and finally uploaded in the SAIKU database for dissemination on the JRC website. The JRC web site allows the exploration through interactive tables and charts of the aggregated data published in STECF reports.

Formats and content of the SAIKU database

The data are aggregates from the data calls. The following information are made available on the web site on two different categories: “data” corresponding to variables collected in the fleet data calls and effort data calls, “economic indicators” category displaying indicators taken from or calculated on the basis of such DCF data on fishing fleet, aquaculture and fish processing industry data calls as verified by STECF. More precisely, while some data such as employment may be directly taken from the DCF data and used as indicator, in most cases the indicators are derived from those data, e.g. as labour productivity (Euro/FTE) or economic profit margin.

The scientific data was first made available during April 2012. The economic indicators were made available by May 2013.

DATA TAB

The “data” tab includes data on landings and discards, transversal data on effort and economic data on the performance of the fishing fleet.

The information provided in the “data” tab are summarised in the table below which gives which dimensions can be customised (cross in the column) and which variable can be presented in the proposed table (Variable column)

⁴⁵ <https://fishreg.jrc.ec.europa.eu/web/datadissemination>

Table 72. Dynamic reports proposed in the SAIKU dissemination (“data” tab)

dynamic reports (Table)	Dimension details										Variables
	supra region	region	area	Condition(1)	country	gear	length	year	species	note	
TRANSVERSAL (aer 2012) report											
capacity	x				x	x	x	x			-Average vessel age (year) -Average vessel length (m) -engine power (kw) -total number of vessel(nb) -vessel tonnage (gt)
effort		x			x	x	x	x			-days at sea(days) -fishing days(days) - gt per fishing days (gtdays) -kw per fishing days (kwdays)
landings		x			x	x	x	x	x		- live weight of landings (kg) - value of landings (euros)
ECONOMIC t (2008-2011)											
employment	x				x	x	x	x			- full time equivalent (national) (nb) -full time equivalent harmonised(nb) - total fishers employed(nb)
entreprises	x				x	x	x	x			- enterprises with 2 to 5 vessels(nb) -enterprises with more than 5 vessels(nb) -enterprises with no vessel(nb)
income/expenditure capital	x				x	x	x	x			-capital cost(euro) -energy cost(euro) -engaged crew(nb) -full time equivalent(nb) -gross added value(euro) -income (euro) -investment (euro) -non variable costs (euro)

dynamic reports (Table)	Dimension details										Variables
	supra region	region	area	Condition(1)	country	gear	length	year	species	note	
											-operation cash flow (euro) - profit(euro) - repair and maintenance costs (euro) -total number of vessels (nb) -total vessel power (kw) -total vessel tonnage(gt) - variable costs(euro) -salaries and wages of the crew(euro)
BIOLOGICAL											
Baltic Sea			x	x	x	x	x	x	x	x	(2)
Bay of Biscay											discards(t) effort (log. days)

dynamic reports (Table)	Dimension details										Variables
	supra region	region	area	Condition(1)	country	gear	length	year	species	note	
Black Sea											
cod recovery zone											
deep sea											
entire Celtic Sea											
fully documented fishery Baltic											
fully documented fishery cod recovery zone											
fully documented fishery sole											
Mediterranean Sea											
partial Celtic Sea											
sole Western Channel											
southern hake and nephrops											
western waters											
DCR (2002-2007)											
economic					x	x	x	x			-annual depreciation cost -direct income subsidies -energy cost -fishing rights -income from landing -income from leasing fishing rights - investment (capital value) -non variable costs -other income - other variable costs - repair and

dynamic reports (Table)	Dimension details										Variables
	supra region	region	area	Condition(1)	country	gear	length	year	species	note	
											maintenance -right costs -tangible asset value (historical) -tangible asset value (replacement) -unpaid labour value -salaries and wages of the crew
landings			x		x	x	x	x	code and name		-quantity -value

Source: feasibility study.

1. The field "Special condition" specifies the management option under which fisheries may have chosen to operate within a specific fisheries management regime. The "Area" refers to fishing areas defined by Regional Fishery Management Organizations in the case of biologic data and by FAO area in the case of economic data.
2. Source (From the FAQ of the dissemination web site) Landings, discards and effort values for biologic data are processed with the main purpose of facilitating the aggregation in respect of fishery management regimes. A management regime groups the areas covered by a specific regulatory approach to fisheries management. Length classes, gear, special condition and area are defined for each management regime independently, and therefore variable names may not be consistent across management regimes. Within each fishery management regime the special condition specifies the management option under which fisheries may have chosen to operate (e.g. the selection of the Deep sea fisheries regime groups data for all the areas affected the deep sea regulations and the selection of the special condition deep sea allows to select fishing activities performed in these areas by vessels with the a deep sea license and targeting deep sea species).

ECONOMIC INDICATORS TAB

“Economic indicators” tab gives access to a set of context socio-economic indicators published in the STECF reports on the EU fishing fleet, aquaculture and processing industry. The indicators are intended to support DG MARE and Member States in the development and monitoring of measures under the European Maritime and Fisheries Fund (EMFF). Hence, under the “economic indicators” tab, no comprehensive results from economic data calls or STECF reports are disseminated, but only some of those indicators preliminary defined as context indicators for the

new EMFF⁴⁶. The information provided in the “economic indicators tab is summarised in the table below.

Table 73. Tables proposed in the SAIKU dissemination (“Economic indicators” tab).

Dataset	Indicator	Fleet segment	Country
Fish Processing industry	Average wage(Euro) Capital Productivity (%) EBIT to turnover ratio (%) Earnings before interest and taxes (million euros) Employment (FTE female) Employment (FTE male) Employment (FTE) Future expectations of the industry (%) GV as % of the revenue Gross value added (million euros) Labour productivity (euros/FTE) Net profit margin (%) Running Cost to turnover ratio (%) Turnover (million euros)	No segment	22 countries : Belgium; Bulgaria; Cyprus; Denmark; Estonia; Finland; France; Germany; Greece; Italy; Ireland; Latvia; Lithuania; Malta; Netherlands; Poland; Portugal; Romania; ; Slovenia; Spain; Sweden; United Kingdom
Aquaculture	Same dimensions as fish processing dataset are available completed by Total volume of sale (t)	sector segmentation as of appendix XI of DCF 93/2010 meaning 40 segments +”all”	18 countries : All countries recorded for Fish processing industry except Belgium, Greece, Latvia, Lithuania Note: some of the indicators are sometimes not provided for the 18 countries.
Fleet	As for the two previous sectors: Average wage(Euro) Capital Productivity (%) Employment (FTE) Labour productivity (but here in Thousand euros) Completed by: Economic profit (Million euros) Economic profit margin % Fuel efficiency (litre/kg) GVA (million euros) GVA to revenue (%) Gross Profit (Million euros) Gross Profit margin (%) Operating Profit (million euros) Operating Profit margin (%) Revenue (million euros)	Fleet segmentation as of appendix III of DCF 93/2010 Meaning 38 segments + “All” Note that length classes 12-18 and 18-24 m should be indicated in the segment, while these segments are merged in the economic indicators dataset.	22 countries: All countries recorded for Fish processing industry

Source: feasibility study.

⁴⁶ see: DG MARE, Guidance Fiche NO 3 Common indicators in the EMFF, Version 1 – DATE 21/5/2013
http://ec.europa.eu/fisheries/reform/emff/guidance-fiche-3-common-indicators_en.pdf

Comparison between data collected in data calls and data disseminated

The data from the fleet economic data call are disseminated on the web site in the “data” tab under the rubric “TRANSVERSAL (AER 2012) report” and “ECONOMIC (AER 2012) report“. Economical indicators are also presented in the “economical indicators” tab.

Part of the information collected in the effort regime data calls can be found under the rubric “Biological”(title is a bit confusing) in the “data”.

Information from the data call on aquaculture and fish processing is available in the respective STECF reports (pdf files) and economic indicators are also elaborated and presented in the “economic indicators” tab.

Transversal data collected in Mediterranean and Black Sea data call are partly the same as information collected in effort regime data calls but the landing and discards are requested by species in the last one.

Some data collected are not disseminated in the SAIKU like recreational fisheries or biological data from Mediterranean and Black Sea data call especially the MEDITS measurements.

The Excel files available on STECF web site, often provides the same level of aggregation than the data call answer requested from MS. In addition, the data published are not at the same level of update as illustrated bellow:

- Deadline of the data call for Data related to the Annual Economic Report EU fishing fleet was 4/2/2013
- Excel file on STECF the 25/09/2013 (7 months after the deadline)
- SAIKU data tab was updated for the last time on 13/7/2012 and economic indicator on 17/5/2015 so both do not contain the 2011 data, which are in the Excel files disseminated in STECF.

1.3.4. Quality Control

3.3.4.a. JRC production database

Data validation

Production database

Data validation occurs for aggregated data for biological stock and métier related data, transversal data (catch/landing), capacity, effort as well as for economic data.

For transversal and economic data all quantitative tests (Std. deviation, Coefficient of variation, Sample size, Sampling rate, Response rate, Coverage rate) are performed by software. (See storage of data quality indicator chapter and the MS data quality report).

Typing errors, Arithmetic checks, Logical checks, Range/outliers (cross section, time series) are performed in the database. The procedures are implemented in PLPGSQL and the results are stored in views located under a schema.

The qualitative tests are presented in the table below.

Table 74. Check on the quality of AGGREGATED transversal and economic data

	Catch / landings		Capacity		Effort		Fleet		Processing		Aquaculture
	No	Software check	Software check	No	Software check	No	Software check	No	Software check	Software check	
• Availability		X	X	X		X		X		X	
• Accessibility	X		X	X		X		X			
• Missing		X	X		X		X		X	X	
• Duplicated records		X	X		X		X		X	X	
• Timeliness		X	X		X	X		X		X	
• Coding		X	X		X		X		X	X	
• Other							X				

Source: Feasibility study

The following table concerns aggregated biological checks for métier and stock related data.

Table 75. AGGREGATED biological check

	Biological – métier related data				Biological – stock related data			
	Not relevant	No	Manu- al check	Soft- ware check	Not relevant	No	Manu- al check	Soft- ware check
• Availability		X				X		
• Accessibility		X				X		
• Missing values				X				X
• Duplicated records				X				X
• Timeliness				X				X
• Coding				X				X
• Other								
•								
• Std. deviation								
• Coefficient of variation								
• Sample size								
• Sampling rate								
• Response rate				X				X
• Coverage rate				X				X
• Other								
•								
• Typing errors				X				X
• Arithmetic checks				X				X
• Logical checks				X				X
• Range/ outliers								
○ cross section								
○ time series				X				X
• Other sources								
• Other								

A data validation tool (DV) is proposed for some of the data calls namely the calls related to the economics of fishing fleet, Mediterranean and Black Sea, and effort regime.

Using the DV tool allows preparing clean data to be uploaded on JRC site. The data validation tool is a set of macros developed in Visual Basic for Applications (VBA) and embedded in a specifically designed Excel Workbook template which helps to identify and fix common data issues like:

- Data format
- Structure of the Excel file checks : variable names in the worksheet
- Coding, value >0 and inter-field consistency checks
- Check of duplicated rows

The data validation tool allows also splitting the files if the size is too big (>7 MB).

Most of the tests are performed automatically. Some are done at the source level directly in the template, at upload level in the database and finally by running quality analysis of the data (whose results are transmitted to the MS) and analysis in STECF WGs groups (for the two last points, please refer to the storage of data quality indicators section).

3.3.4.b.SAIKU databases

Quality of the data uploaded in the SAIKU DB is assured by the validation procedure carried out during the STECF WG meeting.

No other tests than validation performed by the EWG, is done before uploading the data in SAIKU.

Storage of quality indicator

Quality indicators are performed for some aggregated biological stock related, biological métier related, catch / landings, capacity, effort and economic data of fleet data.

JRC has developed quality reports printed in PDF format including statistical analysis performed in R. These reports are transmitted to MS to support them in identifying possible data issues, gaps, outliers, encoding problems, time series with high fluctuations, errors in units or data processing, inconsistencies, data missing etc. MS are asked to look and comment the errors highlighted by JRC in the report as well as in general to review all analyses presented in the report in order to identify eventual problems in the data provided.

JRC elaborates coverage reports. They are normally issued one month after the STECF meeting to also include considerations on data quality by the experts of the EWG.

From the summary of the coverage report for the DCF data calls 2012⁴⁷, it appears that the following aspects are mainly analysed:

- Availability of the data: independently of the date of submission;
- Timeliness : respect of the deadline of the data call;
- Completeness: regarding the criteria of the STECF working groups to provide the requested scientific advice meeting. This evaluation may also consider the quality of the data.

1.3.5. Dissemination

Confidentiality of data

No confidential data is collected

Restricted access (WGs + Internal staff), including confidentiality

Production data are only accessible internally. An extraction can be prepared for the working groups.

Public Access

As mentioned on JRC web site⁴⁸, “The purpose of the JRC online database is to allow the exploration through interactive tables and charts of the aggregated data published in STECF reports. The data includes biologic data on landings and discards, transversal data on effort and economic data on the performance of the fishing fleet.

The data presented here was collected and processed for specific scientific advisory purposes. It does not represent official fishery statistics as the ones published by Eurostat. It is strongly recommended to refer to STECF reports in order to get details on the conclusions and recommendations that have been drawn from the analysis of the data.”

JRC does not have an active dissemination policy. Legally JRC cannot disseminate directly DCF data, that’s why the dissemination is based on the data validated by the STECF, and then already made publicly available. All STECF reports are also available on the JRC website, including those evaluating the quality of data submissions⁴⁹.

⁴⁷ http://datacollection.jrc.ec.europa.eu/c/document_library/get_file?uuid=5cab4009-3ef0-487a-8c62-5a97e07a41de&groupId=10213).

⁴⁸ <https://fishreg.jrc.ec.europa.eu/web/datadissemination>

⁴⁹ <http://datacollection.jrc.ec.europa.eu/docs/coverage>

In addition to the JRC Fishreg website, STECF data can also be downloaded in Excel format on STECF web site⁵⁰.

Technical functionalities

The SAIKU database is accessible through a standard web browser. No logging is required.

The data can be extracted from the database in two different ways:

- “Data” tab: presents tables which can be dynamically designed by selecting the column and line dimensions, and even filtering some element in the axes selected. It allows displaying information in graphs, exporting data to Excel or csv. It provides statistics on the selected table (min, max, sum, average, standard deviation).
- “Economic indicators” tab: presents predefined tables by country and year for dimensions chosen and the sector segment corresponding to the dataset selected (aquaculture, fish processing industry, fleet). It allows displaying information in chart, exporting data to csv.

1.3.6. Institutional Considerations

On its website, JRC portrays itself as follows⁵¹: “The Joint Research Centre is the scientific and technical arm of the European Commission. It is providing the scientific advice and technical know-how to support a wide range of EU policies. Its status as a Commission service, which guarantees independence from private or national interests, is crucial for pursuing its mission:

“As the Commission's in-house science service, the Joint Research Centre's mission is to provide EU policies with independent, evidence-based scientific and technical support throughout the whole policy cycle. Working in close cooperation with policy Directorates-General, the JRC addresses key societal challenges while stimulating innovation through developing new methods, tools and standards, and sharing its know-how with the Member States, the scientific community and international partners.”

Legal

Legal basis

JRC is a service of the EU Commission. As such, it can be entrusted by General Directorates of the EC with specific tasks. This possibility is made use of in the context of various policies, i.a. the Common Fisheries Policy.

Such a delegation of tasks is governed by a specific administrative arrangement. In case of fisheries data collection, this is e.g. Administrative Arrangement N °SI2.648254 between the

⁵⁰ <http://stecf.jrc.ec.europa.eu/data-reports>

⁵¹ <http://ec.europa.eu/dgs/jrc/index.cfm?id=1370>



Directorate General for Maritime Affairs and Fisheries (DG MARE) and the Joint Research Centre (JRC), JRC CONTRACT No. 33236-2013 NFP, which defines exact tasks and activities.

Relation to EU legislation

JRC is entrusted with activities under various EU policies, among these Common Fisheries Policy and Marine Strategy Framework Directive.

Administrative

Guarantee of confidentiality

JRC has in its statutes provisions regarding data protection and confidentiality. These provisions do not, however, refer explicitly to DCF databases. DCF data/databases have a proper governing framework laid down in Reg. (EC) 199/2008.

In addition, Annex III of the above mentioned Administrative Arrangement contains specifications on Data Security.

Adaptation of statutes for confidentiality

Not applicable/necessary.

Financial

Funding

JRC is an EU institution and funded as such.

Staff and Budget for DB development

JRC is using internal and external staff for database management. It has a dedicated budget for database development (130,000 Euro accumulated for the last 3 years).

In 2012, they spent about 30,000 Euro for hosting infrastructure and 100,000 Euro for IT maintenance.

1.4. DG MARE

1.4.1. Summary

DG Mare plays a central role in preparation and formulation of the CFP and consequently it is the major user of information and data products based on the DCF. This applies to most (if not all) units, with the exception of Directorate F (Resources).

DG Mare receives from the MS information required on the basis of the Control Regulation (CR).

Information from DCF and CR is mostly complementary. It becomes available at different time schedules and is mostly used for different purposes. There is one major relation between CR and DCF. Unit D4 receives monthly information on catches and effort, which overlaps with the annual Effort data call. However, the DCF data can be based on a sample of vessels (according to the agreed approach of the National plan), while the CR data is based on census.

Execution of DCF is the responsibility of DG Mare. Technical implementation has been delegated to JRC. The following sections focus on DG Mare alone.

1.4.2. Data Storage and Access

Storage of DCF data is carried out by JRC and ICES. DG Mare as such is a user of data products coming either directly from JRC or ICES or from STECF WGs. DG Mare does not maintain any DCF databases.

DG Mare maintains two separate DBs in relation to the control regulation, on landings and effort. This data is not used in any way in relation to DCF.

Access to control data is essential in the individual MS. Control data is the primary source of transversal variables and it is used for the purposes of planning of sampling.

Overview

DG Mare hosts two separate databases for its own use. Consequently, there is no distinction between production and dissemination DB.

Unit D4 collect the following data:

1. Fishing effort (art. 26),
2. Catch data (art. 33),
3. data on exhaustion of fishing opportunities (art. 34),
4. closure by MS (art. 35);
5. Fleet data from the basic regulation; = fleet register
6. licenses,
7. vessel notifications and catches from the Fishing Authorisation Regulation;
8. Other control data reports from FPA and RFMO agreements – this comes from the MS or from RFMOs.
9. VMS (art 9);
10. eRS (art 15);

The current situation in terms of format and level of aggregation is extremely complicated. Depending on the Member States, the target species, on the area, formats and aggregation levels vary. There is no common definition. With the new Aggregated Catch Report recommended by INTREP project, the format and aggregation will be standardized and all MS will report with this



format. The new ACR will be a UN/CEFACT standard. On the long run, all above mentioned data will be standardized as UN/CEFACT standard.

Connection

Data are provided by the MS to Unit D-4 of DG Mare through the FIDES system in XML-format. This system is quite old, covers several kinds of data exchanges mechanisms and is aimed to be replaced by a new reporting system, FLUX (see Annex 2.8.), in the coming years. This activity has already been started with CR, no longer using FIDES but a predecessor of FLUX.

FLUX (Fisheries Language for Universal eXchange) combines a transportation layer (a communication system to transport any message in an envelope and safely and securely transport it from one end-point to another) and a business layer (definition of the format of the message inside the envelope and submission for adoption as UN/CEFACT standard). Both are independent but complementary.

The transportation layer is star shape network, with a central node (DG MARE) and endpoints (MS). This organization can be expanded to any kind of centralized or decentralized systems, by simply defining what are the central nodes (DG MARE, Regional organisations or regional databases) and the endpoints (MS, RFMO, RCM, others). Each end point is equipped with the FLUX Software which plays the role of a FLUX terminal: content is attached to the FLUX message; recipient and type of data (the message object) are indicated. The FLUX software sends the message to the central node which takes care of its distribution and the possible errors (what if the end point is not reachable?)

FLUX is using secured SSL protocol given that confidential data will be transported (VMS and eRS data from vessels).

The impact of FLUX for a MS will be limited: a new piece of software will be installed, and will be used to send the current CR to DG MARE. In the very near future, the adoption of a common standard for ACR will have a deeper impact on the MS as the CR should be adapted to the MS to the new format.

It means that current DCF data could be easily transported in the coming FLUX transportation layer. It would later require a standardization effort of DCF format and code lists in UN/CEFACT.

A first FLUX software prototype has been developed and is now being tested with few MS; it should be operational by 2014. The business layer is now focusing on submitting Aggregated Catch Report, VMS and fishing trip (eRS) standard to UN/CEFACT. 2014 ACR should be reported through FLUX. VMS data should follow. eRS version 3 should be totally replaced by 2015 and FIDES should cease functioning early 2016.

Reporting to RFMO should go through the same standardization process, NEAFC, NAFO and IOTC reporting will be standardized.

Data base structure

2 databases for Catch report and Effort are available:

- DataWarehouse for Monthly Catch Report widely updated and use for reporting
- FEONT for effort, but limited for reporting and data use.

A new project is aiming to setup a new Data Warehouse (DWH2), especially to address double declaration MS and Eurostat issue and the need to consider integration of non EU data (From Norway as a start). This new DWH2 will concern only Catch Report. Effort will not be addressed in this phase.

A plan on the middle term is to extrapolate effort from eRS and VMS data received from MS through the newly setup FLUX (A regulation from October 2103 allows DG MARE to collect from MS any needed data for regulation purpose).

Aggregation level (variables and dimensions)

Aggregation level provided by the MS under the CR is presented in the following table.

Table 76. Data aggregation level

Dimension	Catch / stock	Effort / effort regime area	Relation to DCF (Effort regime data call)
Geographic	FAO area level 3	ICES areas applicable to the management plan	Areas applicable to the mgt. plan
Time	Month – TAC species Quarter for non-TAC species	Month	Quarter
Vessel size	n.a.	n.a.	10 size categories
Gear	n.a.		10 gear types
Mesh size	n.a.	determined by the management plan	According to mgt. plan
Regularity of reporting		Monthly till 2013 Quarterly as of 2014	Annual

The new ACR as per described in the document referenced MARE D4/MB D(2013) Ver. 0.4 will have the same dimensions as above.

Data processing and estimations

DG Mare does not carry out any data processing or estimations in relation to DCF.

DG MARE processing is limited to aggregation of data from the Catch Reports to meet the different requirements for the different reporting formats as for FPA, RFMO.

1.4.3. Data Upload

Procedures

MS submit the data through the FIDES system.

No technical guidelines are available for FIDES. As stated before, this old system is in the process of being replaced by FLUX.

The current situation is very complex in terms of data flow; data can come from MS, from Eurostat, even from RFMO in certain cases. It has an impact on the quality of reported data (given the complexity of reporting, fishermen can find it difficult to report in the correct format and to the correct institution).

Formats and content

The used format is XML.

All formats are in the process of being standardized in the FLUX business layer starting with ACR.

DCF should be part of the process, though no indication on plan to actually do it has been mentioned.

1.4.4. Quality Control

DG Mare does not carry out any quality control of the DCF data. It relies on procedures established by JRC.

DG MARE is now requesting Members States to run validations process on raw data before submission to the commission. The VALID project is assisting MS to implement these validation processes, with a delivery date of 31st of December 2013 for implementing 7 core business rules.

Table 77. Core Business Rules

data source	Check data source	Check data fields	Check description
VMS	VMS	Timestamp; Port information	Delay between subsequent VMS positions at sea <= 12 hours
VMS	Logbook	FAR declaration; date	A logbook entry (FAR declaration) must be available for every calendar day with VMS positions at sea
Logbook	Landing declaration	species	Comparison of logbook entries re. species (catches, quantities on board, transshipments, discards) with species stated in the landing declaration.
Logbook	Prior notification	timestamp	
Logbook	Fishing authorisations	Details on area, gear and species	Verify whether the combinations of fishing area, gear and species entered in a declaration of catches, are consistent with valid combinations according to a valid fishing authorisation. (excluding catches taken for the purpose of scientific research)
Landing declaration	Declarations of commercialization	species	Check whether landed species match species stated in the declarations of commercialisation (usage, transport declarations, take-over declarations).
Sales note	Fleet register	Available yes/no	

The above core business rules have been established by VALID Working Groups meeting on a regular basis (last one was in Brussels in September). A VALID guideline document version 0.8 is available.

These validations processed will be also implemented by DG MARE after reception of ACR to run validation on received reports, to validate the same business rules and apply customized ones. The system is design to be flexible enough to design one's own business rules.

A set of tools is already being developed by DG MARE (based on JBoss business rule engine and Java), implemented in DG MARE and reusable by MS as this solution is entirely open source. It could be reused in any DCF scenario to run specific validations process to a set of data.

DG MARE has now a Master Data Register aiming to share common code lists across systems. The importance of sharing and using this MDR has been highlighted, especially to DCF given the previous experiences with DCF definition of Master Data. Complying with common master data and having a central repository for validation will increase the quality of data checks.

1.4.5. Dissemination

DG Mare does not carry out any dissemination of the DCF data. It relies on procedures established by JRC and STECF.

It is important to repeat here that DG MARE reporting obligations will meet the same formalism as the

1.4.6. Conclusion

The current situation in terms of reporting to DG MARE is quite complex. Data are being reporting from various sources under various formats. After assessing the situation (INTREP project among others), DG MARE came with a proposal to harmonize the reporting processing and the reporting content. The FLUX initiative has been started to standardize both a transportation layer (a secured software to transport any kind of data from endpoint A to endpoint B) and a business layer (A standard definition of the exchanged fisheries data). This FLUX system is tailored to DG MARE need in terms of catch reports but is designed to be generic enough to adapt to any of the DCF scenarios and propose a secured transportation layer. FLUX Central services such as Master Data Register or side projects like VALID will provide addition tools to run validation processes for exchanged data at different levels in the dataflow. These tools and services developed for the Integrated Fisheries Data Management programme would be a strong resource for a new DCF as exchange services for the new architecture.

1.5. GFCM

1.5.1. Summary and conclusions

GFCM purpose is to promote the development, conservation, rational management and best utilization of living marine resources, as well as the sustainable development of aquaculture in the Mediterranean, Black Sea and connecting waters.

(not foreseen, but will be useful for chapter 8)

- Conclusions from the separate sections
 - Duplications and similarities: GFCM collects from EU members similar kind of data as DCF but at a more aggregated level (Task 1 database).
 - Differences (in aggregation levels): there is no detailed data by age and length classes. Aquaculture data are only available for species (not economic data for the production centers)
 - Simplifications: This collection process is needed given that half of GFCM members are not EC member. The process could be simplified by EU sending DCF data to GFCM.

- Strengths and weaknesses: GFCM strengths are its institutional setup and staffing. The IT environment is well managed and fit its needs. Main weakness reported is the need for additional resources for development.

Table 78. Strengths and weaknesses

	Task 1		SIPAM (Aquaculture)		Authorized Vessel List	
	Strengths	Weaknesses	Strengths	Weaknesses	Strengths	Weaknesses
Organization / management	n/s	n/s	X		X	
Dedicated staff	n/s	n/s	X		X	
Financing	n/s	n/s		X		X
Hardware	n/s	n/s	X			X
Software	n/s	n/s	X			
Training possibilities	n/s	n/s				
Development possibilities	n/s	n/s		X		X

Table 79. Swot analysis

	Strengths	Weaknesses	Opportunities	Threats
Data storage – production DB	Data structure is well defined according to GFCM recommendations	No detailed data regarding DCF requirements are available	Database structure and reference data are DCF compliant, though with a higher level of aggregation	
Data access – distribution DB		No web service to access database		
Data up-load	Excel and XML templates are provided to MS		Generalization of XML format should allow automatic upload Future implementation of automated data exchanges mechanisms through sharepoint	Upload process is relying on Excel / XML files from MS: risk
Quality control	Most of quality controls are automatically done		Generalization of XML format will improve the quality check	
Dissemination	Advanced query tool for SIPAM A reporting tool to create pdf exists	No advanced query tools apart from SIPAM		
Institutional considerations	IT resources are available within GFCM with a good knowledge of their IT tools	Only one person is dedicated to IT matters, no additional resource is available for additional development		Half of GFCM members are not EC members (No memorandum of understanding with EC.)

1.5.2. Database set-up

Overview

Identification of the databases

Table 80. Databases – names and domains

Name of the database	Domain covered by the database	Production / dissemination DB
Vessel Records	Data of all fishing vessels over 15m operating in the GFCM competence area (Mediterranean and Black sea)	Production
Task 1	Data on fleet segments, fishing activities, main resources, biological and socio-economic variables, catch, effort, overall by-catch	Production / dissemination
SIPAM – Production statistics	Data on aquaculture production by CWP statistical areas; culture environment; cultured species; system of culture; type of culture; capture-based aquaculture input production quantity; production value.	Production / dissemination
SIPAM – Production centers	Data on unit/segment of production; number of production centers per unit/segment; cultured species per unit; total volume (m ³) of facilities of production centers per segment; destination of product per segment	Production / dissemination

- **Database management system:** IT staff is dedicated to the system management.
- **Sharing data with other institutions:** no.

GFCM manages also other databases but those are not related to DCF.

Connection

- IT aspects: Infrastructure is outsourced, in 2 dedicated powerful servers running under windows server 2003 and 2008 R2. The current infrastructure is planned to be migrated soon in the Windows cloud solution Azure, providing data exchange mechanism based on MS Share Point. Databases hosted by GFCM are not connected among each other.



Database structure

- Task 1: is the database containing data on fleet segments, fishing activities, main resources, biological and socio-economic variables, catch, effort, overall by-catch as per GFCM recommendation GFCM/33/2009/3⁵².
See Section 3.5.3 Data upload (Formats and content) for the detail of the data and reference data implemented.
- Vessel record: is the database containing Data of all fishing vessels operating in the GFCM competence area (Mediterranean and Black sea) as per recommendation GFCM/35/2011/1⁵³.
See Section 3.5.3. Data upload (Formats and content) for the detail of the data structure and reference data implemented.
- SIPAM databases are 2 databases on aquaculture production and aquaculture centers. These databases are conducted on the basis of C#.NET and a SQL Server.

All GFCM databases are set up independently and not connected (i.e. there is no exchange of data). But they do share common reference data stored in a common reference system.

⁵² GFCM/33/2009/3 can be found here: http://151.1.154.86/gfcmwebsite/docs/RecRes/Rec_GFCM_33_2009_3.pdf

⁵³GFCM/35/2011/1 can be found here: http://151.1.154.86/gfcmwebsite/Docs/RecRes/RES-GFCM_35_2011_1.pdf

Table 81. Summary on GFCM databases

Technical requirements	
Technical trends	Ok
Connection	LAN and internet connection for the system. Not all databases are accessible from outside.
Cost : software purchase/ maintenance fees	14,000 US\$ for the cloud hosting, 3,000 US\$ of licensing cost
Interoperability with other system and web services	GFCM databases are set up independently but share the same data reference system.
Conformity to standard	Apart from ASFIS FAO species lists, GFCM is using its own classifications for area, gear type and fleet segmentation (vessel type). Mapping could be easily done to the international classification though not available.
Referential	FAO standard for species – ISO3 for CountriesFleet segmentation defined and available in GFCM website (http://www.gfcm.org/gfcm/topic/16166/en) Other classifications (Gear, Area) used are GFCM classifications.
Reusability	Data reference system is shared across databases
Updatability: resources needed, customization of the tests	No information available at that level.
Data security and access level (due to confidential data)	Confidential data such as Vessel data are only available for internal use. Production databases are not directly accessible from outside.
Follow up of user requests	By GFCM-Secretariat
Data integrity	Some data are uploaded from XML format, it should guarantee integrity.
Data storage type: relational database	Data are stored in independent databases with their own data model.
Functional requirements	
Metadata management	Data calls are available for download on the GFCM website including the description of reference data such as definition of operational units, code lists etc...
Upload	Upload is done by the GFCM data manager, mostly manually from Excel or XML files.
Automated validation	Validations are automated
User-friendliness and Easiness to use	Excel files have been set up to facilitate data reporting from countries. No additional information on the UI to upload data. Data upload and processing are done by one person.
User support	By the GFCM secretariat
Resource needed for the maintenance	GFCM staff

Aggregation level (variables and dimensions)

We first present the reference data of each database, the classification used and compare it to DCF requirements. We will then describe the type of data handled in the different databases and compared it to DCF requirements.

Reference data

Table 82. Task 1 database

Dimensions	Classification used	Comparison to DCF
Time	Year (2010, 2011 etc...)	Equal
Countries	ISO3 codes	Equal
Area	GSA (Geographical Sub Areas)	Same level of disaggregation (GSA)
Fleet segment	Vessel type combined with length	DCF has vessel size – almost identical
Gear Class	GFCM Gear group	Almost identical except tuna seiners
Fishing Gear	ISSCFG	Similar
Species	FAO ASFIS	FAO ASFIS

Table 83. Vessel record

Dimensions	Classification used	Comparison to DCF
Time	YEAR – MONTH-DAY	Equal
Countries	ISO3 codes	Equal
Area	GSA (Geographical Sub Areas)	Same level of disaggregation (GSA)
Vessel size	No classification, Length Overall in meters with a precision of 2 digits	DCF has vessel size – almost identical
Fishing Gear	ISSCFG	Similar
Mesh size	The value indicating whether the vessel belongs to the GFCM Minimum Mesh Size Vessels List (REC.GFCM/33/2009/2)	

SIPAM: no reference available.

➤ **Type of data:**

For task 1 database

1. Task 1 database: domains are described in the table below

Regarding DCF type data:

- For **Catches**, GFCM data are more aggregated than the ones requested in the Med&BS calls. There is no indication of number of catches per age or length classes. (See the task1 Excel file in Annex1, see page 18: only min, max and average length as well as overall sex ratio per species are available);

- For **Landings**: GFCM data are more aggregated than the ones requested in the Med&BS calls. There is no indication of number of landing per length classes. (See the task1 Excel file in Annex1, see page 18);
 - For **Discards**: GFCM data are more aggregated than the ones requested in the Med&BS calls. There is no indication of number of discards per age or length classes. (see the task1 Excel file in Annex1, see page 20): only total value in tons for the given species is available;
 - For **Effort**: GFCM data and DCF call are comparable;
 - Details of fishing sets per gear type are not collected by GFCM (Meds_TA and following DCF data calls);
 - No data are available for biomasses and abundance in GFCM.
2. **Vessel Record**: this database contains data on fishing vessels (>15m). It contains the list of vessels with detailed information on the vessel.
 3. **SIPAM databases**: these databases contain economic information on production centers and on cultured species. It could cover some needs in terms of DCF data for aquaculture, on production per species. Regarding SIPAM, data on aquaculture are less detailed than needed for DCF, except for production value per species.
- **Frequency of update**: data are uploaded in the database on a yearly basis for all databases.

Data processing and estimations

- **GFCM dataflow**: the Commission receives official submission of data from member countries through the data reporting tools available on the GFCM web site. Data are processed internally and statistical bulletins are produced regularly and put at disposal on the GFCM web site.
- **Estimations**: Estimates are provided by Members Countries when no actual data is available.

Interactions with other fisheries related data

No DCF data are received from EU.

Evaluation and conclusions

- **Duplications and similarities**: there is no overlap between databases.
- **Differences (in aggregation levels)**: not relevant as data hosted in the 3 databases are of different types.
- **Simplifications**

Conclusions based on preceding sub-sections:

- Connection: connection in GFCM is good and procedures are in the process of being improved.
- Structure: structure of databases could hardly be improved given that data types are drastically different. Databases are already sharing common reference data (vessel type, gear type etc.). If compared to DCF requirements, GFCM databases share common reference data classification (either same classification or a mapping is possible between reference data).
- Aggregation: aggregation level comparison to DCF data shows a higher level of aggregation in GFCM. A scenario in which DCF data are provided to GFCM by an external entity (depending on the scenario) is feasible.
- Processing: processing is highly manual but should be soon more automatized.

1.5.3. Data upload

Procedures

- GFCM recommendations (GFCM/35/2011/1 and GFCM/33/2009/3) define the Member States obligations in terms of reporting for the main databases.
- The calendar for data calls.

Table 84. List of data calls and their timing in 2011-2013

Name	Year / Month of launch	Year / Month of deadline	Type of data required	Legal basis	Frequency
Vessel record	Every year	31/03	VMS data of the previous year	GFCM/35/2011/1	Annual
Task 1	Every year	31/05	Year n-2 data	GFCM/33/2009/3	Annual
SIPAM	Every year	30/06	Year n-1 data	Databases handover to GFCM in 2008 after more than 10 years of development over several projects/programmes ⁵⁴	Annual

Formats and content

- **The type of data and aggregation level;**

See Section 3.5.2. Database set up (Database structure) for the description of the type of data and the level of aggregation.

⁵⁴ More on SIPAM origin http://www.faosipam.org/index.aspx?pag=menuitem/_SipamOrigin

See Annex 4 for the stock assessment template.

- **The transmission/upload protocols and formats, problems faced at the data provider and data recipient level:**
 - GFCM current transmission protocol is based on files sent through e-mails. This protocol has significantly evolved within the past 2 years with the implementation of XML files for reporting. The evolution will continue toward the implementation of a dedicated SSL data submission process through a dedicated SharePoint portal. Once received, data are manually uploaded in the relevant database by the GFCM data manager.
 - Member States are notified 1 to 2 months in advance of changes in the next data reporting.
 - Member States report to GFCM on time regarding transmission calendar.

Evaluation and conclusions

- **Duplications and similarities:** There are some overlapping in terms of data collection with DCF but no detailed information is collected.
- **Differences (in aggregation levels):** aggregated data at species level.
- **Simplifications:** The actual upload process is manual; automation of data upload could be foreseen with the generalization of reporting in XML files.

Conclusions

- Procedures: limitations of the current procedure have been identified and new process is being implemented to improve data upload (making it more automatic). The overall upload process could more automatized by generalizing the reporting in XML files.
- Formats and contents: format is Excel and XML for data upload. Generalization of XML should improve overall quality of data loaded.

1.5.4. Quality control - “GFCM”

Data validation

The table below describes per type of data the quality control done either manually by GFCM staff or automatically by the software.

Table 85. Summary of validation processes and quality checks in Task 1 and SIPAM databases).

Type of data	Type of check	Type of test
Stock ⁵⁵	Manual	Availability – Missing values – Duplicated records – Coefficient of variation – Sample size – Sampling rate - Typing errors – arithmetic checks – logical checks – Range / Outliers cross sections - Range / Outliers time series
	Software	Coding
Catch	Manual	
	Software	Availability – Missing values – Duplicated records – Coding - Typing errors – arithmetic checks – logical checks – Range / Outliers cross sections - Range / Outliers time series
Capacity	Manual	
	Software	Availability – Missing values – Duplicated records – Coding - Typing errors – arithmetic checks – logical checks – Range / Outliers cross sections - Range / Outliers time series
Effort	Manual	
	Software	Availability – Missing values – Duplicated records – Coding - Typing errors – arithmetic checks – logical checks – Range / Outliers cross sections - Range / Outliers time series
Fleet	Manual	
	Software	Availability – Missing values – Duplicated records – Coding - Typing errors – arithmetic checks – logical checks – Range / Outliers cross sections - Range / Outliers time series
Aquaculture (SIPAM)	Manual	
	Software	Availability – Missing values – Duplicated records – Coding - Typing errors – arithmetic checks – logical checks – Range / Outliers cross sections - Range / Outliers time series

Storage of quality indicators

No quality indicators are stored.

Evaluation and conclusions

- Data validation: data validation is highly automatic when processing the task1/SIPAM data calls.
- The quality indicators are not stored in any database.

⁵⁵ Stock assessment reports are filled by Member States based on a common template. Contents are manually checked and published as pdf files on the GFCM web site. No database is available for stocks.

1.5.5. Dissemination

Confidentiality of data

- Task1 data (Catch, landing, effort) are published.
- Aquaculture database is restricted to authorized users.
- Vessel records data are for internal use.

Restricted access (WGs + Internal staff), including confidentiality

- Main user and uses: Vessel Record, Task1 and Aquaculture data are available to authorized users.
- Accessibility: once log in, the user can access SIPAM (aquaculture) data through an advanced query tool.
For Vessel Record and Task1 database, GFCM staff can have access to the data through the LAN (intranet).
Vessel Record/List is exposed to external authorized users (a secured web service) through an internally developed tool, AVL browser (Authorized vessel list).
- Regularity of update: data are updated on a yearly basis.
- Dissemination policy + notifications: a newsletter is available for SIPAM users.
- Confidentiality: data are restricted to registered users.
- Extraction services: an advanced query tool is available for SIPAM data.

Public access

- Only some of task1 data are available through statistics bulletin accessible on the GFCM web site (<http://www.gfcm.org/gfcm/topic/17106/en>) for years 2008, 2009 and 2010. These statistics bulletins are automatically generated by a tool reading data from task1 database.
Statistics are published on a yearly basis.
Regarding DCF needs, GFCM data are n-2, a year later than expected for DCF.
- Dissemination policy and notifications: there is no active dissemination policy at GFCM level for public data.

Technical functionalities

- For SIPAM, the query tool is developed in C#.NET. The AVL tool is developed in VB.NET

Evaluation

- There are 3 user's groups for data dissemination: Internal GFCM users with full access to internal database, restricted users that have access to a set of data for professional use (Authorized vessel list for port authorities, Task1 data for scientific groups) and the general public. A 4th group can be added for the SIPAM databases, thus national

coordinators authorized to submit data to the system (actual upload is under GFCM staff responsibility).

1.5.6. Institutional considerations

Legal

- Legal basis: Established within the framework of Article XIV of the FAO Constitution. Based on an Agreement entered into force on 20 February 1952. Amended in 1963, 1976 and 1997. 22 member countries of the Mediterranean and Black Sea and the EU.
- Relation to EU legislation: none.

Administrative

- Guarantee of confidentiality: yes.

Financial

- Funding: by Member's State Contribution.
- Staff and Budget for DB development: 18 000 US\$ / year.

Evaluation

- Duplications and similarities: GFCM, under Article XIV FAO RFMO; it collecting more aggregated data on catch / landing / effort / discards than defined by DCF standard, fulfilling its mandate regarding its needs in terms of stocks assessment.
- Differences: main difference with DCF is the level of aggregation, data being collected at a higher aggregation level than DCF.
- Value added of the quality checks / validation processes: generalization of XML files and automation of quality checks brings a high added value to the current databases.
- Identification of gaps: Main gap identified here is the lack of disaggregated data regarding DCF requirements.
- Simplifications.

1.6. Other RFMOs

The RFMOs to be analysed in the course of this study were selected as stipulated by the ToR of the service contract. Basically, those RFMOs which have the EU (in the name of EU MS) as contracting party were taken into consideration for this analysis. This chapter presents a summary of the information collected from those fisheries organisations that have answered to the questionnaire up to the date of submission of the present report. These RFMOs are: NAFO, CCSBT, IATTC, ICCAT, SEAFO and SPRFMO.

IOTC, WCPFC, CCAMLR and NEAFC were contacted as well. However, in these cases the common answer was the difficulty to meet the given deadline in time due to the heavy work load during this period, where most of the committees meetings take place. In single cases, also limited human resources were given as reason for delayed or no response. As much as it was possible to the authors, information on non-responding RFMOs, particularly on IOTC as major actor in tuna fisheries, was extracted from different sources and added where relevant to the summary and annex tables.

Moreover, in the case of SEAFO, although the EU appears as contracting party to the convention, no EU vessels (i. e. Spain, Portugal) are currently active in the area.

1.6.1. Summary and conclusions

- Duplications and similarities: Most RFMO collect the same common core type of data for Fisheries management (catch/landing, effort, vessel authorized to fish). They have good technical capacity to maintain and disseminate data but are, though, limited for new development.
- Differences (in aggregation levels): Catch/landing and effort data are generally more disaggregated than DCF data, although reference data used are compliant with DCF.
- Simplifications: No real possibility for simplification has been identified by the authors through the RFMOs analysed.

Despite the small number of answers received, from a qualitative point of view, the organisation and management as well as the dedicated staff were highlighted as strength factors within the data collecting system of single RFMOs. However, it is the understanding of the authors that it is more the high dedication and engagement of individual staff members what is meant here, rather than the number of staff appointed for data collection services. On the others side, (insufficient) software, training and development possibilities were indicated as weak points.

1.6.2. Data storage and access – Other RFMOs

Overview

In a simplified way, the databases held by RFMOs are formed on one side by a vessel register, i. e. the list of vessels (of the various members states) that are authorised to operate in the fishing grounds of a certain RFMOs and, on the other, the data on catches/landings (either from logbooks or observer programmes) needed for fisheries management, often completed with data on size frequencies or weights at length, e.g. for large pelagic/tuna-like species.

Apart from SPRFMO, which has one database holding most of the data, the trend is to have one separate database per type of data managed.

Table 86. Databases – names and domains (according to responded questionnaires and other sources of information where available)

RFMO	Name of the database	Domain covered by the database	Production/ dissemination DB
CCAMLR	Catches and fishing effort	Catches and fishing effort by fishing season	At least dissemination
	Catch histories	Catch histories for selected species	At least dissemination
	Global landings and trades of toothfish	Global landings and trades of toothfish	At least dissemination
CCSBT	Estimated Total Global Catch of Southern Bluefin Tuna	Annual catch by flag or gear from 1952 to 2012 inclusive and Catch by year, month, gear, ocean and 5 degree grid from 1965 to 2012 inclusive	At least dissemination
	Catch and Effort Data	Longline Fishery (to December 2012) Surface Fishery (to December 2012)	At least dissemination
	Catch at Size Data	SBT size frequency data for commercial fishing operations, raised to the total reported SBT catch of the relevant flag state or fishing entity	At least dissemination
NAFO Northwest Atlantic Fisheries Organization	STATLANT 21 A	Annual catches by species, subareas, country, and year	Production
	STATLANT 21 B	Monthly catch and effort information by year, country, gear, tonnage, main species, Division, and year	Production
	V-Track (VTI)	VMS (Hourly position, speed and heading); Daily catch and discard by species, subarea and vessel	Production
IATTC Inter-American Tropical Tuna Commission	Purse seine observer data for tuna fishery	On-board observer programme data: Fishing activities, catch, discard and by-catch, environmental variables, compliance with resolutions.	Production
	Logbook data	Fishing log information for purse seine and bait boat gear; retained tuna catch, effort, fishing locations, environmental variables.	Production
	Unloading data	Unloading weights collected from canneries.	Production
ICCAT International Commission for the Conservation of Atlantic Tunas	Task I catch statistics	Nominal annual catch of tuna, tuna-like species and sharks, by region, gear, flag and species, and, where possible, by EEZ and High Seas. Catches reported in kilograms, round (live) weight.	Production and dissemination
	Task II catch and effort statistics	Catch (kg or number of fish) and effort statistics by area, gear, flag, species and by month.	Production and dissemination
	Task II size data	Actual size frequencies of fish sampled by area, gear, flag, species and by month and by sex if possible.	Production and dissemination
	Catch-at-size data	Catch-at-size data for bluefin, albacore, yellowfin, bigeye and skipjack tunas and swordfish, by gear, sampling area and by month or quarters, and by sex and by 5x5 degree squares if possible.	Production

	Observer data	A number of nations have observer programmes in place; the information collected from such programmes is or could be provided to ICCAT.	Production
	VMS data from BFT vessels	Vessel Monitoring Signals from fleet involved in eastern BFT fishing operations.	Production
	Conventional and electronic tagging DB	Conventional & Electronic tag-recapture information for major tuna, tuna-like species and sharks. Include special research tagging programs implemented by ICCAT: G-BYP.	Production
	Register of ICCAT vessels and IUU vessels	Active, registered and/or authorised list of vessels for different tuna fisheries: Record of vessels over 20m, carrier vessels, BFT catching vessels, SWO-MED vessels, BET/YFT Tropical vessels, Chartered vessels, and list of IUU vessels	Production
	Eastern BFT associated databases on farmed bluefin tuna	List of authorised farms, traps, ports for landing, validator and inspectors related to the Eastern Bluefin tuna fisheries.	Production
IOTC Indian Ocean Tuna Commission (information for ITOC website)	Nominal Catch	by each FAO statistical area, by species and fishing gear made by vessels flying the flag of the reporting country in live weight equivalent	At least dissemination
	Catch and Effort	catch in weight (purse seine) and/or numbers of fish (longline) of tuna and tuna-like species, preferably raised to the total nominal catch and fishing effort by month, species and gear	At least dissemination
	Size-Frequency	Length-frequency sample or raised data by species and gear are kept in the smallest practicable time/area strata. The spatial and temporal aggregation are identical to those of the catch and effort data, as are the restrictions on release	At least dissemination
	List of authorized vessel	<ul style="list-style-type: none"> List of authorized vessel over 24m LOA to operate in ITOC area 	At least dissemination
SEAFO South East Atlantic Fisheries Organization	VMS	Geographic positional data	Production
	Scientific Observer	Set-by-set data, biological sampling data	Production
	Vessel Registry	Authorised vessel list	Production
SPRFMO South Pacific Regional Fisheries Management Organisation	SPRFMO Database	Vessel details, fishing activity, observer data, landings data, VMS data, annual catches, VME areas (including seamounts), bottom fishing footprints and aggregated fishing activities	Production + Dissemination
	SPRFMO GeoDatabase	ArcGIS data repository for Seamounts, SPRFMO Areas, ESBAs, Vessel VMS tracks, Bottom footprints, aggregated catch data	Production + Dissemination
	SPRFMO list of Active Vessels CJM fishery	Fishing vessels active in CJM (Chilean Jack Mackerel) fishery, vessels involved in Transshipments, catch of CJM	Production
	Annual National Reports	Fisheries descriptions, annual catch totals, aggregated catch, effort and capacity, CPUE trends, research activities, biological samplings, observer programme summary,	Production
	Monthly Catch Reports	Monthly catches	Dissemination

Table 87. List of data requested by non-responding RFMOs – Type and domains

RFMO	Type of data requested	Domain covered by the data
CCAMLR	Catches and fishing effort	Catches and fishing effort by fishing season
	Catch histories	Catch histories for selected species
	Global landings and trades of toothfish	Global landings and trades of toothfish
NEAFC	n/a	n/a
IOTC Indian Ocean Tuna Commission (information for ITOC website)	Nominal Catch	by each FAO statistical area, by species and fishing gear made by vessels flying the flag of the reporting country in live weight equivalent
	Catch and Effort	catch in weight (purse seine) and/or numbers of fish (longline) of tuna and tuna-like species, preferably raised to the total nominal catch and fishing effort by month, species and gear
	Size-Frequency	Length-frequency sample or raised data by species and gear are kept in the smallest practicable time/area strata. The spatial and temporal aggregation are identical to those of the catch and effort data, as are the restrictions on release
	List of authorized vessel	<ul style="list-style-type: none"> List of authorized vessel over 24m LOA to operate in ITOC area
WCPFC	Annual catches	Estimates of annual catches for each gear type in metric tonnes (essentially a 'national fishery report' describing the activities of EU vessels)
	Purse seine and long line annual catch	Annual catch estimates for purse seine and long line fleets
	Active vessels list	Number of vessels for each gear type active during each year (for longline, pole-and-line vessels, and purse seiners, the number of vessels active shall be provided by GRT class)
	Catch and effort	Operational level catch and effort data or, in case of domestic legal constraints: Catch and effort data aggregated by time period and geographic area; longline data to be aggregated by periods of month and area 5°; purse-seine and ringnet data by periods of months, area 1°
	Size composition data	Length and/or weight composition at least at periods of quarter and areas of 20° longitude and 10° latitude.
	Transshipment data	Transshipment data of all highly migratory species
	Monthly catch reports	Bigeye longline monthly catch reports

In most cases, RFMOs have SQL-server databases in place, which are complemented by applications such as Oracle, Visual Studio, R, VB.net and Microsoft Excel, Access and Outlook. In the case of VMS (Vessel Monitoring System) data, ArcGIS and ArcView were used for interfacing with the databases.

Regarding the IT staff, all RFMOs stated to have dedicated workforce. IOTC, though, have only one Data Manager in charge of maintaining existing databases. Concerning the technical solutions chosen, databases are locally hosted in their local servers, except for SPRFMO which outsources its main database. Documentation is not consistently available across RFMOs.

Connection

All RFMOs have a local network and access to internet. Regarding the interoperability with other databases, half of the RFMOs have independent and not connected databases, the other half have interconnected databases. In the latter case, it is usually the vessel register (vessel ID) that is linked to the catches, to the observer data or also to the VMS coordinates.

Data base structure

The RFMOs' analysed hosted the following type of databases:

- Annual catches by species, area, country and year (CCAMLR, CCSBT, NAFO, IATTC, ICCAT, IOTC, SPRFMO, WCPFC)
- Monthly catches by species, area, country (CCSBT, NAFO, ICCAT, IOTC, SPRFMO, WCPFC)
- Effort (CCAMLR, CCSBT, ICCAT, IOTC, SPRFMO, WCPFC)
- Landings (CCAMLR, CCSBT, IATTC, SPRFMO)
- Logbook (NAFO, IATTC, ICCAT)
- Observer data (IATTC, ICCAT, SEAFO, SPRFMO)
- VMS (NAFO, ICCAT, SEAFO, SPRFMO)
- Vessel registry (ICCAT, SEAFO, SPRFMO, WCPFC)
- Environmental data: sea surface temperature, wind speed, visibility and cloud cover, etc.⁵⁶ (IATTC, IOTC on CD, SPRFMO,)
- Size Frequency (IATTC, ICCAT, IOTC, WCPFC)

⁵⁶ No connection could be observed so far between the environmental data collected by RFMOs and the environmental indicators addressed by DCF.

Table 88. Domains covered by the various RFMOs’ databases (according to responded questionnaires and other sources of information).

RFMO	Name of the database	Domain covered (type of data)					
		Biological – stock-related	Biological – métier-related	Catch / landings	Capacity	Effort	Environmental
CCAMLR	Catches and fishing effort			X			
	Catch histories			X			
	Global landings and trades of toothfish			X			
CCSBT	Estimated Total Global Catch of Southern Bluefin Tuna			X			
	Catch and Effort Data			X			
	Catch at Size Data			X			
NAFO	STATLANT 21 A			X	X	X	
	STATLANT 21 B			X		X	
	V-Track (VTI)						
NEAFC							
IATTC	Purse seine observer data for tuna fishery	X		X	X	X	X
	Logbook data	X		X	X	X	X
	Unloading data	X		X	X	X	X
ICCAT	Task I			X			
	Task II	X		X		X	
IOTC							
SEAFO	VMS						
	Scientific Observer	(X)		(X)			(X)
	Vessel Registry			(X)	(X)	(X)	
SPRFMO	SPRFMO DB	X	X	X	X	X	X
	GeoDatabase	n/s	n/s	n/s	n/s	n/s	n/s
	Monthly catch reports	n/s	n/s	(X)	n/s	n/s	n/s
WCPFC	Not known		(X)	(X)		(X)	

While most RFMOs indicated to be storing biological – stock-related data, métier-related data was collected only in the case of SPRFMO.

In general terms, it seems that no economic variables for fleet, aquaculture enterprises and processing industry (according to DCF understanding) are collected by RFMOs.

RFMOs indicated to be using FAO ASFIS species / 3-alpha code, gear either with their own classification or the international one, area mappable to DCF also in single cases.

Aggregation level (variables and dimensions)

As mentioned before, the type of data collected by the various RFMOs for their respective convention area comparable in general terms for their variables and dimensions (tables 16 and 17 of Annex 2.5.). However, each RFMO has refined the data needs according to their specific fisheries and their uses. Consequently, differences are observed not only in the target species reported, but also in specific variables (e.g. total or retained catch, landings, etc.) and in single cases also in their dimensions (e.g. tonnes or kg). Not always comparable are also effort variables, which vary from one gear to the other but also within gear types (fishing hours, fishing days, number of hauls, number of hooks, etc.). With regard to the fishing gears, RFMOs apply a similar classification at gear group level, but only some of them are compliant with an aggregation at gear type level (Level 4 of the matrix in Appendix IV of the DCF Regulation). Only in the case of ICCAT a more detailed classification of gear types has been developed for their specific fisheries.

Data processing and estimations

Most RFMOs analysed have stated to receive the data (either from member states, at-sea observers, field personnel, etc.) by email in form of Excel or Access files, after which they upload them manually or automatically to the respective databases. ICCAT, for example, has indicated to provide special e-forms that are completed by the EU member states and submitted to the EU (DG MARE), who forwards the forms to ICCAT without any manipulation or intervention.

In the case of SEAFO, data is imported in an automated way by using a VB.net application. Besides, IATTC has indicated to do some automated uploading apart from the manual feeding. ICCAT makes use of special programmes prepared to read standard forms, validate the data and integrate them directly in the database. For SPRFMO, having an external database, the data provider is able to upload directly the data into the database through an automated procedure. In none of the cases data is transmitted in a secured way.

Afterwards, validation processes are conducted (manually or by software) in order to check for errors, missing values, etc. (for details on the quality checks, see also table 8 of Annex 2.5.). Only in one case (IATTC), some pre-processing of the data is already done at the earliest stage by the field personnel.

Dissemination of data occurs either per email or by running queries on the access databases.

Interactions with other fisheries related data

According to the questionnaires answered, no relationship has been observed between the RFMOs' databases and any database related to DCF. However, it is very likely that EU MS, in their reporting obligations towards RFMOs, transmit data (catches, effort, etc.) that has previously been collected under the data collection framework. Since the aggregation levels differ between DCF and other RFMOs (possibly also among RFMOs), some processing of the data will be required.

As assumed, RFMOs have stated to have no relation or obligation with any other legislation that comes under EU (i.e. Control Regulation, Eurostat, MSFD, IMP).

Evaluation and conclusions

- Duplications and similarities: There is no duplication of databases in RFMOs; given limited capacities, databases are developed for the institution's specific needs. Dedicated IT staff plays a major role for an efficient update and maintenance of existing databases and systems, connectivity to exchange data (reception and publication of data) is good. Main data type for fisheries management are collected, with similar reference data, compliant with DCF.
- Differences (in aggregation levels): Some differences are observed across RFMOs, particularly with regard to some variables and their dimensions (catches/landings, effort, gear type/gear group, etc.).

Conclusions based on preceding sub-sections:

- Connection: connection is good across RFMOs
- Structure: data structure for the main data for fisheries management is similar
- Aggregation: aggregation for the main data for fisheries management is similar
- Processing: workflow is similar among RFMOs, receiving answers from Member States as Excel or Access files by e-mail in time regarding data calls' agenda; RFMO IT staff or data manager usually load data manually in the database.

1.6.3. Data upload – Other RFMOs

Procedures

The number of data calls performed varies from 1 for NAFO (which reuses FAO data from the questionnaires) to more than 100 calls for ICCAT. The predominant data calls are those concerning biological data and effort regimes.

As outlined before (Section 1.2.5), the RFMOs consulted perform the upload of data both manually as well as through automated procedures. Four out of 6 RFMOs, IATTC, ICCAT, SEAFO

and SPRFMO have stated to do an automated uploading, while NAFO does feed the database manually and IATTC does combine this with the automated procedure. In the case of SEAFO, data is imported from Excel files through a VB.net application. No automated procedure is used, though, for following the progress of data submission.

Formats and content

- For the type of data and aggregation level see section 1.6.2 (database structure and aggregation level) as structures are shared;
- For the transmission/upload protocols and formats, problems are faced at the data provider and data recipient level;

In all cases reported (we also include here CCAMLR and IOTC), data is submitted to the RFMOs by e-mail (in Excel or Access format files); no secured transmission is applied during submission, though.

For EU member states, data is first submitted to DG MARE within fixed deadlines, and DG MARE, after having compiled all relevant data, forwards the data sets to the relevant RFMO. Accordingly, no data seems to be submitted directly from EU MS to RFMOs. In some cases (ICCAT), MS are consulted directly by the RFMO in case clarifications are needed.

Evaluation and conclusions

- Duplications and similarities: workflow is similar for the various RFMOs, based on Excel or access files received from MS with the data and being manually uploaded in the databases.
- Differences (in aggregation levels): see data structure conclusion.
- Simplifications: with a common format based on XML adopted to collect data from MS for catch and effort, upload procedures would be easier to conduct at RFMO's level.

Conclusions:

- Procedures: procedures, even though highly manual, are well under control;
- Formats and contents: see section 1.2.7 for conclusion on format and contents.

1.6.4. Quality control – Other RFMOs

Data validation

As related to the data validation, most RFMOs have indicated to conduct both manual and software quality checks on their databases. Validation processes in relation to availability and accessibility of data and timeliness of data submission are usually performed manually. By contrast, those checks focusing on missing values, duplicated records, coding, typing errors, arithmetic checks, logical checks and range/outliers are generally realised by means of software tools.

Storage of quality indicators

Only three out of six RFMOs, IATTC, ICCAT and SPRFMO, have indicated to be storing some (or partly all) quality indicators on both primary and aggregated data. These concern mainly the biological data (stock- and métier-related where appropriate), catch and landings, capacity and effort and environmental data.

1.6.5. Dissemination – Other RFMOs

Confidentiality of data

Most RFMOs have stated to store confidential data (especially vessel register, logbook and VMS data) that are accessible only to internal staff or special user groups such as Scientific Committees' members through either the network or registration. On the other side, information and data on catch are usually accessible to the general public.

Restricted access (WGs + internal staff), including confidentiality

- Main user and uses: 3 user groups are to be considered: internal staff, special user groups, i. e. the members of the Scientific Council /General Council (NAFO) or the Scientific Committee (SPRFMO), with special access right, and the general public.
- Accessibility: Access to data required authentication through login and password in most cases.
- Regularity of update: Database updates varies upon the nature of the database, it is mostly done annually or ad-hoc.
- Dissemination policy + notifications: Only ICCAT and SPRFMO have an active dissemination policy with newsletters / e-mails for special user groups.
- Confidentiality: Confidential data are accessible to internal staff and special user groups.
- Extraction services (q.9) / queries: Dynamic filter are available for internal staff and special user group.

Public access

- SEAFO, as only fisheries organisation, does not make data available to the general public; data are for internal use.
- Accessibility: Data are accessible for general public through simple Excel (CCSBT, CCAMLR, NAFO, IATTC, ICCAT and IOTC) or through on-line query tools (SPRFMO).
- Regularity of updates: Database updates vary upon the nature of the database, mostly annually or ad-hoc.
- Dissemination policy and notifications: Only ICCAT and SPRFMO have indicated to have an active dissemination policy with newsletters / e-mails for the general public.
- Extraction services / queries: For NAFO, ICCAT and SPRFMO databases are accessible by web-services. Ad-hoc requests can also be sent to the database manager.

No information is available for the other fisheries organisations.

Technical functionalities

Information is available only for NAFO and SPRFMO.

- Software used for accessing the DB: Mainly Microsoft based solutions are in place: ACCESS for NAFO, a SQL 2008 database with an ASP.NET application.
- Access through internet: Databases are available on NAFO, ICCAT and SPRMFO websites.
- Configuration: Also web services are available for the three RFMOs.

Evaluation

- Duplications and similarities: All RFMO have a restricted access to data needed for scientific advices either through direct internal access to the DB (RFMO staff) or through secured login system. Surprisingly enough, aggregated data are not always made public. When available, they are usually available as simple Excel files.
- Users and uses: Same user groups are present for all RFMO with similar types of access: internal users have access to all data, special user group such as scientific committees has access to a group of disaggregated data and the general public has access but not always to aggregated data.

1.6.6. Institutional considerations - RFMOs

Legal

Table 89. Legal basis

RFMO	Legal basis	Relationship to EU
CCAMLR	The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) was established by international convention in 1982 with the objective of conserving Antarctic marine life. (http://www.ccamlr.org/en/organisation/camlr-convention)	EU is a contracting party
CCSBT	Convention for the Conservation of Southern Bluefin Tuna (http://www.ccsbt.org/userfiles/file/docs_english/basic_documents/convention.pdf)	The EU has signed up as a http://www.ccsbt.org/userfiles/file/docs_english/basic_documents/Resolution_To_Establish_CooperatingNonMember_Status.pdf
NAFO	An international organizations with the capacities of a body corporate in Canada (Northwest Atlantic Fisheries Organization Privileges and Immunities Order/Décret sur les privilèges et immunités de l'Organisation des pêches de l'Atlantique nord-ouest. P.C. 1980-132 January 11, 1980)	EU is a contracting party
NEAFC		
IATTC	The 2003 Antigua Convention (short for the Convention for the Strengthening of the Inter-American Tropical Tuna Commission established by the 1949 Convention between the United States of America and the Republic of Costa Rica http://www.iatc.org/PDFFiles2/Antigua_Convention_Jun_2003.pdf	EU is a contracting party
ICCAT	International Convention for the Conservation of Atlantic Tunas signed in Rio de Janeiro in 1966 (entered in force in 1969) http://www.iccat.int/Documents/Commission/BasicTexts.pdf	EU is a contracting party
IOTC	Commission set up under Article XIV of the Constitution of the Food and Agriculture Organization of the United Nations	
SEAFO	Convention on the Conservation and Management of Fishery Resources in the South East Atlantic Ocean (2001) http://www.seafo.org/pdf/SEAFO%20Convention.pdf	EU is a contracting party
SPRFMO	The Convention on the Conservation and Management of High Seas Fishery Resources in the South Pacific Ocean http://www.southpacificrfmo.org/assets/Convention-and-Final-Act/2353205-v2-SPRFMOConvention-textascorrectedApril2010aftersignatureinFebruary2010forcertificationApril2010.pdf	EU is a contracting party
WCPFC	Convention on the Conservation and Management of High Migratory Fish Stocks in the Western and Central Pacific Ocean http://www.wcpfc.int/convention-text	EU is a contracting party

Administrative

- Guarantee of confidentiality: For most RFMO, statutes include provisions for confidentiality.
- Adaptation of statutes in relation to confidentiality: No precise evaluation is available for adaptation of statutes for confidentiality.

Financial

- Funding: Funding for RFMO is from Member's states contributions, IATTC having additional budget from supra-national organization.
- Staff and Budget for DB development: As stated previously, most RFMOs have their own IT staff, NAFO and ICCAT can also mobilise external resources, SPRFMO relies to a large extend on external resources. NAFO and ICCAT also have a dedicated budget for DB development, something that other RFMO don't have. Budget available shows an average of 30,000 euro for DB development (infrastructure, software license fees, IT maintenance, Staff training).

1.7. Regional Sea Conventions

1.7.1. Summary

1.7.1.1. HELCOM

The Baltic Marine Environment Protection Commission –(Helsinki Commission = HELCOM) is the governing body of the Convention on the Protection of the Marine Environment of the Baltic Sea Area, known as the Helsinki Convention.

HELCOM hosts 10 general marine /maritime databases containing environmental data. DCF-data are not hosted in internal databases, but a close collaboration with ICES exists via MoU and database maintenance. Some projects dealing with Baltic Sea fish coastal communities, anadromous fish and red list species have been led or are led by HELCOM. The Baltic Fisheries and Environmental Forum have been established by HELCOM to provide a platform for discussion between the fisheries and environmental authorities, as well as other stakeholders.

HELCOM has IT staff and experience with 10 environmental databases hosted internally or externally in varying complexities from Excel, MS Access and MS SQL Server. A centralized visualization end point, HELCOM Map and Data Service, provides extractions (=data products) derived from all other databases. The monitoring data are openly accessible online via web services or downloading functionality using common standards.

According to HELCOM's principles of Data and Information Strategy relevant quality control and data validation procedures should be implemented in the information-management system.

HELCOM is currently preparing together with ICES a joint VMS data call (planning to use ICES' FishFrame format) in order to support ICES/HELCOM advice on spatial distribution, impact of fisheries, pressures to the marine environment and needs for maritime spatial planning purposes.

HELCOM is bound to the EU-legislation of DCF, MSFD and IMP and, accordingly, data confidentiality is to be expected.

1.7.1.2. OSPAR

The main purpose of OSPAR Commission is to protect and conserve the Northeast Atlantic and its resources. The focus of their work is on environmental data, and OSPAR is experienced in environmental data handling and its distribution to their contracting parties, which are its main funding source.

Some of these environmental databases are hosted internally and some externally, for example at the ICES Secretariat. ICES and OSPAR share a Memorandum of Understanding (MoU 1999) and ICES provides as data centre facilities for, the validation of that data in cooperation with Contracting Parties concerned, and the transfer of that data onto suitable information-technology equipment. OSPAR has one in-house IT staff maintaining and developing the database and an IT budget of approximately 15,000€ per year.

The Quality Status Report for the Northeast Atlantic (2010)⁵⁷ considered chapters analysing e.g. “marine resources, other human uses, protection, conservation of biodiversity and ecosystems and ecosystem assessment”. Data sources mentioned in these sections were: a) for fisheries landing data in the OSPAR regions the “Statlant” database (ICES/FAO/Eurostat) and b) for the description of the assessment status of most fish stocks in OSPAR regions, “ICES”.

Ecological Quality Objectives (EcoQOs) follow an indicator-based assessment approach. Necessary data for relevant EcoQOs, which are i) spawning stock biomass of commercial fish species and ii) size structure = the proportion (by weight) of large fish in the demersal fish community; are both referring to ICES data. The EcoQO for large fish is tightly coupled to IBTS quarter 1 survey which is explicitly DCF funded.

OSPAR is bound to MSFD legislation, OSPAR is not bound to DCF regulation and the data confidentiality is not guaranteed. To change this would take more than 12 month.

To account for already existing monitoring programs (e.g. at least partly DCF-financed Bottom and Beam Trawl Fisheries Surveys), specific requests are given to ICES (and its expert Working Groups) to evaluate data availability for specific MSFD criteria like “biodiversity”.

In summary OSPAR does not hold any DCF specific database.

⁵⁷ <http://qsr2010.ospar.org/en/index.html>

1.7.1.3. Barcelona Convention

In 1975, 16 Mediterranean countries and the European Community adopted the Mediterranean Action Plan (MAP), the first-ever Regional Seas Programme under UNEP's umbrella. In 1976 these Parties adopted the Convention for the Protection of the Mediterranean Sea Against Pollution (“Barcelona Convention”⁵⁸).

The “Barcelona Convention” is one of several Regional Seas Conventions (RSCs) which all fall under the umbrella of the United Nations system.

The Convention's main objectives are:

- to assess and control marine pollution
- to ensure sustainable management of natural marine and coastal resources;
- to integrate the environment in social and economic development;
- to protect the marine environment and coastal zones through prevention and reduction of pollution, and as far as possible, elimination of pollution, whether land or sea-based;
- to protect the natural and cultural heritage;
- to strengthen solidarity among Mediterranean coastal States;
- to contribute to improvement of the quality of life.

Summary and conclusions

- The Barcelona Convention does not collect any DCF-related data. In fact, they do not collect any data even loosely related to fisheries.
- Fisheries data for the region are all handled by GFCM

1.7.1.4. Bucharest Convention

The Commission on the Protection of the Black Sea Against Pollution (the Black Sea Commission or BSC) via its Permanent Secretariat is the intergovernmental body established in implementation of the Convention on the Protection of the Black Sea Against Pollution (Bucharest Convention⁵⁹), its Protocols and the Strategic Action Plan for the Environmental Protection and Rehabilitation of the Black Sea (latest version adopted in 2009)

The “Bucharest Convention” is one of several Regional Seas Conventions (RSCs) which all fall under the umbrella of the United Nations system.

- The Bucharest Convention does not collect any DCF-related data.

⁵⁸ <http://www.unepmap.org/index.php?module=content2&catid=001001004>

⁵⁹ http://www.blacksea-commission.org/_convention.asp

- The Bucharest Convention collects some ad hoc fisheries data for their Advisory Group on Fisheries, which is transmitted every year by each country, but serves only for national or regional reporting and is not stored in any database.
- They have three of databases related to marine pollution, which have been developed externally.

1.7.2. Data Storage and Access

1.7.2.1. HELCOM

Overview

HELCOM hosts 10 environmental databases (table 90). All HELCOM hosted databases contain general marine / maritime data. No detailed information is provided if the environmental databases are for production, dissemination or a combination of both types. HELCOM also hosts one dissemination database, HELCOM Map and Data Service, only for this database is more details available.

Table 90. Environmental databases hosted at HELCOM. The centralized dissemination database HELCOM Map and Data Service provides data extractions derived from all other data databases.

Name of the database	Domain covered by the database : ENVIRONMENT	Production / Dissemination database
HELCOM Map and Data Service	visualization end point providing data products from all databases	Dissemination
COMBINE (Cooperative Monitoring of the Baltic Marine Environment) database	Oceanographic measurements, hazardous substances concentrations in biota, seawater and sediment	
PLC (Compilation of Waterborne Pollution Load) database	Waterborne nutrient and hazardous substances loading	
MORS environmental database	Radioactivity concentrations in biota, seawater and sediment	
MORS discharges database	Radioactivity discharges	
RED LIST database	Information about endangered species status and distribution	
Baltic Sea Protected Areas (BSPA) database	Information about protected area location, status and management.	
HELCOM/ASCOBANS Harbour porpoise database	Harbour porpoise opportunistic sightings, strandings and bycatches	
HELCOM AIS shipping traffic database	AIS shipping traffic statistics and vessel movements	
HELCOM shipping accidents database	Shipping accidents in the Baltic Sea reported by HELCOM contracting parties	
HELCOM illegal oil discharges database	Illegal oil discharges observed in aerial surveillance in the Baltic Sea reported by HELCOM contracting parties	

Source: Study survey

In total, two IT staff are available. One ICT Administrator managing the ICT infrastructure and one Data administrator managing the databases. Other staff also contributes to reporting practicalities etc.

The different databases are internally or externally hosted and management systems are either using Excel (n=1), Access (n=7) or SQL Server (n=2) (table 91).

Table 91. HELCOM databases: hosting locations, current and planned DB management systems

DB			
Name (Acronym)	hosting internal/external	Current Management system	Planned Management system
COMBINE	External	MS SQL Server	
PLC	External	MS Access	MS SQL Server
MORS Env.	Internal	MS Access	MS SQL Server
MORS Dis.	External	MS Access	
RED LIST	Internal	MS Access	MS SQL Server
BSPA	Internal	MS Access	MS SQL Server
Harbour porpoise	Internal	MS Access	MS SQL Server
AIS	External	SQL*	
Shipping accidents	*	Excel	MS SQL Server
Illegal oil discharges	*	MS Access	MS SQL Server
HELCOM Map and Data Service	*	MS SQL Server 2012	

*SQL not further specified

Source: Study survey

The databases are not connected with each other but a centralized visualization end point, HELCOM Map and Data Service⁶⁰ provides extractions (=data products) derived from all the DBs.

HELCOM is sharing information with other institutions. With an ArcGIS Server connected to a REST interface and an OGC WMS⁶¹ interface to access data in geographic format.

Data is received from data providers on a regular (annual) basis for the following databases: COMBINE, PLC, MORS, Shipping accident and Illegal oil discharge. Other data is obtained at irregular intervals, on ad hoc basis: RED LIST, BSPA, Harbour porpoise, AIS.

The data is entered directly using specific application (BSPA and Illegal oil discharges databases) or is received in specific formats from the data providers (for all other databases) and entered into the systems.

⁶⁰ <http://maps.helcom.fi/website/mapservice/index.html>

⁶¹ <http://www.opengeospatial.org/standards/wms>

Table 92. HELCOM databases: Update interval and data reception.

Database Name (Acronym)	Update interval		Data reception	
	annually	Irregular & ad hoc	Receive data	Direct input in DB
COMBINE	yes		yes	
PLC	yes		Yes	
MORS Env.	yes		Yes	
MORS Dis.	yes		Yes	
RED LIST		yes	yes	
BSPA		yes		yes
Harbour porpoise		Yes	yes	
AIS		yes	yes	
Shipping accidents	yes		yes	
Illegal oil discharges	yes			yes
HELCOM Map and Data Service		Ad hoc		

Source: Study survey

Connection

No more specific details listed for all ten environmental databases as provided in tables 90-91 above.

Database structure

No more specific details listed for all ten environmental databases as provided in tables 90-91 above.

Aggregation level (variables and dimensions)

Not of relevance for environmental data databases.

Data processing and estimations

Not of relevance for environmental databases.

Interactions with other fisheries related data

The Baltic Fisheries and Environmental Forum have been established by HELCOM to provide a platform for discussion between the fisheries and environmental authorities, as well as other stakeholders. “It shall ensure that all sectors concerned take and share responsibility for their impacts on the quality of the marine environment. The Forum also aims to build up a cross-sectorial integration of environmental and fisheries policies, and to identify what further steps may be needed for this purpose.”⁶²

⁶² Source: HELCOM website: <http://helcom.fi/helcom-at-work/groups/fish-env-forum>

HELCOM is involved in projects related to fish assessment and habitat restoration of species with and without commercial relevance:

- HELCOM FISH-PRO II (Project for Baltic-wide assessment of coastal fish communities in support of an ecosystem-based management)⁶³
The project considers especially the coastal fish community, which constitute an imperative part of the Baltic Sea total biodiversity and has a structuring role in coastal food webs. Coastal fisheries are also important to the society from both a socio-economic and a cultural point of view, especially as a large part of the fish fauna constitutes of freshwater fish species which are managed at national levels.
- HELCOM developed a manual on indicator based assessment of coastal fish community status in the Baltic Sea (2005-2009)⁶⁴. Many coastal species are not targeted by commercial fisheries and are not covered by DCF.
- HELCOM supports assessment of salmon (*Salmo salar*), which is included in DCF regulation, and sea trout (*Salmo trutta*) populations and habitats in rivers flowing to the Baltic Sea⁶⁵. (This project has been performed with support of DG MARE and ICES). Abundance of sea trout parr and spawners are proposed as HELCOM Core indicator for biodiversity⁶⁶ (in cooperation with ICES).

Evaluation and conclusions

HELCOM has IT staff and experience, with 10 environmental databases hosted internally or externally in varying complexities from Excel, MS Access and MS SQL Server. DCF data are not hosted in internal databases. A centralized visualization end point, HELCOM Map and Data Service provides extractions (=data products) derived from all the databases. Other Projects on Baltic Sea fish and alternative coastal fisheries assessment methods deal to a large extend with species outside of DCF, but cover also species involved in DCF (e.g. salmon). These projects are frequently in cooperation with other institutions like ICES or DG MARE.

1.7.2.2. OSPAR

Overview

OSPAR hosts database related to e.g. environment, radioactivity, pollution, marine protected areas, offshore windfarms and others (see table 93). Some fish data are included in the database of the Coordinated Environmental Monitoring Programme (CEMP) and in the Marine Protected Area Network (MPA). OSPAR does not host databases relevant to DCF.

⁶³ <http://helcom.fi/helcom-at-work/projects/fish-pro>

⁶⁴ <http://helcom.fi/Lists/Publications/BSEP131.pdf>

⁶⁵ <http://helcom.fi/Lists/Publications/BSEP126A.pdf>;

⁶⁶ http://www.helcom.fi/Core%20Indicators/HELCOM-CoreIndicator-Abundance_of_sea_trout_spawners_and_parr.pdf

Table 93. Overview from OSPAR website⁶⁷ on latest data collected as part of the on-going monitoring work carried out in the OSPAR Maritime Area

Database	Abstract	Contact Organisation	Supplementary Information (LINK)	Contains Fish data
Comprehensive Study on Riverine Inputs and Direct Discharges (RID)	Monitoring of riverborne and direct inputs of selected pollutants to Convention Water	Norwegian Insitute for Agricultural and Environmental Research (BIOFORSK)	Latest RID report and data	no
Coordinated Atmospheric Monitoring Programme (CAMP)	Monitoring the concentrations of selected contaminants in precipitation and air and their deposition around the North Sea and the North-East Atlantic	Norwegian Institute for Air Research (NILU)	Latest CAMP report and data	no
Coordinated Environmental Monitoring Programme (CEMP)	Monitoring of the concentrations and effects of selected contaminants and nutrients in the marine environment	International Council for the Exploration of the Seas (ICES)	Latest CEMP report Data used in the latest CEMP report Shapefiles used in the latest CEMP report http://dome.ices.dk/osparmime/main.html	-Yes- Fish - and Biopollution data
Discharges of Radionuclides from the non-nuclear sectors	Values from discharge monitoring	OSPAR Commission	Latest non-nuclear report	no
Discharges, Spills and Emissions From Offshore Oil and Gas Installations	Details of offshore discharges	OSPAR Commission	Latest discharges, spills and emissons from offshore oil and gas installations report	no
Dumping of Wastes or Other Matter at Sea	Spreadsheet containing the details of dumping events	OSPAR Commission	Latest dumping of wastes or other matter at sea report	no
Encounters with Dumped Chemical and Conventional Munitions	Shapefile outlining locations of encounters with munitions	OSPAR Commission	Historic dumpsite report Munitions encounters assessment sheet	no
Environmental Monitoring of Radioactive Substances	Environmental Monitoring of Radioactive Substances	OSPAR Commission	Not presented	No information available
Inventory of Offshore Installations	Details of offshore installations	OSPAR Commission	Latest inventory of offshore installations report Latest inventory of offshore installations (excel file)	no
Liquid Discharges from Nuclear Installations	Liquid discharges from nuclear installations - Values from discharge monitoring	OSPAR Commission	Latest liquid discharges from nuclear installations report	no

⁶⁷ http://www.ospar.org/content/content.asp?menu=01511400000000_000000_000000

Marine Protected Areas Network (MPA)	Database outlining protected marine areas. The German Federal Agency for Nature Conservation (Bundesamt für Naturschutz, BfN) manages this dataset	OSPAR Commission	2012 status report on the OSPAR network of marine protected areas	Yes Some on e.g. red list species
Mercury Losses from the Chlor-alkali Industry	Details of Mercury from chlor-alkali monitoring	OSPAR Commission	Latest mercury losses from the chlor-alkali industry report	no
Offshore Wind-farms	Details of wind-farms in the OSPAR area	OSPAR Commission	Latest wind-farm report	no
OSPAR Habitats in the North-East Atlantic Ocean	Point and polygon layers showing distribution and extent of threatened and/or declining habitats in the OSPAR area.	Joint Nature Conservation Committee	Mapping European seabed habitats interactive map Mapping European seabed habitats WMS Link Dataset last updated March 2013. Data available to download either as an ESRI File Geodatabase or as ESRI Shapefiles.	no
OSPAR Boundary - Shapefile	A polyline shapefile containing the external boundary and internal region boundary lines to describe the OSPAR area.	OSPAR Commission	OSPAR Boundary - Shapefile	no
OSPAR Boundary - Maritime Area	A polygon shapefile describing the OSPAR maritime area.	OSPAR Commission	OSPAR Maritime Area - Shapefile	no

Source: OSPAR website – modified for survey study

Data sharing with other institutions exists, for example with ICES:

There is a close interaction of OSPAR with ICES, both sharing a Memorandum of Understanding (MoU).

The ICES Secretariat serves as data centre for data collected under the Co-ordinated Environmental Monitoring Programme ("CEMP") under the OSPAR Joint Assessment and Monitoring Programme ("JAMP").

OSPAR has requested⁶⁸ ICES to evaluate and maximize the use of available sources of data for monitoring of biodiversity. Specifically the ICES Working Groups International Bottom Trawl Survey (WGIBTS), and Beam Trawl Survey (WGBTs) have been asked to elaborate potential contributions of the WGs to the reporting under the MSFD, specifically with regard to biodiversity-related indicators⁶⁹. "(...) detect efficiencies which could be made to identify where there are monitoring programmes or data sources that can deliver multiple indicators, which may

⁶⁸ OSPAR Request-ID to ICES (2013-4)

⁶⁹ Tables A.8.1 and A.8.2 in Annex 8

<http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/SSGESST/2013/IBTSWG13.pdf>; p.142ff).

relate to different descriptors, (e.g. The Data Collection Framework could be used to implement MSFD D3 and D1 indicators), or where with a small additional effort existing monitoring could be amplified to deliver a broader set of data.”

OSPAR Core Indicators & MSRL Indicator

1. Population abundance/biomass of a suite of selected species
2. OSPAR EcoQO for proportion of large fish (LFI)
3. Mean maximum length of demersal fish and elasmobranchs
4. Changes in average trophic level of marine predators (cf MTI)

The ICES WG mentioned necessary improvements during the surveys needed to be done in each covered area, to meet the criteria for each respective MSFD indicator⁷⁰.

Connection

Not relevant because OSPAR does not hold any DCF related databases

Database structure

Not relevant because OSPAR does not hold any DCF related databases.

Aggregation level

OSPAR does not host any DCF relevant database, therefore no domains or potential aggregation levels available.

Data processing and estimations

OSPAR does not do any processing or estimations in relation to fisheries.

Interactions with other fisheries related data

Here is a close interaction of OSPAR with ICES, both sharing a Memorandum of Understanding (MoU). See Section 3.7.2.2. OSPAR (sharing data with other institutions).

Evaluation and conclusions

OSPAR does not hold any DCF relevant database. Therefore, there are no duplications or similarities with other institutions in relation to this kind of data. Specific requests, like the evaluation of potentially available monitoring programs or data in relation to MSFD

⁷⁰ A.8.2 in Annex 8

<http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/SSGESST/2013/IBTSWG13.pdf> ; p.142ff

commitments, are raised to ICES. This makes sense, as ICES hosts the relevant expertise within their Working Groups, and ICES maintains the necessary data infrastructure.

1.7.2.3. Barcelona Convention

Overview

The Barcelona Convention does not collect any DCF-related data. In fact, they do not collect any data even loosely related to fisheries.

There is no fisheries data stored by the Barcelona Convention, but they do obtain some ad hoc data related to fisheries from GFCM, for specific purposes, but this data is not stored in any formal way.

Connection

There is no dedicated IT/DB staff within the Barcelona Convention.

Data base structure

Not applicable.

Aggregation level (variables and dimensions)

Not applicable.

Data processing and estimations

Not applicable.

Interactions with other fisheries related data

As mentioned, the Barcelona Convention receives some ad hoc fisheries data from GFCM, for specific purposes like working parties or defining indicators and objectives, but no data is actually stored and/or managed locally.

Evaluation and conclusions

- Since The Barcelona Convention does not collect, store or manage fisheries-related data, it is not relevant to the DC-MAP context.

1.7.2.4. Bucharest Convention

Overview

- The Bucharest Convention does not collect any DCF-related data. In fact, they do not collect any data even loosely related to fisheries.
- There is no fisheries data stored by the Bucharest Convention, but they do maintain three databases related to marine pollution and plankton, which have been developed externally:

- Black Sea Information System (BSIS)⁷¹: The Black Sea Information System was designed in framework of the GEF Black Sea Ecosystem Recovery Project (BSERP) for implementation of the Information Strategy of the Black Sea Commission.

Data flow within BSIS is organized in a following way:

1. Advisory Groups Focal Points in Black Sea countries enter data in standardized format and send or upload it to the Secretariat.
 2. Secretariat staff makes necessary arrangements to ensure the import of received data to central database.
 3. Output data from central database available to BSIS users by using a WEB application, online access to the BSIS for registered users only.
- Mnemiopsis data-base⁷²: The database provides a possibility to analyze in details the spatial distribution and the variability at different time scales of the invasive ctenophore species (*Mnemiopsis leidyi*) from the time of its invasion into the Black Sea till nowadays.
 - Black Sea Phytoplankton checklist⁷³: an online list of Black Sea phytoplankton.

Connection

The Bucharest Convention has no dedicated IT/DB staff and the databases are fed on an ad hoc basis by general service staff.

Data base structure

Not applicable

Aggregation level (variables and dimensions)

Not applicable

⁷¹ http://www.blacksea-commission.org/_bsis-description.asp Note: the BSIS seems to be offline since an indeterminate time.

⁷² <http://bscps.ma.cx:88/MLDB/Default.aspx> Note: it seems the database has not been updated since 2010.

⁷³ <http://phyto.bss.ibss.org.ua/wiki/Category:Species>. Note: the list has been last updated in 2011.

Data processing and estimations

Not applicable

Interactions with other fisheries related data

Not applicable

Evaluation and conclusions

Since The Bucharest Convention does not collect, store or manage fisheries-related data, it is not relevant to the DC-MAP context.

1.7.3. Data Upload

1.7.3.1. HELCOM

Procedures

One data call has been planned to be launched in October 2013 through a joint initiative with ICES and HELCOM for effort data (VMS data that record the position/speed etc. of the vessel). The final call text has not been provided to clarify dates, types of data required, legal basis etc., but the rationale has been described by correspondence with the HELCOM Secretary⁷⁴.

⁷⁴ SOURCE: email communication (11/4/2013) with Mr Mikhail Durkin, Professional Secretary, Helsinki Commission mikhail.durkin@helcom.fi

The rationale for the joint ICES/HELCOM Data Call is as follows:

“ICES has a standing request from the European Commission to advise and inform on the impacts of fisheries on the marine environment. Currently it provides advice on the impact of fishing on birds and mammals. It is required to expand this advice to the impact on benthic habitats. The DCF makes it a requirement to report on spatial fishing activities in relation to habitat (indicators 5, 6 and 7 of Annex XIII to Commission Decision (2010/93/EU)) and ICES is requested by the Commission to provide these indicators. VMS data from vessels is currently the most practical and cost-effective way to describe the spatial dynamics of fishing activities. ICES is thus mandated to request VMS information, at high resolution (spatial and temporal) to provide this advice. This mandate is supported by the current EU data collection framework (DCF) and the Aarhus Convention (2001).

HELCOM is the marine management organization for the Baltic Sea and it underpins its actions through scientific advice. EU Member States utilize HELCOM assessments to implement the EU Marine Strategy Framework Directive. HELCOM together with VASAB (ministries responsible for spatial planning) also reconciles maritime spatial planning needs, including shipping, wind farms and fishing. Compared to other sectors, cross-border understanding of fishing activities is weak and thus integrated advice cannot be currently provided to inform management decisions. VMS data provides the most cost efficient method to provide information on the spatial distribution of fishing activities.

The rationale for the joint call is that ICES and HELCOM share the mission of advising on the impacts of fishing and the use of space in the Baltic Sea. By creating a joint call, the need for the data is reconciled with a rational approach to the cost of extracting and submitting the data by the states.”

Table 94. Planned joint ICES/HELCOM data calls for VMS data (effort data) 2013. Source: Study survey

Name	Year / Month of launch	Year / Month of deadline	Type of data required	Legal basis	Frequency
Effort data call HELCOM/ICES in joint arrangement	(planned as of Sept 2013) to be announced for October 2013	??	Effort data: VMS data that record the position/speed etc. of the vessel	??	First one

Format and content

Following the official data call, it is planned that data should be sent by e-mail to HELCOM using the FishFrame⁷⁵ text format.

1.7.3.2. OSPAR

Procedures

OSPAR does not raise specific data calls in relation to DCF. For environmental data, the ICES data centre will receive monitoring data submitted by Contracting Parties under the CEMP in agreed formats⁷⁶. OSPAR may request advice or evaluation of specific environmental (including e.g. fish) topics from other institutions like e.g. ICES.

Formats and content

Not applicable for OSPAR since they do not host a DCF relevant.

1.7.3.3. Barcelona Convention

As explained above, this is not relevant to the Barcelona Convention

1.7.3.4. Bucharest Convention

As explained above, this is not relevant to the Bucharest Convention

⁷⁵

<http://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20%28CRR%29/crr296/CRR%20296.pdf#search=fishframe>

⁷⁶ ICES OSPAR MoU 2009

1.7.4. Quality Control

1.7.4.1. HELCOM

According to HELCOM's principles of Data and Information Strategy⁷⁷ relevant quality control and validation procedures should be implemented in the information-management system. "The HELCOM data will be handled by data centre(s), preferably thematic data centres, working in cooperation with national data providers and on contractual agreement with HELCOM." In addition "the data centres [will] be responsible for ensuring that a) adequate data exchange formats, data handling and access procedures are prepared and updated, as necessary, and b) relevant quality control and validation procedures are in place including quality flagging of data". Further steps are" c) adequate inventories and compilations prepared of the data sets, and d) HELCOM data product requirements are met."

No specific information about quality control mechanisms are provided for the separate environmental data databases.

Data validation

No specific information about data validation concerning DCF related data is provided.

Storage of quality indicators

Not applicable as no specific information concerning DCF related data is provided.

Evaluation and conclusions

The validation and quality checks to be performed are of the responsibility of the data centres (e.g. ICES) hosting the data under contractual agreement with HELCOM. The statutes provide for quality control.

1.7.4.2. OSPAR

Data validation

OSPAR relies contractually in terms of data quality issues to the data centres handling their external databases. ICES has several data quality control procedures for fish and fisheries related data established (See Chapter ICES in Interim Report). No specific additional data validation tools for environmental databases have been checked within this study, since this is outside of the scope of this study.

⁷⁷

<http://helcom.fi/Documents/Action%20areas/Monitoring%20and%20assessment/Monitoring%20and%20assessment%20strategy/Monitoring%20and%20assessment%20strategy%20Att2.pdf>

Storage of quality indicators

As far as fisheries related data storage at ICES is concerned the quality indicators of most of the domains covering the detailed data as well as the aggregated data of all three ICES databases (DATRAS, RDB-FishFrame, InterCatch) are stored in the ICES Quality Control (QC) data base. This data base is offline.

1.7.4.3. Barcelona Convention

As explained above, this is not relevant to the Barcelona Convention

1.7.4.4. Bucharest Convention

As explained above, this is not relevant to the Barcelona Convention

1.7.5. Dissemination

1.7.5.1. HELCOM

The principles of the HELCOM data and information activities facilitate access of the general public to environmental information. This is done e.g. by making spatial data and information available in the HELCOM Map and Data Service on the HELCOM web page.

“Therefore, reporting activities should be scheduled not to interfere or to duplicate with those of other international organizations such as ICES and data activities of the European Union. Agreed formats and up-to-date tools for data exchange should make data and information available using harmonized standards and practices, following the Aarhus Convention and recommendations and guidelines and standards reflected in the INSPIRE directive. Data and information shall be easy accessible to use for indicator reports”⁷⁸.

Confidentiality of data

The HELCOM Data and Information Strategy⁷⁹ state that monitoring data “should be openly accessible online via web services or downloading functionality using common standards and ensuring that relevant quality control and validation procedures are implemented.”

However, restricted access can be implemented to data contained in working documents presented to HELCOM or its subsidiary bodies. Apart from the aforementioned restricted data, all HELCOM published data is freely accessible to all users.

⁷⁸

<http://helcom.fi/Documents/Action%20areas/Monitoring%20and%20assessment/Monitoring%20and%20assessment%20strategy/Monitoring%20and%20assessment%20strategy%20Att2.pdf>

⁷⁹

<http://helcom.fi/Documents/Action%20areas/Monitoring%20and%20assessment/Monitoring%20and%20assessment%20strategy/Monitoring%20and%20assessment%20strategy%20Att2.pdf>



Restricted access (WGs + Internal staff), including confidentiality – Map and Data Service database

The main users of the database are HELCOM WGs and the general public which all have full access.

Public access – Map and Data Service database

The DB is accessible through the internet: <http://maps.helcom.fi/website/mapservice/index.html>.

The data is updated on an ad hoc basis when new data is available and the update is accessible for all three user groups (internal staff, HELCOM WG and the general public). For the general public HELCOM pursues an active dissemination policy in which recent updates are included.

Services to extract ad hoc data for certain categories of users exist for all user groups and the general public. Data can either be requested through the web services or by e-mail requests to the DB manager.

Technical functionalities

HELCOM uses a Microsoft SQL Server 2012 RDBMS to store the data and the ArcGIS Viewer for Flex working with an ArcGIS Server is used to easily and quickly create customized GIS-enabled Web mapping applications—without requiring programming.

It is accessible through the internet: <http://maps.helcom.fi/website/mapservice/index.html>.

This tool allows users to display a number of georeferenced datasets pertaining to the environment (physical and biological), protected areas, pollution, shipping, fisheries (catches by gears) etc. Technical details about the content of the Fisheries MapServer instance can be found at the website⁸⁰.

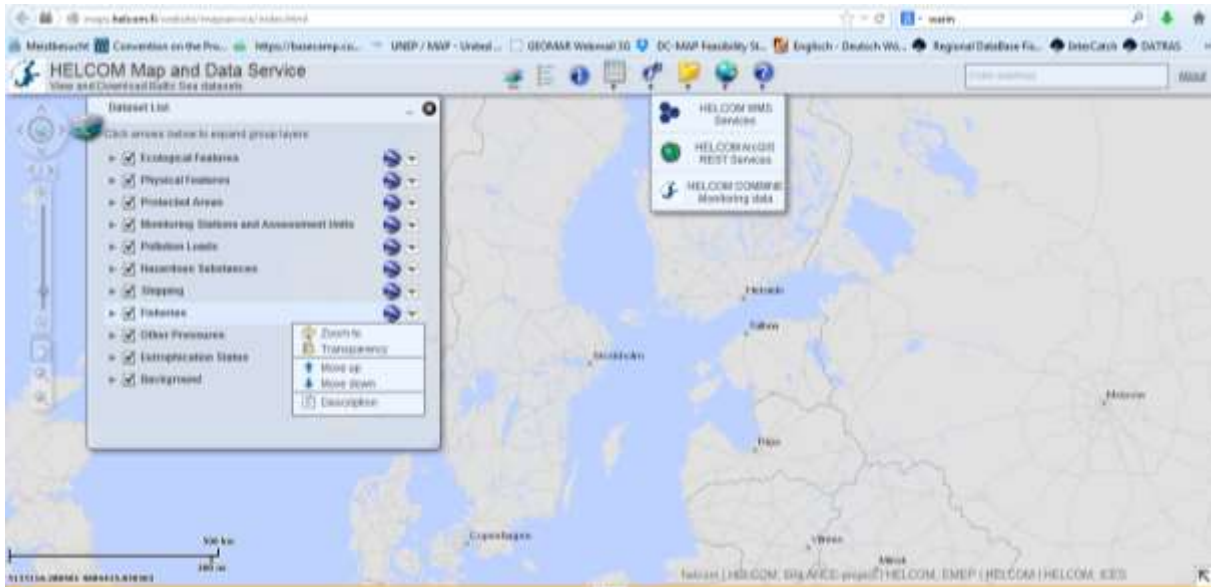
Layers can be displayed simultaneously to allow comparisons and users can do complex SQL queries to tailor the maps to their needs. Map layers can be downloaded as shape files, and datasets can be exported as CSV.

All layers and their data are documented by extensive metadata including data sources (with contacts for each country), units, aggregation levels, allowed usage etc.⁸¹

⁸⁰ <http://62.236.121.188/arcgis/rest/services/mapservice/Fisheries/MapServer>

⁸¹ http://helcom.fi/Documents/Baltic%20sea%20trends/Data%20and%20maps/MapAndDataService_UserManual.pdf

Figure 18. Screenshot of HELCOM Map and Data Service



Source: HELCOM website

1.7.5.2. OSPAR

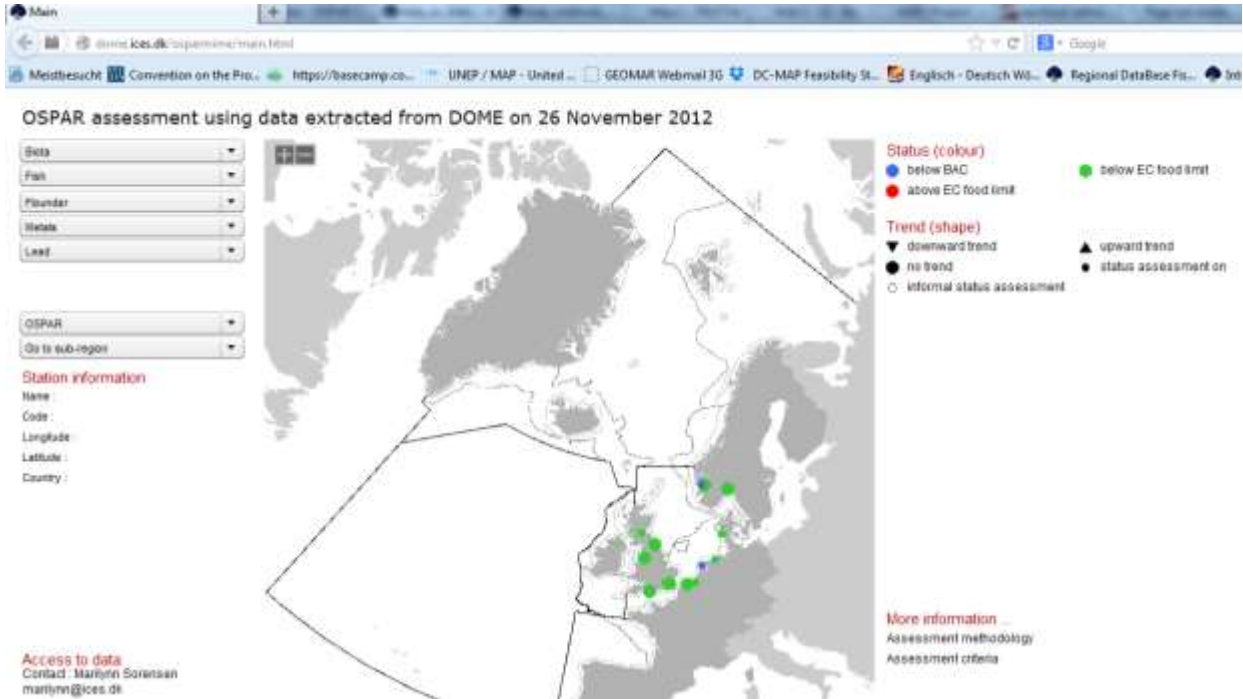
Since OSPAR does not host any DCF relevant database, no specific dissemination tools exist for these.

OSPAR is working to make relevant environmental data accessible for use by Contracting Parties. However, the ICES Secretariat serves as data centre for data collected under the Co-ordinated Environmental Monitoring Programme ("CEMP") under the OSPAR Joint Assessment and Monitoring Programme ("JAMP"). The database DOME is hosted at ICES⁸², and visualizes the monitoring data of the concentrations and effects of selected contaminants and nutrients in the marine environment in the OSPAR region (Figure 19). Data on fish bio-pollution can be found here for example. The download or use of data provided through the OSPAR webpage is coupled to the general user agreement on data from the OSPAR website.⁸³

⁸² <http://dome.ices.dk/osparmime/main.html>

⁸³ http://www.ospar.org/html_documents/ospar/html/ospar_data_conditions_of_use.pdf

Figure 19. Screenshot of DOME database – Selection steps to exemplify: 1)Biota 2)Fish 3)Flounder 4)Lead 5)OSPAR Region.



Source: ICES Webpage

The QSR Report and many datasets related to environmental and other databases, as presented in the Overview section-Table, are of free access and can be downloaded via the provided links on the OSPAR website⁸⁴.

Confidentiality of data

To guarantee data confidentiality the statutes of OSPAR would need to be updated accordingly and this would take more than a year.⁸⁵

Restricted access (WGs + Internal staff), including confidentiality

For OSPAR, not relevant since no DCF relevant data are stored and disseminated.

Public access

For OSPAR, not relevant since no DCF relevant data are stored and disseminated.

⁸⁴ http://www.ospar.org/content/content.asp?menu=01511400000000_000000_000000

⁸⁵ Study survey questionnaire Table 6.1

Technical functionalities

Technical functionalities of data dissemination of OSPAR are not relevant for this study, as OSPAR does not host DCF data.

1.7.5.3. Barcelona Convention

As explained above, this is not relevant to the Barcelona Convention

1.7.5.4. Bucharest Convention

As explained above, this is not relevant to the Bucharest Convention

1.7.6. Institutional Considerations

1.7.6.1. HELCOM

Legal

HELCOM (Baltic Marine Environment Protection Commission - Helsinki Commission) is the governing body of the Convention on the Protection of the Marine Environment of the Baltic Sea Area, known as the Helsinki Convention. The contracting parties are Denmark, Estonia, the European Union, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden.

The legal basis of HELCOM is the Helsinki Convention⁸⁶. HELCOM has a Memorandum of Understanding (MoU) with ICES⁸⁷. An example for the close collaboration is the DOME Data portal⁸⁸ (Marine Environment) hosted at ICES, which is used by OSPAR, HELCOM and AMAP (Arctic Monitoring and Assessment Programme) in the management of chemical and biological data for regional marine assessments. DOME contains data of contaminants in biota, sediment and water, biological effects, including fish disease or biological communities.

Important relations to the EU legislations exist. HELCOM is bound to the EU Data Collection Framework, Marine Strategy Framework Directive and the Integrated Maritime Policy legislations. HELCOM acts as intermediary and end-user of DCF related data.

Administrative

Confidentiality through the legal binding to the EU DCF is assured in the HELCOM Convention, which states: “the provisions of this Convention shall not affect the right or obligation of any

⁸⁶

http://helcom.fi/Documents/About%20us/Convention%20and%20commitments/Helsinki%20Convention/1992_Convention_1108.pdf

⁸⁷ <http://www.ices.dk/community/advisory-process/Documents/MoU%20ICES%20and%20HELCOM%201999.pdf>

⁸⁸ <http://www.ices.dk/marine-data/data-portals/Pages/DOME.aspx>

Contracting Party under its national law and applicable supra-national regulation to protect information related to intellectual property including industrial and commercial secrecy or national security and the confidentiality of personal data”⁸⁹. There are provisions in the HELCOM Data and Information strategy in relation to confidentiality of the data. Even though monitoring data “should be openly accessible online via web services or [...] downloadable [...]”, restricted access can be implemented. This was mentioned for data in working documents presented to HELCOM or its subsidiary bodies.

Financial

HELCOM is funded by Member States contributions.

HELCOM has its own staff for database development and maintenance but no dedicated budget for database development.

1.7.6.2. OSPAR

Legal and administrative

The legal basis of OSPAR is the Convention⁹⁰ (1992) for the protection of the marine environment of the North-East Atlantic.

“The OSPAR Convention has been signed and ratified by all of the Contracting Parties to the original Oslo or Paris Conventions (Belgium, Denmark, the European Community, Finland, France, Germany, Iceland, Ireland, the Netherlands, Norway, Portugal, Spain, Sweden and the United Kingdom of Great Britain and Northern Ireland) and by Luxembourg and Switzerland”

“The OSPAR Convention entered into force on 25 March 1998 and replaced the Oslo and Paris Conventions but Decisions, Recommendations and all other agreements adopted under those Conventions continue to be applicable, unaltered in their legal nature, unless they are terminated by new measures adopted under the 1992 OSPAR Convention.

“The first Ministerial Meeting of the OSPAR Commission at Sintra, Portugal in 1998 adopted Annex V (ON THE PROTECTION AND CONSERVATION OF THE ECOSYSTEMS AND BIOLOGICAL DIVERSITY OF THE MARITIME AREA) to the Convention, to extend the cooperation of the Contracting Parties to cover all human activities that might adversely affect the marine environment of the North-East Atlantic. Nevertheless, programmes and measures cannot be adopted under the Convention on **questions relating to fisheries management** and there is a preference for issues related to shipping to be dealt with by the International Maritime Organisation.”

⁸⁹

http://helcom.fi/Documents/About%20us/Convention%20and%20commitments/Helsinki%20Convention/1992_Convention_110_8.pdf

⁹⁰ http://www.ospar.org/html_documents/ospar/html/ospar_convention_e_updated_text_2007.pdf

Annex V 4(1) of the OSPAR convention⁹¹ states explicitly that “no programme or measure concerning a question relating to the management of fisheries shall be adopted. However where the OSPAR Commission considers that action is desirable in relation to such a question, it shall draw that question to the attention of the authority or international body competent for that question. Where action within the competence of the OSPAR Commission is desirable to complement or support action by those authorities or bodies, the OSPAR Commission shall endeavour to cooperate with them.”

OSPAR and ICES share a MoU (2007), in which they agree that the ICES Secretariat will serve as data centre for data collected under the Co-ordinated Environmental Monitoring Programme ("CEMP") under the OSPAR Joint Assessment and Monitoring Programme ("JAMP"),

- a. on data on contaminants observed in the compartments waters, sediment and biota of the marine environment;
- b. data resulting from biological monitoring (including biological effects monitoring);
- c. data on nutrients and eutrophication effects resulting from the Eutrophication Monitoring Programme as part of the CEMP

OSPAR is related to the EU legislation of the Marine Strategy Framework Directive (MSFD)⁹².

OSPAR is working to make relevant data accessible for use by Contracting Parties. Potential constraints are foreseen by OSPAR in relation to the MSFD in terms of access (upload), transmission, storage and dissemination of data if no adherence to agreed data and metadata standards being implemented within the MSFD are ensured⁹³.

Financial

OSPAR is funded by Contracting Parties contributions. No approximate annual budget was mentioned by OSPAR.

OSPAR has one staff for database development and also relies on (unspecified) external support. As of 2013 a dedicated budget for database development exists in OSPAR. The total average annual budget over the last three years for all data needs is 15,000€. The OSPAR budget⁹⁴ in 2012 separates into hosting infrastructure (5,857€), software license fees (2,341€), IT maintenance (8,199€) and staff training (579€).

⁹¹ http://www.ospar.org/html_documents/ospar/html/ospar_convention_e_updated_text_2007.pdf; page 28

⁹² Study survey questionnaire, Table 6.1

⁹³ Study survey questionnaire, Table 6.1

⁹⁴ Recalculation from UK £

1.7.6.3. Barcelona Convention

As explained above, the Barcelona Convention is not relevant for the DC-MAP project, as it does not collect any fisheries data.

1.7.6.4. Bucharest Convention

As explained above, the Bucharest Convention is not relevant for the DC-MAP project, as it does not collect any fisheries data.

1.8. Eurostat

1.8.1. Summary

- Eurostat has a strong legal background for statistical production and dissemination, including the possibility of collecting confidential data and the role of coordinating the European Statistical System through different governance arrangements (European Statistical Programme, European Statistical System Committee, MoU with other DGs of the Commission).
- Fish processing industry data are regulated by the SBS data collection.
- Eurostat is using the eDAMIS tool, operational since several years as a transmission channel for most of the statistical data collection. eDAMIS integrates automated secured procedures for transmission. The SDMX-ML format which includes metadata information is currently used to collect Fisheries statistics. As such, it is more complex compared to the new/on test FLUX developed by DG MARE (which uses the same kind of transmission layer and principle than eDAMIS but a simpler format base on XML only).
- The general policy applied at the European Commission is to try to reuse existing tools in the institutions and harmonise the standards as far as possible. In that spirit, the tools currently used for fish production and fish processing data are common tools (called respectively MDT and EBB) used to process different domains of statistics in Eurostat. Eurobase is also the dissemination tool for almost all statistical domain managed at Eurostat. Nevertheless it has to be noted that the metadata for fisheries are not always up to date in Eurobase⁹⁵.
- Eurostat is involved in international coordination activities aiming at reducing response burden: FAO uses the questionnaire of Eurostat on catches and landings; Eurostat collects data for NAFO.
- There is an overlap between collection of aquaculture data by Eurostat and JRC. More detailed economic variables are required by DCF (via JRC). But Eurostat collects more exhaustive data on the sector as it collects detailed information about all enterprises not

⁹⁵ Except the Total Fisheries Production ESM files, which has been updated the 4th March 2013.

only those where aquaculture is the main activity as JRC do. The detail by species and method of production required by Eurostat is more detailed than DCF requirements for species and is subject to more quality control than in JRC.

- Eurostat applies strict confidentiality rules on aquaculture consisting in not building aggregated data for dissemination if one of the records in the aggregate is confidential. This approach limits the dissemination of many aggregates. In particular EU aggregates.
- There is an overlap between data on fish processing industry collected by JRC and Eurostat. More economic variables are required by Eurostat under SBS than JRC under DCF. Coverage of Eurostat data refers to enterprises with fish processing as main activity, while JRC collects also for those with fish processing as secondary activity.
- Eurostat registers landings in the MS, incl. foreign vessels (MS and EFTA vessel mandatorily and third country vessel optionally) in product weight (weight recorded is the weight of the product as landed). On the contrary, DCF register landings of the MS fleets, incl. landings in foreign ports, in live weight. Consequently, there are differences in landings data between Eurostat on hand and DCF data on the other hand. Value and product weight of landings are available by MS, presentation form (fresh, frozen, etc.) and destination (human consumption, industrial use, etc.).
- Catches data are collected for MS and EFTA countries and includes recreational fisheries are expressed in the live weight equivalent of the landings. Eurostat gives information on annual catches in live weight by FAO main fishing areas even if data call also collects gear and vessel size information.

1.8.2. Data Storage and Access

Overview

Eurostat collects and disseminates information on:

- Aquaculture (Unit E1 - Agriculture and Fisheries Statistics Fishery statistics' section).
- Catches and landing (Unit E1 - Agriculture and Fisheries Statistics Fishery statistics' section).
- Fish processing industry, under the SBS data collection (Unit G2).
- Fleet data disseminated by Eurostat are not collected from MS but extracted from **the DG MARE's Community Fishing Fleet Register** and disseminated at aggregated level (Unit E1 - Agriculture and Fisheries Statistics Fishery statistics' section).

There is one economical production database for catches, landing and aquaculture data. The fish processing industry data are compiled like other data responding to the SBS Regulation requirements (i.e. any other activity sectors). All data to be published are stored in the common dissemination database called Eurobase.

Table 95. Databases – names and domains

Name of the database	Domain covered by the database	Production / dissemination DB
MDT (multi dimensional tables)	Catches, landing, aquaculture Fleet (under implementation – almost finished)	Production
EBB/ Eurocube	Fish Processing	Production
Eurobase	Catches, landing, aquaculture, fleet, fish processing	Dissemination

Note: Eurostat proposes in addition total fishery statistics being the sum of fisheries and aquaculture.

The server infrastructure is hosted by DIGIT but the databases are managed by IT administrators in Eurostat.

For unit E1, MDT is supported and its maintenance/evolution is outsourced to an external contractor working in house (1 dedicated staff).

For unit G2, the *Eurocube*/EBB applications are managed by contractors to directorate ESTAT/B and further development/ update of scripts is often dependent on external contractors.

The production and dissemination databases are not directly connected but specific functions allow exporting reference data from the production database to Eurobase.

As regard the documentation, there is a user guide for the MDT tool but no administration guide and no technical documentation on the IT implementation of the processing of fisheries data in MDT. The MDT support has been asked to provide the validation rules implemented into MDT (mostly copied from FAME). This work is ongoing. There are technical guides for using EBB.

Fisheries data collected by Eurostat are shared with other institutions:

- DG MARE:
 - There is an on-going study on the possibility to use directly the catch data collected by DGMARE. The comparison of data for 2012 is under way.
 - Fleet register information from DGMARE was uploaded in Eurobase until 2010 (stopped since the introduction of MDT).
- NAFO:
 - Eurostat collects the data on behalf of NAFO (21B questionnaire on catches).
- FAO:
 - All electronic questionnaires collected for catches are automatically forwarded to FAO.
 - FAO catches questionnaire are transmitted to Eurostat but are not used as such.

- In the past, Eurostat completed also its database with FAO data for areas not covered by the regulation (inland water not covered by regulation then incomplete as provided on a good will basis, area out of Europe...). Nevertheless, since 2011, these data are not included anymore in the Eurostat. Eurostat is not involved in the quality assessment.
- Eurostat and FAO are working together in CWP to standardise the statistics on fisheries (CWP handbook on fisheries statistics standard on FAO web site <http://www.fao.org/fishery/cwp/search/en>).
- ICES:
 - Consolidated data for catches in area 27 are shared with ICES under a partnership agreement.
- For aquaculture and fish processing, no direct exchange of information exists (any user can extract data from Eurobase) Unit G2 was never in contact with JRC for fish processing data.

3.8.2.a - The MDT database of Eurostat (catches, landing, aquaculture)

The MDT software manages Eurostat statistical data in a variety of domains, and as such it is not specific for fishery statistics but it was customised to cover the needs of fisheries sector.

Connection

The MDT software developed in Java is connecting an Oracle database accessible through the Eurostat intranet. Only users from the unit can connect to the MDT and access the data.

Database structure

The Agriculture and Fisheries Unit started implementing a three year re-engineering plan (from the end of 2011 to mid-2014) aiming at migrating all the domains still working with different tools into a corporate system. The MDT tool (multidimensional tables) is a generic application to process time series oriented data. MDT provides a common conceptual and technical framework (defining a standard workflow shared by all the domains, having a common set of dictionaries, dimensions and functions and sharing the same database).

The structure of the database source files are almost the same as the structure of the Excel file imported (see chapter on format and content), only field common for the all dataset like frequency are not updated.

A client application written in Java allows accessing the MDT Oracle database.

Table 96. MDT technical and functional issues analysis

Technical requirements	
Technical trends	Oracle, Java
Connection	Intranet
Cost : software purchase/ maintenance fees	Use of proprietary solution Oracle version for the database The application is developed and maintained by external contractors
Interoperability with other system and web services	From the MDT, reference data can be exported into the Eurobase format and the data can then be imported into Eurobase. This is a semi manual process as the files prepared in MDT placed in a specific drive dedicated to Eurobase, will be automatically loaded in the Eurobase.
Conformity to standards	The concepts, definitions and classifications used in this database are those developed by the Coordinating Working Party on Fishery Statistics (CWP) and published in the "Handbook of Fishery Statistical Standards".
Referential	The coding in Eurobase and MDT are different, meaning the data are mapped from MDT to Eurobase, which makes the process more complicated and more complex.
Reusability	The MDT software manages Eurostat statistical data in a variety of domains, and as such it is not specific for fishery statistics
Updatability/genericity: customisation of the tests	The system is generic and can be configured for managing different types of domains. New tests can be defined by advanced users without needing the recompilation of the application. The tests will be combined to constitute the validation algorithm. New tests can be added to the algorithm to complete it.
Data security and Access level	Security: the database is installed on a server hosted at the DIGIT, which is the IT general directorate of the commission managing the server and ensuring all security and infrastructure maintenance tasks Access: Logging to the intranet and the MDT All users in fisheries units have the same rights.
Follow up of user requests	No specific system in place
Functional requirements	
Metadata management	The data transmission is monitored via the eDAMIS. The metadata: Euro Process Meta Data structure (EPMS) describing the processing of the data for each sector exists but needs to be revised. The EPMS is more detailed and up to date than the ESMS (euro SDMX metadata structure) metadata available in Eurobase but is an internal document. Notes can be integrated at the file level in MDT but not at the record level. Flags and other notes are indicated by the MS.
Upload facilities	This is a semi manual process as the files received from MS must be placed in a specific drive dedicated to the input of fisheries data for MDT, will be automatically loaded in the MDT.
Automated validation	Made in MDT. The rules applied can be reused in different datasets or domains..
User-friendliness and easiness to use	The interface of MDT is easy to use. DB manager is only able to use the MDT too but needs assistance to prepare the Excel template used for the data transmission which includes the DSD for converting Excel to SDMX format and embedded coding checks in the system and finally can hardly implement new rules or know exactly what is checked in the system;
Availability of technical documentation	There is a MDT User guide but no technical documentation available (foreseen but not yet available);
User support	Available, external contractor but IT support for MDT is dependent from a contract renewed every year
Resource needed for the maintenance	External resources

Source: Feasibility study

Aggregation level (variables and dimensions)

Data are disseminated in Eurobase at the same level of detail than the data collected in MDT except for catches where the main fishing gear operation and vessel size details are not provided.

In addition, sum at higher level will be made for being stored in Eurobase with the detailed aggregates. This includes: yearly aggregates, species groups (mollusc, fresh water...) aggregates, FAO higher level aggregates, EU aggregates.

Data processing and estimations

The processing, analysis and dissemination stages can be described as follows⁹⁶:

Figure 20. GSBPM stages corresponding to the MDT harmonisation procedure

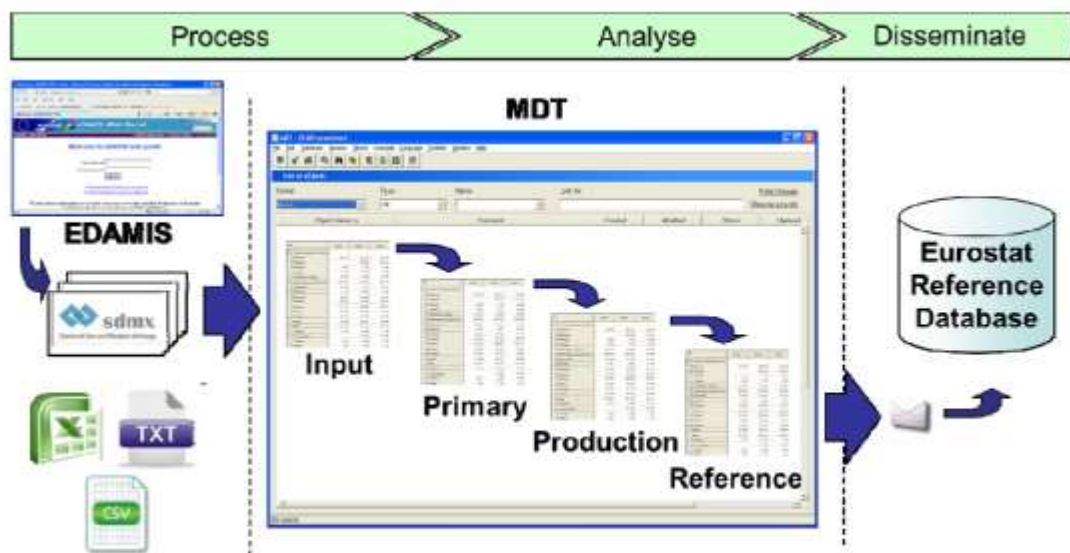


Figure 1: GSBPM stages corresponding to the MDT harmonisation procedure

Source: Eurostat

It is assumed that the collection stage is finished in the EU Member States and that the data files submitted via Eurostat’s Single Entry Point, eDAMIS, are available.

⁹⁶ http://www.unece.org/fileadmin/DAM/stats/documents/ece/ces/ge.50/2013/Topic_2_Eurostat.pdf

Process stage

The DB manager copies the SDMX-ML files received from eDAMIS to a specific network drive. An automatic loading component validates the SDMX-ML files submitted and uploads them into input tables in MDT, verifying the data numeric fields and code lists.

As the diagram above illustrates, some ad hoc file formats are still supported (but only for historical data).

There is no predefined deadline for the compilation time at Eurostat.

Analysis stage

Primary data: When the data is available in the input tables (one table per data file, the domain manager can start an automated process that will first validate the data according to the specified validation rules, detecting outliers and suspicious values. If the results of the tests are acceptable, the DB manager will accept the file which will be migrated in a primary table.

Production data : The aggregates are calculated (aggregates based on integrity rules, yearly aggregates, species groups (mollusc, fresh water...) aggregates, FAO higher level aggregates, EU aggregates), their flags⁹⁷ are computed and data are copied to production. If needed (aquaculture and landings data) currency can be converted using an official fixed currency converter Confidentiality flag will be settled appropriately when aggregating the data.

Reference data: The last step consists of copying the non-confidential data to reference tables.

Disseminate stage

A function in MDT allows exporting data from the reference dataset in a format suitable for Eurobase. The data files are then stored manually on a specific drive to be automatically uploaded in Eurobase and made accessible on Eurostat's website.

3.8.2.b - The SBS database of Eurostat

Data on the fish processing industry are stored and processed by Eurostat in the same way as those for other sectors covered by the Structural Business Regulation (SBS). They are validated via the EBB tool and stored in an Oracle OLAP database.

Connection

The EBB is installed on the Intranet and requires the user to be connected in the intranet and also to log in EBB.

⁹⁷ "Flags" is the standard name used in Eurostat for symbols indicating metadata necessary for understanding the disseminated data. .



Database structure

Data validation is performed with a generic standard tool in force at Eurostat called Editing Building Block (EBB). The EBB system should ensure the validation of the data transmitted based on the application of a series of validation rules. In order to improve the quality at the MS level and to avoid forth and comes, Eurostat has developed a standalone application of EBB working in a similar way as the Eurostat EBB system. The EBB standalone would be configured with the same script of validation rules, so that it can be used in the MS to check the data files prior to send them to Eurostat. The clean file should then pass the EBB testing script at Eurostat.

After the validation stage, the data are compiled in an Oracle OLAP database and accessed using the *Eurocube* data system for internal use and preparation of tables to be imported for dissemination in the general Eurostat dissemination database *Eurobase*.

Table 97. EBB/ Eurocube⁹⁸ technical and functional issues analysis

Technical requirements	
Technical trends	Oracle Eurocube technology not known
Connection	Intranet for all
Cost : software purchase/ maintenance fees	EBB: Use of proprietary solution Oracle version for the database The application is developed and maintained by external contractors
Interoperability with other system and web services	Connection between EBB – Eurocube : no connection is made as the same files are processed in EBB and Eurocube systems: the EBB being only a validation system run in a separated tool. Connection between Eurocube and Eurobase: a semi automated process is made. Files are exported from Eurocube into Eurobase format and send via email to Eurobase.
Conformity to standard	SBS standard as defined by the regulation
Referential	Unknown
Reusability	The EBB is used for validating the data from different statistical sectors
Updatability/genericity: customisation of the tests	The EBB system is generic: it is based on a meta language for the definition of rules that is more understandable (and customisable) for non-programmers
Data security and Access level	Security: the databases are installed on a server hosted at the DIGIT, which is the IT general directorate of the commission managing the server and ensuring all security and infrastructure maintenance tasks Access level from the intranet only
Follow up of user requests	Not known
Functional requirements	
Meta data management	None in EBB
Upload facilities	EBB: This is a manual process. Input files have to be entered manually by the operator as well as parameters for launching the job aiming at checking the file
Automated validation	In EBB, validation script can be constructed and automatically run leading to error reports. Eurocube: unknown
User-friendliness and easiness to use	Production software. Training is needed for EBB and Eurocube. These production softwares are very powerful but also sophisticated.
Availability of technical documentation	Meta language guide and user training presentations are available for EBB No technical documentation was provided for Eurocube
User support	EBB: external intra-muros support Eurocube: Unknown
Resource needed for the maintenance	EBB software is developed and maintained by an external company under the supervision of unit B4. Eurocube: Unknown

Source: Feasibility study

⁹⁸ The Contractor could not develop in detail the technical and functional issues analysis for the Eurocube system due to the lack of information

Aggregation level (variables and dimensions)

The data requirements are defined in Regulation No 251/2009⁹⁹, while the technical format is defined in Regulation No 250/2009¹⁰⁰.

Data processing and estimations

The fish processing industry data are compiled like other data responding to the SBS Regulation requirements (i.e. any other activity sectors).

Since 2012, The EBB system standalone package is proposed for installation at the MS to check the data before they are sent to Eurostat and therefore to achieve better quality of data as tests will be performed directly at the source level.

Eurostat continue to perform the test in the Eurostat EBB server system applying the same tests as EBB standalone for testing the data received.

The data are then uploaded from files sent by the MS on *Eurocube* system for further processing, aggregation and confidentialisation of the data.

The data extracted from *Eurocube* for Eurobase are sent by e-mail to be uploaded in Eurobase.

3.8.2.c - The Eurobase dissemination database

Connection

The Eurobase database is accessible to the public (no logging access) and it contains the latest validated/revised data which are automatically uploaded when provided by production units.

The Eurobase database provides public access to all statistical domains (except external trade which has a huge separated database due to the volume of data processed). Fisheries statistics data can be found at <http://epp.eurostat.ec.europa.eu/portal/page/portal/fisheries/introduction>.

The web site has been operational for years.

Database structure

Only a web browser is needed to access the Eurobase

Eurobase is based on a generic IT application for browsing multidimensional tables including code lists, flags and foot notes.

The Eurobase is an Oracle database.

⁹⁹<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:086:0170:0228:EN:PDF>

¹⁰⁰<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:086:0001:0169:EN:PDF>

Table 98. Eurobase technical and functional issues analysis¹⁰¹

Technical requirements	
Technical trends	Oracle
Connection	Internet
Cost : software purchase/ maintenance fees	Use of proprietary solution Oracle version for the database
Interoperability with other system and web services	The productions systems at Eurostat have export functions in Eurobase format.
conformity to standard	Is unknown whether operation/process in place to harmonise the nomenclatures between domains exists.
Referential	The coding in Eurobase and the production systems are sometimes different, meaning the data are mapped from MDT to Eurobase, which makes the process more complex.
Reusability	Eurobase is used to disseminate data from all statistical domains
Updatability/genericity: customisation of the tests	The system is not generic and new tables/views need to be hardcoded in Eurobase before being accessible for upload and online.
Data security and Access level	Security: the database is installed on a server hosted at the DIGIT, which is the IT general directorate of the commission managing the server and ensuring all security and infrastructure maintenance tasks Access level is public
Follow up of user requests	No specific system in place
Functional requirements	
Meta data management	Formats for metadata and flags are standardized in all Eurostat domains Meta data describing the domain are sometimes not up to date.
Upload facilities	This is a semi manual process as the files received from production units must be placed in a specific drive dedicated to be automatically loaded in the Eurobase.
Automated validation	Validation is focused on the format of uploaded files
User-friendliness and easiness to use	The interface of Eurobase is easy to use.
Availability of technical documentation	No technical documentation was provided.
User support	Unknown
Resource needed for the maintenance	Unknown

Source: Feasibility study

Aggregation level

No aggregation performed in the system, aggregates are already pre calculated by the production units.

Data processing and estimations

Data provided by production units are automatically uploaded in the system.

¹⁰¹ The Contractor did not receive documentation on Eurobase

1.8.3. Data Upload

The production databases are separated from the dissemination databases, thus ensuring confidentiality. In this chapter, it will be described how:

- Fleet, catches, landing and aquaculture data are uploaded in the production database MDT;
- Fish processing industry is uploaded in the production database EBB/Eurocube;
- All fisheries data are uploaded in the dissemination database Eurobase.

3.8.3.a – The MDT database

Upload of fleet data in MDT

Eurostat uses the DGMARE fleet register at the individual data level to prepare the data disseminated on the web site.

Previously, the FAME system was used to aggregate the fleet register data. Currently, the fleet register is not disseminated as Eurostat is updating the MDT system to handle the fleet data and preparing new aggregates.

Upload of catches, landings, effort and aquaculture data in MDT

Procedures

The data transmission from providers (MS) to Eurostat is done via the eDAMIS (electronic Data files Administration and Management Information System). **eDAMIS** offers standard solutions for collecting data files in the European Statistical System. **eDAMIS** implements the concept of the Single Entry Point (SEP), facilitates fully automated data transmissions, guarantees secure transmissions, Offers value added services such as: traffic monitoring tables allowing Eurostat to follow up the data transmission, acknowledgements allowing the providers to be automatically informed when the files are delivered at Eurostat, reminders to remind a close deadline.

Secured data transmission: eDAMIS always provides a secure (encrypted) data transmission channel on Internet. For confidential data, eDAMIS uses a public key for providing a second level of encryption which guarantees that data is delivered encrypted in the Eurostat secure environment (and decrypted there with a private key)

The Catches data calls are regular data call launched every year one month before their deadline.

Catch data are collected for MS and EFTA countries (including recreational fisheries) and are expressed in the live weight equivalent of the landings.

Table 99. List of data calls and their timing in 2011-2013

Data call on catches	Legal basis	Deadline	Type of data required
Catches in Area 21 (NW Atlantic) FISH_C21A_A.xls	217/2009	31/05	Yearly catches (total live weight) in Area 21 (north west Atlantic)
Catches in Area 27 (NE Atlantic) FISH_C27_A.xls	218/2009	30/06	Yearly Catches (total live weight) in Area 27 (north east Atlantic)
Catches in Area (other than those of north Atlantic, i.e. areas 34, 37, 41, 47, 51) FISH_34_To_51.xls	216/2009-	30/06	Yearly Catches in Area 21 -27 ((other) -
Fishing catches and effort in the area 21b – monthly data- FISH_C21B_A.xls	217/2009	31/08	Monthly Catches /effort in Area 21 (north-west Atlantic)

Source: Feasibility study

The landing data call, based on regulation 1921/2006, is composed of one template called LANDG_A.xls. It is a regular data call launched every year one month before the deadline which is the 30/06.

Eurostat registers landings in the MS, incl. foreign vessels (MS and EFTA vessel mandatorily and third country vessel optionally) in product weight¹⁰² (weight recorded is the weight of the product as landed). Value and product weight of landings are available by MS, presentation form (fresh, frozen, etc.) and destination (human consumption, industrial use, etc.).

The aquaculture data call, based on regulation 762/2008, is composed of six templates. It is a regular data call launched every year two months before the deadline which is the 31/12.

- FISH_AQ2A_A.xls: production from aquaculture excluding nurseries and hatcheries.
- FISH_AQ2B_A.xls: production of eggs for human consumption.
- FISH_AQ3.xls: statistical data on input to capture-based aquaculture.
- FISH_AQ4.xls: statistical data on production of nurseries and hatcheries.
- FISH_AQ5.xls: structure of the aquaculture sector: it is only collected once every three years.
- FISH_AQ6.xls: annual methodological report of the national systems for aquaculture statistics: organisation of the national system for aquaculture statistics (authorities responsible for the collection of aquaculture data, national legislation, etc.); method of

¹⁰² Statistical population for landing as described in Eurostat meta data : Under the terms of Council Regulation no 2104/93, the reporting country is required to include data for all products landed by Community and EFTA fishing vessels in ports of that country. Under the provisions of the Regulation the reporting country is not required to report landings by its vessels in ports other than the national ports.

The data are required to include products discharged within the territory of the reporting country and covered by document T2M referred to in Council Regulation (EEC) no 137/79. Also included are products transhipped to vessels of third countries from Community and EFTA fishing vessels and other components of the Community and EFTA fishing fleet which are discharged within the territory of that Member State.

collecting, processing and compiling the aquaculture data; and quality aspects in line with the ‘Code of Practice for the European Statistical System’.

Revisions are also received without predefined schedule and are processed on the fly. Usually revisions are sent at the same time as a new data calls.

Formats and content

For the data calls, Eurostat provided up to date Excel templates where the first worksheet is a “readme” file giving explanations. Nomenclatures are given in the file as separate worksheets (and are used to check the validity of the code entered by MS in the data entry sheet), files can be converted to SDMX- XML for being send in the format expected by eDAMIS.

The format changed in 2010 (for 2011 data) when the new MDT system was implemented. It did not change since then but the Excel files needs to be updated to reflect the updates in nomenclature (nomenclatures work sheets updated to allow automated checks as well as embedded SDMX checks).

Problems in the data upload have been faced by providers /recipients:

- Providers were supposed to provide data directly in SDMX format. Providers have difficulties to generate the SDMX files, therefore Eurostat decided to prepare an Excel file and the possibility to export the data entered in SDMX.
- Eurostat encounters problem if MS used the former template, as code may not be valid anymore.
- Providers were trained on the new format.

Content of the FISH data calls on catches and effort and comparison with DCF

Note: the distinction between catches and landings appears to be quite irrelevant considering that statistics are always about landings. However, distinct data calls are made by Eurostat. Discards are accounted for only by ICES.

Table 100. Content of the FISH data calls on catches and effort

Description of the variables and dimensions	FISH_C21A_A (North West Atlantic) FISH C27 (North East Atlantic) FISH 34 to 51 (Other areas than North Atlantic)	FISH_C21B_A catches (North West Atlantic)	FISH_C21B_A effort (North West Atlantic)
Frequency of report	Annual		
Reference period	Usually year. For catches 21B, timing at monthly level was done for a NAFO specific questionnaire.		
Declaring country	ISO Alpha-3 country codes are used.		
Geographic stratification	<ul style="list-style-type: none"> Level 1: FAO Major Fishing Areas Level 2: Fishing Sub-areas Level 3: Fishing divisions Level 4: Fishing subdivisions Level 5: Rectangles <p>Eurostat requires data on catches at level 4 (e.g. Atlantic, North West - 27.8.e.1), while DCF regulation requires data on catches at level 5 (e.g. rectangle 30' x 1°).</p> <p>DCF requires more geographically precise data than Eurostat.</p>		
Related FAO Major Fishing Area	21, 27 34 to 51	21	21
Species	<p>FAO ASFIS list of species is used:</p> <ul style="list-style-type: none"> 12421 species items selected according to their interest or relation to fisheries and aquaculture Three types of codes (ISSCAAP, taxonomic and 3-alpha) are assigned to each species item <p>The 3-alpha is a unique code widely used for the exchange of data with national correspondents and among fishery agencies. Both, Eurostat and DCF use the 3-alpha code for species identification.</p> <p>Specific aggregates of species groups have been developed within the Eurostat database.</p>		
Fishing gear category	Eurostat do not use a métier-based approach, data on gear is collected only in order to establish the main fishing gear. ISSCFG codes for fishing gear are defined in Regulation 1799/2006.		

Description of the variables and dimensions	FISH_C21A_A (North West Atlantic) FISH C27 (North East Atlantic) FISH 34 to 51 (Other areas than North Atlantic)	FISH_C21B_A catches (North West Atlantic)	FISH_C21B_A effort (North West Atlantic)
Vessel size class <ul style="list-style-type: none"> • < 6 m • 6-12 m • 12-18 m • 18-24 m • 24-30 m • 30-36 m (30 < 33 m) • 36-42 m (33 < 42 m) • > 42 	<p>ISSCFV codes of fishing vessels tonnage.</p> <p>For the Atlantic area, additional length classes are proposed: [0-9 m] and [9-12 meters] by Eurostat, [0-10 m] and [10-12 m] under DCF.</p> <p>Classes used by Eurostat are slightly different than the DCF ones. Eurostat length classes [24-30 m], [30-36 m], [30-33 m], [33-42 m], [36-42 m], [>42] are grouped into length classes [24 < 40 m] and [> 40] under DCF.</p>		
Fishing effort categories <ul style="list-style-type: none"> • Number of sets/hours fished/effort units/Thousands of hooks/Line days • Number of days fished • Number of days on ground 	-	-	✓
Observation value	Tonnes live weight	Metric tonnes	Effort unit
Unit (Tonnes live weight)	Optional as only tones live weight is expected	-	-
Average gross tonnage (in GT)	-	Optional	Optional
Average engine power (in KW)	-	Optional	Optional
Percentage effort estimated	-	Optional	Optional

Source: Feasibility study

Table 101. Content of LANDING data calls

Description of the variables and dimensions	FISH_LANDG_A
Frequency of report	Annual
Reference year	Year
Declaring country	ISO Alpha-3 country codes
Vessel nationality	Nationality classification based on ISO Alpha-3 codes specially built for this template (CL_REPORTING_AREA list)
Species code	FAO ASFIS Alpha-3
Presentation <ul style="list-style-type: none"> • Fresh (several) • Frozen (several) • Salted (several) • Smoked • Cooked (several) • Dried (several) • Whole • Claws • Eggs • Presentation unknown 	Breakdown variables listed and defined under Regulation 1921/2006
Destination <ul style="list-style-type: none"> • Human consumption • Industrial use • Withdrawn from market • Bait • Animal feed • Waste • Intend use unknown 	Breakdown variables listed and defined under Regulation 1921/2006
Unit (volume)	Tonnes live weights
Unit (value)	National Currency/Tonne

Source: Feasibility study

Table 102. Content of AQUACULTURE data call

Description of the variables and dimensions	FISH_AQ2A_A (Aquaculture excluding nurseries and hatcheries) FISH_AQ2B-A (Aquaculture eggs for human consumption)	FISH_AQ3 (Capture-based aquaculture)	FISH_AQ4 (Statistical data on production of nurseries and hatcheries)	FISH_AQ5 (Structure of the aquaculture sector)
Frequency of report	Annual		Tri-Annual	
Reference period	Year			
Declaring country	ISO Alpha-3 country codes are used.			
Related FAO MFA	1,4,5, 27, 34,37			
Aquatic environment <ul style="list-style-type: none"> • Brackish water • Fresh water • Sea water • Sea & Brackish water 	✓	-	-	✓
	Codes are listed and defined under the Regulation 762/2008.			
Production method <ul style="list-style-type: none"> • Ponds • Tanks and raceways • Enclosures and pens • Cages • Recirculation systems • Other methods • On bottom • Off bottom 	✓	-	-	✓
	Codes are listed and defined under the Regulation 762/2008.			
	The production method definition used by Eurostat differs from the DCF one. Under DCF, aquaculture sector is segmented as follows:			
	<u>Fish farming techniques</u>			
	<i>Land base farms</i>			
	<ul style="list-style-type: none"> • Hatcheries and nurseries (specific database in Eurostat) • On growing • Combined 			
	<i>Cages</i>			
	<ul style="list-style-type: none"> • Cages 			
	<u>Shellfish farming techniques</u>			
	<ul style="list-style-type: none"> • Rafts • Long line • Bottom • Other 			
Species	FAO ASFIS Alpha-3			<u>Related group</u> Finfish crustacean mollusc, aquatic plants

Unit (volume)	Tonnes live weight (TLW)		Millions	Thousands of M3, Hectares or Meter (according to the method)
Unit (value)	National currency/Tonne	National currency / Tonne	-	-
Confidentiality flag	Optional	Optional	Optional	-
Conversion factor	-	Optional	-	-
Multiplier of unit	-	-	Eggs/juvenile	Optional
Stage in the life cycle	-	-	Eggs/juvenile	-
Released to the wild (in millions)	-	-	Number (Optional)	-
Transferred to a controlled environment (in millions)	-	-	Number (Optional)	-

Source: Feasibility Study

Data uploaded on aquaculture to comply with Eurostat data calls is not the same as that requested by the DCF, as it can be seen in table 103 below.

Table 103. Comparison of aquaculture variables requested by Eurostat and the DCF (JRC).

Eurostat	DCF
Annual production of aquaculture- volume	Turnover
Annual production of aquaculture- unit value	Subsidies
Annual input to capture-based aquaculture- volume	Other Income
Annual input to capture-based aquaculture – unit value	Wages and salaries
Annual production of hatcheries and nurseries	Imputed value of unpaid labour
Structure of aquaculture sector (Ha)	Energy costs
Structure if aquaculture sector (m3)	Livestock costs
	Feed costs
	Repair and maintenance
	Other operational costs
	Depreciation of capital
	Financial costs, net
	Extraordinary costs, net
	Total value of assets
	Net investments
	Debt
	Livestock
	Fish feed
	Volume of sales
	Number of persons employed
	FTE National
	Number of enterprises

3.8.3.b – EBB/Eurocube

Upload of fish processing data in EBB/Eurocube

Procedures

The transmission of all data (and metadata) covered by SBS (thus including those on fish processing) is given with great detail in the technical annexes to Commission Regulation (EC) No 250/2009 of 11 March 2009. It is not governed by a specific call by Eurostat, but MS transmit data in a specified format (which is automated in MS).

MS send data and a number of metadata. In addition, they are required to submit quality reports.

Metadata to be included together with data comprise: quality flag (on revisions, provisional data, etc.), confidentiality flag and other values necessary for checking the confidentiality (based on the “dominance rule”) and measuring units.

The logo for cofad, consisting of the word "cofad" in a bold, blue, sans-serif font.The logo for devstat, featuring a stylized red 'd' with two black dots above it, and the word "devstat" in a red, lowercase, sans-serif font below.The logo for FRAMIAN, featuring a square with a diagonal line from the top-left to the bottom-right, and the word "FRAMIAN" in a blue, uppercase, sans-serif font below.The logo for GOPA, featuring the word "GOPA" in a bold, green, uppercase, sans-serif font, with "WORLDWIDE CONSULTANTS" in a smaller, green, uppercase, sans-serif font below.

The SBS survey deadline for submission to Eurostat is 18 months after the end of the year whereas DG MARE deadline is earlier. Having the same deadline for the submission of data on fish processing industry in SBS and DCF would reduce the burden and increase coherence of series.

Formats and content

Commission Regulation (EC) No 250/2009 of 11 March 2009 specifies that MS have to send data files with a predefined format to Eurostat. Each series of data has to be sent in a different file.

The breakdown by level of activity encompasses up to 4-digit level, and therefore the fish processing activity (NACE Rev.2 class C10.2.0 “Processing and preserving of fish, crustaceans and molluscs”) has no further breakdown.

The contents of the data upload reflects the requirements of the SBS, which is different with that of the DCF with respect to the economic variables that have to be collected on the fish processing industry (see table 104 below).

Table 104. Similarities and differences between JRC and Eurostat requests of variables on fish processing industry.

Eurostat	JRC
Same variable requested	
Number of enterprises (11 11 0)	Number of enterprises (by size)
Turnover (12 11 0)	Turnover
Personnel costs (13 31 0) Wages and salaries (13 32 0)	Personnel costs – Wages and salaries of staff
Gross investment in tangible goods (15 11 0) Sales of tangible investment goods (15 21 0)	Net investments
Number of personnel employed (16 11 0)	Number of persons employed (by gender)
Nuber of employees in FTE units (16 14 0)	FTE National
Purchases of energy products (in value) (20 11 0)	Energy costs
Different variables requested	
Number of local units (11 21 0) Nuber of kind of activity units (11 31 0) Production value (12 12 0) Gross margin on goods for resale (12 13 0) Value-added at factor cost (12 15 0) Gross operating surplus (12 17 0) Total purchases of goods and services (13 11 0) Purchases of goods and services purchased for resale in the same condition as received (13 12 0) Payments for ageny workers (13 13 1) Change in stocks of finished products and work in progress manufactured by the unit (13 21 3) Social security costs (13 33 0) Payments for long-term rental and operational leasing of goods (13 41 1) Gross investment in land (15 12 0) Gross investment in existing buildings and structures (15 13 0) Gross investment in construction and alteration of buildings (15 14 0) Gross investment in machinery and equipment (15 15 0) Number of employees (16 13 0) Number of hours worked by employees (16 15 0) Turnover of hours worked by employees (16 15 0) Turnover from the principal activity (18 11 0) Investment in equipment and plant for pollution, control and special anti-pollution accessories (21 11 0) Investment in equipment and plant linked to cleaner technology (21 12 0)	Subsidies Other income Imputed value of unpaid labour Raw material costs Other operational costs Finnical costs, net Extraordinary costs, net Capital value – Total value of assets Debt Depreciation of capital

Given that the agreed format is used for all other activities, it seems difficult to envisage that data transmission is updated to include the additional variables collected by JRC as the fish processing industry is a very small part of the SBS data collection.

3.8.3.c – Eurobase dissemination database

Upload of data in Eurobase

The data files to be uploaded are prepared within the production environments (*Eurocube* for fish processing industry and MDT for the other fisheries data) using specifically developed extraction function or tool preparing files in the predefined format agreed for the domain and tables to be uploaded in Eurobase.

The data are made confidential and the foreseen aggregates (yearly aggregates, species group aggregates, FAO higher level aggregates, EU aggregates, etc.) generated directly in the production environment so that the files will be ready to be disseminated in *Eurobase*.

The control at Eurobase level is mostly file structure control.

1.8.4. Quality Control

Data validation

Data validation for fleet

As declared at the Fisheries Statistics Working Group of October 2013¹⁰³, Eurostat wishes to be involved in the assessment of the fleet data prior to proceed with its official dissemination in Eurobase. In order to be able to disseminate fleet data from DG MARE records, Eurostat and is currently revising its Eurobase tables for the fleet domain, so that they can accommodate more detailed breakdowns for vessel size (measured either by length, tonnage or power) and for gear. This work is on-going.

Data validation for MDT

The MDT principle is to share the same kind of test functions on different datasets. The checks described below are available for aquaculture, catches and landings.

¹⁰³ Document: FISH 337

Table 105. Summary of validation processes and quality checks in database X¹⁰⁴

Check	Manual/ software	Catch	aquaculture	landing
Format (SDMX ML autoloader) or txt for historical data	soft	X	X	X
Existence of codes	soft	X	X	X
Duplication of data (region, species, year)	soft	X	X	X
Outliers (median +/- 50%)	soft	X	X	X
Reported species for the area (first time species is encountered, MS is requested to confirm)	soft	X	x	X
Species/production method	soft		X	
o values not accepted	soft	X	X	X
Quantity without values or reverse	soft	x	x	x

Source: Feasibility study

Errors detected must be copied manually in an Excel file to be reported to MS, no automated error report. No possibility to comment a data (metadata) to document a specific inconsistency.

Data validation for fish processing - EBB

An EBB domain was designed for being used for processing SBS data and the corresponding validation rules have been implemented.

MS have to submit quality reports on SBS statistics to Eurostat.¹⁰⁵ They include, under an agreed report format, methodological information on the stages of data collection, data processing and data output (including the calculated accuracy measures). These reports are a good practice of the ESS that could be replicated for fisheries data. In addition, several MS use the same SAS macro (CLAAAN) to calculate such accuracy measures (the macro was developed by Statistics Sweden), thus showing another example of good practice in sharing software tools.

Data validation for EUROBASE

None. It is limited to upload formats.

Storage of quality indicators

As per the responses from MS (National Coordinators) to the questionnaire sent during the information collection phase, very few of them store the quality indicators in a database. However, the publication of comprehensive quality reports provides an adequate substitute.

¹⁰⁴ MDT support is currently working on a detailed description of the current rules implemented

¹⁰⁵

http://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=LST_NOM_DTL&StrNom=NAT_SBS&StrLanguageCode=EN&IntPcKey=25916090&StrLayoutCode=HIERARCHIC contains the reports until 2005.

1.8.5. Dissemination

The reference data are prepared from MDT and Eurocube and uploaded in the dissemination database (Eurobase) through a semi-automated process.

Confidentiality

Aquaculture:

Confidentiality is applied to aquaculture data where the MS has the possibility to apply a confidential flag on each record directly in the detailed data.

The Eurostat approach for managing the confidentiality in aquaculture is the “killer approach”: if a value is confidential, meaning no aggregated data will be built for dissemination if one of the records in the aggregate is confidential. Eurostat is investigating on how to make the rules a bit more flexible or directly request the MS to make confidential the data to be able to publish more data.

The confidentiality rules are applied directly in MDT and data available in Eurobase are already made confidential.

Fish processing:

The confidentiality rules applied for SBS survey data are also in force for the fish processing industry being part of this survey. There are two main confidentiality rules:

- The number of enterprises being combined in an aggregate should be larger than a threshold (“frequency rule”);
- The aggregates should not include a “dominant” value, account for more than a specific percentage of the total (“dominance rule”).

The flag indicating confidentiality of an aggregate is assigned by the MS producing the data, so that this information is already transmitted to Eurostat as confidential.

Restricted (WGs), including confidentiality

Not relevant – disseminated data are publicly available.

Public

The main source of data for the public is the Eurobase, which is publicly available.

Technical functionalities for the dissemination database

Eurobase allows browsing almost all data published at Eurostat web site

Fisheries data are accessible at:

<http://epp.eurostat.ec.europa.eu/portal/page/portal/fisheries/introduction>

Two kinds of data presentation are made available to the public for fisheries statistics at this web address:

- **Main fixed tables:** on fishery production in all fishing regions (- Tonnes live weight), Catches total and specified regions (Tonnes live weight), Aquaculture (Tonnes and euro), Fishing fleet tables (total engine, total tonnage, total number of vessels) are proposed. The fixed table formats are not static as they are extracted on the fly from the Eurobase database meaning data provided are always up to date but the extraction parameters are limited. Tables mainly consist in crossing the geographical zone by period. The output proposed can be customised by applying filter, visualising the result in graph or map.
- **Eurobase database:** allowing performing interactive extractions with more customised selection parameters. The size of the extraction results is limited but bigger extraction can be obtained if needed. The different views available are
 - Fish_pr related to total production summing catches and aquaculture information.
 - Fish_ca related to catches with the dimensions fishing area, MS , species, time (being year) and indicator as weight in tonnes
 - Fish_aq related to aquaculture with dimensions on aquaculture environment (fresh water, sea...), aquaculture method, fishing area, MS, species, time and indicators as volume in tonnes, values in euro, production in millions, and structure in m³.
 - Landing with the dimensions destination (human consumption..), MS, flag of the vessel, presentation (fresh, cooked), species , time and indicator as value in euro and weight in tonne
 - Fleet: with the dimensions MS, time, vessel size (age, power, tonnage, % tonnage, length) number, gross tonnage, kW. This is not updated since 2010.

SBS data on fish processing industries are available at:

<http://epp.eurostat.ec.europa.eu/portal/page/portal/fisheries/introduction>.

They follow the same presentation for other economic sectors. From Eurobase, it is possible to export results in xls, csv, html, PC-Axcis, SPSS, tsv, PDF.

1.8.6. Institutional Considerations

Legal

General legislation

European statistics are governed by a set of EU legislative acts. This legislation applies to Member States (MS) whose national statistical programmes should reflect the EU requirements.

The legal base of the European Statistics is set by Regulation (EC) No 223/2009¹⁰⁶ of the European Parliament and of the Council of 11 March 2009 (Official Journal of 21.03.2009), which in particular updates the Council Regulation (EC) No 322/97 on Community Statistics, and other relevant acts. Regulation 223/2009 establishes the European Statistical System (ESS) as the partnership between Eurostat, the national statistical institutes (NSIs) of the Member States and other national authorities responsible for the development, production and dissemination of European statistics. It also establishes its governance, centred on the European Statistical System Committee (ESS Committee) composed of representative of the NSIs and of Eurostat.

The statistical activity at the EU level is based on the European or Community Statistical Programme (CSP) which provides the framework for the development on a multi-annual basis (five years). The current European Statistical Programme covers 2013-2018.

Legislation on fisheries statistics

Fisheries (Catches, Landings, Aquaculture and Fleet)

http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Fishery_statistics

Data are collected using internationally agreed concepts and definitions developed by the coordinating working party on fishery statistics (CWP). It refers to the fishing fleet size on 31 December of the reference year and is derived from national registers of fishing vessels which are maintained pursuant to [Regulation 26/2004](#), which contains information on the vessel characteristics. The administrative file of fishing vessels is maintained by the European Commission's Directorate-General for Maritime Affairs and Fisheries.

SBS (Processing industry)

http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Structural_business_statistics_overview

Structural business statistics are compiled under the legal basis provided by Parliament and Council [Regulation 295/2008](#) on structural business statistics, and in accordance with the

¹⁰⁶ Available at: http://epp.eurostat.ec.europa.eu/portal/page/portal/about_eurostat/documents/1_EN_ACT_part1_v2.pdf

definitions, breakdowns, deadlines for data delivery, and various quality aspects specified in the regulations implementing it.

While under DCF it is mandatory to collect some processing data for enterprises that carry out fish processing even if not as a main activity (Commission Decision 2010/93/EU), under SBS data on secondary activities is not collected. Enterprises that are active in more than one economic activity are classified under the NACE heading according to their principal activity.

Specific legislation

Catches

- [Regulation 216/2009](#) (areas other than those of the North Atlantic)
- [Regulation 217/2009](#) (North-West Atlantic)
- [Regulation 218/2009](#) (North-East Atlantic)

Landings

- [Regulation 1921/2006](#)

Aquaculture

- [Regulation 762/2008](#)

Fleet

Characteristics of fishing vessels

- [Regulation 2930/86](#)
- [Regulation 3259/94](#) (amending the Regulation 2930/86)

Community fishing fleet register

- [Regulation 26/2004](#)
- [Regulation 1799/2006](#) (amending the Regulation 1799/2006)

Processing industry (SBS)

- [Regulation 295/2008](#)

Key implementing legislations

- Data series: [Regulation 251/2009](#)
- Definitions: [Regulation 250/2009](#)

Administrative

Guarantee of confidentiality

It can be said that the role of Eurostat is manifold with respect to fishery statistics:

- on one side, it compiles and validates data from the MS and disseminates them in a harmonized way;
- it provides a forum for national statistical authorities to discuss the methodology for fishery statistics, mainly through its Working Party on Fishery Statistics;
- in its role as statistical office of the European Union, has the mandate of coordinating the European Statistical Programme¹⁰⁷ (of which the current one covers 2013-2017). In particular, its objective 3.3.4 mentions the provision of data for the CFP. The European Statistical Programme 2013-2017 requires “the association of Eurostat with all Commission initiatives with regard to statistical aspects at an early stage”.

Objective 3.3.4

Provide agriculture, fisheries and forestry statistics for the development and monitoring of the Common Agricultural and Fisheries Policies, reflecting key European strategic objectives related to sustainability as well as rural development by carrying out regular activities related to the development, production and dissemination of statistics.

In this sense, Eurostat has the legal and administrative capacity to coordinate the production and dissemination of European statistics, of which fishery statistics. The governance mechanisms in place include multi-annual programming (the European Statistical Programme), high-level decision bodies (the European Statistical System Committee, ESSC), user consultation (mainly through the European Statistical Advisory Committee, ESAC).

With respect to the access to confidential data, Eurostat can have access for statistical purposes (Articles 21, 24), subject to the protection of their confidentiality. This may provide a basis for the access by Eurostat to Control data if necessary. It guarantees the current access to fleet data. It can even provide access to confidential data for researchers under safe conditions.

The collaboration of Eurostat and DG MARE is on the agenda of both institutions, especially with the launching of the Aggregate Catch Data Reporting System at DG MARE which could satisfy Eurostat needs through the regular reports collected by DG MARE. Depending on the comparison of data from 2011 and 2012, 2014 catch data should be comparable by using the new ACDR. This could simplify the current collection set up by avoiding double reporting from MS.

¹⁰⁷ REGULATION (EU) No 99/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 January 2013 on the European statistical programme 2013-17.

A hearing of responsible Directors should take place by November 2013. It should discuss about the reinforcement of the cooperation between both DGs. This meeting should be the opportunity to progress on the preparation of a Memorandum of Understanding (MoU) between the Director Generals of MARE and ESTAT to be signed between the end of 2013 and the beginning of 2014. At the time of this report, the results of the hearing are not available.

Adaptation of statutes for confidentiality

Not applicable/necessary.

Financial

Funding

The total budget of the European Statistical Programme 2013-2018 is EUR 299.4 Million. Eurostat can in addition manage delegated funds from the budget of other DGs.

Staff and Budget for DB development

Eurostat staff for the management of IT tools is limited:

- Unit B2(catch landing and aquaculture): 1 person + 1 external
- MDT: 1 external staff contractual dedicated to fisheries (correction of errors, improvement), support for the
- Eurobase: internal in house staff

There is no internal development, but it is outsourced. There is a risk of ownership as part of the production process (rules definition) is under the responsibility of the contractor.

1.9. Interactions between DCF data, CR data and other fisheries related data

1.9.1. Interactions with Marine Strategy Framework Directive (MSFD) and Integrated Maritime Policy (IMP)

General description of the MSFD

Legal Basis, Subject and Objective

Full name of the Marine Strategy Framework Directive (MSFD) is “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”. Purpose of the MSFD is to establish a framework within which MS shall take the necessary measures to achieve or maintain good environmental status (GES) in the marine environment by the year 2020 at the latest.

For that purpose, marine strategies shall be developed and implemented in order to:

- a. protect and preserve the marine environment, prevent its deterioration or, where practicable, restore marine ecosystems in areas where they have been adversely affected;
- b. prevent and reduce inputs in the marine environment, with a view to phasing out pollution as defined in Article 3(8), so as to ensure that there are no significant impacts on or risks to marine biodiversity, marine ecosystems, human health or legitimate uses of the sea.

MSFD “is the environmental pillar of the Integrated Maritime Policy” (Commission Decision 2010/477/EU, recital 6) and requires the application of the ecosystem approach to the management of human activities, covering all sectors having an impact on the marine environment. It shall contribute to coherence between, and aim to ensure the integration of environmental concerns into the different policies, agreements and legislative measures which have an impact on the marine environment (Article 1). Accordingly,

- While IMP is an overarching policy for all issues related to the sea and falls, on EU level, under DG MARE.
- MSFD is an instrument of environment policy and falls under the responsibility of DG Environment and, on MS level, usually under that of the corresponding (environmental) government departments. Nevertheless, it is also a cross-cutting issue which concerns a number of policies, including fisheries policy.

Regional scope

The MSFD refers to marine waters under the sovereignty and jurisdiction of EU MS, which are part of the following marine regions:

- a. the Baltic Sea;
- b. the North-East Atlantic Ocean;
- c. the Mediterranean Sea;
- d. the Black Sea

and their sub-regions.

Due to the transboundary nature of the marine environment and since regions and subregions are shared both with other MS and with third countries, MS are called upon to coordinate closely with other MS and third countries in implementing the MSFD.

Steps and elements

For each of the marine regions or sub-regions they share, MS have to:

- undertake an initial assessment of the current environmental status of the waters concerned and the environmental impact of human activities (by 15 July 2012)
- determine a good environmental status for the waters concerned (by 15 July 2012)
- establish a series of environmental targets and associated indicators (by 15 July 2012)
- establish and implement a monitoring programme for ongoing assessment and regular updating of targets (by 15 July 2014)
- develop (by 2015 at the latest) a programme of measures designed to achieve or maintain good environmental status (entry into operation of the programme by 2016 at the latest) (see Art. 5 MSFD).

Descriptors and indicators used under MSFD

Annex I of the MSFD lists 11 qualitative descriptors, which MS shall consider for the description of a good environmental status (according to Article 9 (1) and Annex I of the MSFD).

Table 106. MSFD Qualitative Descriptors for determining a good environmental status

No	Descriptor
1.	Biological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions;
2.	Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystems;
3.	Populations of all commercially exploited fish and shellfish are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock;
4.	All elements of the marine food webs, to the extent that they are known, occur at normal abundance and diversity and levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive capacity:
5.	Human-induced eutrophication is minimised, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algae blooms and oxygen deficiency in bottom waters;
6.	Sea-floor integrity is at level that ensures that the structure and functions of the ecosystem are safeguarded and benthic ecosystems, in particular, are not adversely affected;
7.	Permanent alteration of hydrographical conditions does not adversely affect marine ecosystems;
8.	Concentrations of contaminants are at levels not giving rise to pollution effects;
9.	Contaminants in fish and other seafood for human consumption do not exceed levels established by Community legislation or other relevant standards;
10.	Properties and quantities of marine litter do not cause harm to the coastal and marine environment;
11.	Introduction of energy, including underwater noise, is at levels that do not adversely affect the marine environment.
	<i>directly connected to DCF</i>
	<i>some connection to DCF</i>

MS are obliged to consider all 11 descriptors for the description of a GES of each of the marine regions or subregions they share, but if they find one or more descriptors not appropriate for any of their marine waters, they may notify the Commission accordingly.

The descriptors are qualitative in nature and were not defined very precisely by Annex I of the MSFD. Annex III of the same directive provided an indicative list of characteristics, pressures and impacts to be considered in the initial assessment and the description of the good environmental status, but also these did not constitute sound methodological basis for assessments. Hence, a need to develop additional scientific understanding for assessing good environmental status was identified. As a consequence, Commission Decision 2010/477/EU on criteria and methodological standards on good environmental status of marine Waters was taken and published. This provides:

- criteria to be used by the Member States to assess the extent to which good environmental status is being achieved, accompanied with references to applicable methodological standards where available, for each of the 11 descriptors, and
- a set of indicators for each of the above mentioned criteria. The indicators can also be used for monitoring purposes.

Relation between MSFD indicators and DCF

The following table describes the relation of MSFD descriptors, criteria and indicators (as defined by Commission Decision 2010/477/EU) to DCF, on the level of each relevant MSFD indicator.

Table 107. Descriptors, criteria and indicators with relation to DCF and relevant data sources

Indicator	Relation to DCF
Descriptor 1: Biological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climate conditions.	
Criterion 1.2: Population size	
Indicator 1.2.1: Population abundance and/or biomass, as appropriate	<ul style="list-style-type: none"> • Analytical stock assessment based on data collected under DCF (contribution concerning commercial fish species as some among the wide range of plant and animal species or communities considered; see Table 1 of Annex III to Directive 2008/56/EC). • Environmental indicator 1, Conservation status of fish species, of Appendix III of 2010/93/EU.
Criterion 1.3: Population condition	
Indicator 1.3.1: Population demographic characteristics (e.g. body size or age class structure, sex ratio, fecundity rates, survival/ mortality rates)	Analytical stock assessment based on data collected under DCF (contribution concerning commercial fish species as some among the wide range of plant and animal species or communities considered.)
Criterion 1.6: Habitat condition	
Indicator 1.6.1: Condition of the typical species and communities	Analytical stock assessment based on data collected under DCF (contribution concerning commercial fish species as some among the wide range of plant and animal species or communities considered.)
Indicator 1.6.2: Relative abundance and/or biomass, as appropriate	
Criterion 1.7: Ecosystem structure	
Indicator 1.7.1: Composition and relative proportions of ecosystem components (habitats and species)	<ul style="list-style-type: none"> • Analytical stock assessment based on data collected under DCF (contribution concerning commercial fish species as some among the wide range of plant and animal species or communities considered.) • Environmental indicator 2, Proportion of large fish, of Appendix III of 2010/93/EU (contribution concerning commercial fish species). • Environmental indicator 3, Mean maximum length of fishes, of Appendix III of 2010/93/EU (contribution concerning commercial fish species).

Indicator	Relation to DCF
Descriptor 2: Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystem	
Criterion 2.1: Abundance and state characterisation of non-indigenous species, in particular invasive species	
Indicator 2.1.1: Trends in abundance, temporal occurrence and spatial distribution in the wild of non-indigenous species, particularly invasive non-indigenous species, notably in risk areas, in relation to the main vectors and pathways of spreading of such species	Partial contributions possible, e.g. as based on results of research cruises; in general, however, DCF covers only indigenous species of the regions under consideration.
Criterion 2.2: Environmental impact of invasive non-indigenous species	
Indicator 2.2.1: Ratio between invasive non-indigenous species and native species in some well studied taxonomic groups (e.g. fish, macroalgae, molluscs) that may provide a measure of change in species composition (e.g. further to the displacement of native species)	Analytical stock assessment based on data collected under DCF can contribute with data and information on native species, as the species covered by DCF are certainly among the well studied taxonomic groups mentioned in the indicator.
Descriptor 3: Populations of all commercially exploited fish and shellfish are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock.	
Criterion 3.1.: Level of pressure of the fishing activity	
Indicator 3.1.1: Fishing mortality (F) (Primary indicator)	Analytical stock assessment done by ICES, GFCM, STECF, ICCAT on data collected under DCF, 199/2008
Indicator 3.1.2: Ratio between catch and biomass index (Secondary indicators, if analytical assessments yielding values for F are not available)	Data collected under DCF, 199/2008
Criterion 3.2.: Reproductive capacity of the stock	
Indicator 3.2.1: Spawning Stock Biomass (SSB) (Primary indicator)	Analytical stock assessment done by ICES, GFCM, STECF, ICCAT on data collected under DCF, 199/2008
Indicator 3.2.2: Biomass indices Secondary indicators (if analytical assessments yielding values for SSB are not available)	National and international data collection and monitoring programs under DCF 199/2008
Criterion 3.3.: Population age and size distribution	
Indicator 3.3.1: Proportion of fish larger than the mean size of first sexual maturation (Primary indicator)	National and international data collection and monitoring programs under DCF 199/2008
Indicator 3.3.2: Mean maximum length across all species found in research vessel surveys (Primary indicator)	

Indicator	Relation to DCF
Indicator 3.3.3: 95 % percentile of the fish length distribution observed in research vessel surveys (Primary indicator)	
Indicator 3.3.4: Size at first sexual maturation, which may reflect the extent of undesirable genetic effects of exploitation (Secondary indicator)	<ul style="list-style-type: none"> National and international data collection and monitoring programs under DCF 199/2008 Environmental indicator 4, Size at maturation of exploited fish species, of Appendix III of 2010/93/EU.
Descriptor 4: All elements of the marine food webs, to the extent that they are known, occur at normal abundance and diversity and levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive capacity	
Criterion 4.1: Productivity (production per unit biomass) of key species or trophic groups	
Indicator 4.1.1: Performance of key predator species using their production per unit biomass (productivity)	Partial contributions possible, e.g. from analytical stock assessment based on data collected under DCF.
Criterion 4.2: Proportion of selected species at the top of food webs	
Indicator 4.2.1: Large fish (by weight)	Partial contributions possible concerning commercial species, e.g. <ul style="list-style-type: none"> results of research cruises or from analytical stock assessment based on data collected under DCF Environmental indicator 2, Proportion of large fish, of Appendix III of 2010/93/EU
Criterion 4.3: Abundance/distribution of key trophic groups/species	
Indicator 4.3.1: Abundance trends of functionally important selected groups/species	Partial contributions possible concerning commercial species, e.g. results of research cruises or from analytical stock assessment based on data collected under DCF.
Descriptor 6: Sea-floor integrity is at a level that ensures that the structure and functions of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected	
Criterion 6.1: Physical damage, having regard to substrate characteristics	
Indicator 6.1.2: Extent of the seabed significantly affected by human activities for the different substrate types	Environmental indicator 7, Areas not impacted by mobile bottom gears (Appendix III of 2010/93/EU) may be used as one among several data sources.

based on:

- JRC (2012), *Monitoring for the Marine Strategy Framework Directive: Requirements and options, Annex: MSFD Descriptors and related indicators in relation to required parameters from other legislation*;
- JRC Joint Research Centre – Institute for Environment and Sustainability (2011): *Review of Methodological Standards Related to the Marine Strategy Framework Directive Criteria on Good Environmental Status*. Piha Henna, Zampoukas Nikolaos.
- ICES Advisory Committee (2012): *Marine Strategy Framework Directive, MSFD D3 REPORT - Descriptor 3+ Table 8.1.1 / p. 129*.

As a result, we can conclude that the indicators and criteria related to Descriptor 3 are based:

- directly on DCF data, or possibly also similar data from other sources where available (e.g. landing data may be used as transversal data from DCF or from other sources);
- on analytical stock assessment done by ICES, GFCM, STECF, ICCAT, which is exclusively or predominantly based on data collected under DCF (other sources such as surveys not covered by DCF may in some cases also be considered).

This direct link between DCF and descriptor 3 on commercially exploited fish and shellfish is indeed explicitly mentioned in Commission Decision 2010/477/EU, which explains in the context of this descriptor: “This Section applies for all the stocks covered by Regulation (EC) No 199/2008 (within the geographical scope of Directive 2008/56/EC) and similar obligations under the common fisheries policy. For these and for other stocks, its application depends on the data available (taking the data collection provisions of Regulation (EC) No 199/2008 into account), which will determine the most appropriate indicators to be used.” Hence, it explicitly defines a link to DCF as a data source.

The relation between descriptors 1, 2, 4 and 6 on the one and DCF on the other hand is much less direct. In most cases DCF or any assessment based on DCF data can only contribute data and information on aspects related to commercial fish stocks and fisheries, as some among a wide variety of species and activities considered.

It seems also important to point out that MSFD indicators may be used at different stages and for different purposes, in particular for the description of the present situation, the GES and for monitoring. For the assessment of a GES data and information on the present situation (such as e.g. the present fishing mortality (F) or spawning stock biomass (SSB)) are compared to certain target values. Commission Decision 2010/477/EU often links the criteria for GES to MSY as a benchmark, e.g. by defining that “Achieving or maintaining good environmental status requires that F values are equal to or lower than F_{MSY} , the level capable of producing Maximum Sustainable Yield (MSY)”. The decision also mentions some methodological problems in this context, which cannot be discussed here. It should be noted, however, that an assessment of MSY or related target values may require more data or longer time series than the pure assessment of present F, SSB or other parameter.

There are some further, but less direct connections between DCF data and MSFD, which do not relate to the descriptors. In the initial assessment under MSFD, MS for instance have to undertake an economic and social analysis of the use of those waters (according to Article 8.1.c of MSFD). For this purpose, they may utilize economic data on fisheries and aquaculture from DCF. Realistically, however, DCF data will be only one among many data sources for this purpose – if considered at all.

It should also be mentioned that for the moment, data transmission is required only in one direction, from DCF to MSFD. It might be possible that in future fisheries data collection or, more

generally, assessments in the context of the common fisheries policy also take into consideration data collected, transmitted and/or stored under MSFD (e.g. on marine food webs), but no formalized requirements in this respect are presently known.

Data sources and utilization

Data sources

While the above chapter discussed which types of data collected under DCF or which analyses based on such data are needed for MSFD indicators, of interest in the scope of our study is in particular where these data are stored and how they are accessible.

As a basis for this, it shall be recalled that the reporting obligations under MSFD rest with MS, which have to report separately for each marine region or subregion that their territorial waters are part of. Many of the issues concerned are of transboundary nature, e.g. the state of most fish stocks. On the other hand, a few aspects have a precise geographic dimension, such as the impact of human activities on the seabed, which can be clearly delimited for territorial waters of a MS.

Recital 13 of MSFD stipulates in this context: “By reason of the transboundary nature of the marine environment, Member States should cooperate to ensure the coordinated development of marine strategies for each marine region or subregion. Since marine regions or subregions are shared both with other Member States and with third countries, Member States should make every effort to ensure close coordination with all Member States and third countries concerned. Where practical and appropriate, existing institutional structures established in marine regions or subregions, in particular Regional Sea Conventions, should be used to ensure such coordination.”

For aspects of commercial fishing and fish stocks, DCF and the institutions dealing with it are certainly relevant existing institutional structures (as discussed above in the context of descriptor 3).

The required DCF data, as identified in the preceding chapter, are in most cases transmitted by the MS to ICES, RFMOs, RSCs (as far as know only in case of HELCOM) or other organisations. Some of these organisations and their working groups also carry out the analytical stock assessment, which is needed as a basis for some of the MSFD indicators. Hence, the databases of such organisations – described in other parts of this study – are the primary sources of the required data.

European Commission. 2012. *Guidance for 2012 reporting under the Marine Strategy Framework Directive, using the MSFD database tool. Version 1.0.* DG Environment, Brussels. Pp. 164 describes this as follows:

“For fishing, it is likely that information from the International Council for Exploration of Sea (ICES) and General Fisheries Commission for the Mediterranean (GFCM) will be relevant for reporting for a number of Member States. It should be noted that it is the responsibility of Member States to report under the Directive, but they may use information from ICES, GFCM or the RSCs where appropriate. It is up to Member States to decide what the appropriate scale is for reporting on fishing (and other selective extraction activities) for their marine waters, nothing that Member States can report at the regional, subregional or other appropriate level, using ICES or GFCM data, by defining suitable assessment areas”.

This can be illustrated with the help of the following example: In an exploratory manner, Probst et al have undertaken an assessment of the good environmental status of commercial 43 species of the North Sea, based on MSFD Descriptor 3 and its indicators.¹⁰⁸

Table 108. Data sources used by Probst et al. for the assessment of Descriptor 3

Type of data	download source / link ¹⁰⁹	final data source / relation to DCF
International Bottom Trawl Survey (IBTS)	ICES Datras portal, http://datras.ices.dk	IBTS is part of DCF
Data from stock assessments	ICES stock assessment summary database; http://ices.dk/marine-data/dataset-collections/Pages/Fish-catch-and-stock-assessment.aspx for the overview and http://infoices.dk/datacentre/StdGraphDB/FishStockDB.mdb for the database	DCF is one important data source of stock assessments
Data on commercial landings	ICES catch statistics homepage; http://ices.dk/marine-data/dataset-collections/Pages/Fish-catch-and-stock-assessment.aspx for the overview or http://www.ices.dk/marine-data/dataset-collections/Documents/ICES1950-2010.zip and http://www.ices.dk/marine-data/Documents/ICES1992-2011.zip (more recent data) for the data sets.	officially submitted by 20 ICES member countries; collected and coordinated in collaboration with EUROSTAT ¹¹⁰

Source: Probst et al, p. 695

¹⁰⁸ see Probst, W. N., Kloppmann, M., and Kraus, G. Indicator-based status assessment of commercial fish species in the North Sea according to the EU Marine Strategy Framework Directive (MSFD). – *ICES Journal of Marine Science*, 70: 694–706.

¹⁰⁹ updated, as the link given in the paper was outdated.

¹¹⁰ see <http://www.ices.dk/marine-data/dataset-collections/Pages/Fish-catch-and-stock-assessment.aspx>

We can see that ICES and its (publically accessible) databases were the principal data sources in this case, and that:

- DCF data
- Stock assessments based on DCF data
- Landing data which are originally collected under control regulations and statistical reporting requirements, but which are also part of DCF as transversal variables

could be found in these databases. The relevant data sources may, however, be different ones for other marine regions and fish stocks. It should also be mentioned that Probst at al. could find sufficient data only for 43 out of 61 potential stocks for the assessment of descriptor 3.

Methodological aspects

While Commission Decisions 2010/477/EU gives some guidance on methods to be applied for the generation of individual indicators and while some indicators may be based on established methods, there are still a number of open methodological questions in the context of MSFD indicators. Some of these problems and related research needs are even mentioned in Commission Decisions 2010/477/EU (e.g. in the context of SSB_{MSY} in a multispecies environment with interactions between stocks).

ICES explains in this context that when “indicators are used for formal assessments it is highly desirable that independent workers should be able to repeat calculations and reach the same values. However it is often difficult for different groups to calculate identical indicator values even when working on the same dataset and when all groups are applying the same protocols.”¹¹¹

As a consequence, there have been several initiatives by ICES, JRC to further elaborate and standardize the methods applied for fisheries assessments¹¹², and by Regional Sea conventions to coordinate and harmonize e.g. the definition of indicators and description of a GES by their member states which are also EU MS.¹¹³

¹¹¹ ICES (2012): Marine Strategy Framework Directive - Descriptor 3+ , ICES CM, 2012/ACOM:62. p. 130

¹¹² see e.g. JRC (2011), Review of Methodological Standards Related to the Marine Strategy Framework Directive Criteria on Good Environmental Status

JRC (2012): Monitoring for the Marine Strategy Framework Directive: Requirements and Options. Authors: Nikolaos Zampoukas, Henna Piha, Emanuele Bigagli, Nicolas Hoepffner, Georg Hanke & Ana Cristina Cardoso;

JRC: various task group reports on individual descriptors available at <http://www.ices.dk/news-and-events/themes/Pages/MSFD%20Documents.aspx>; among these MSFD Task Group 3 Report: Commercially exploited fish and shellfish, March 2010, G. J. Piet, A. J. Albella, E. Aro, H. Farrugio, J. Lleonart, C. Lordan, B. Mesnil, G. Petrakis, C. Pusch, G. Radu & H.-J. Rätz. <http://www.ices.dk/news-and-events/Documents/Themes/MSFD/TG3%20FINAL%20REPORT.pdf>;

ICES (2012): Marine Strategy Framework Directive - Descriptor 3+ , ICES CM, 2012/ACOM:62. 173 pp.

ICES Council Meeting; October 2012; CM Del-04.1. Integration of fisheries surveys and environmental monitoring http://www.ices.dk/news-and-events/Documents/Themes/MSFD/CM_2012_Del-04.1_surveys_integrated_monitoring.pdf

¹¹³ see e.g. HELCOM GEAR Group (2012): Baltic Sea Roof Report - Overview of the reporting by Baltic Sea EU member states for Articles 8, 9 and 10 of the Marine Strategy Framework Directive and HELCOM's activities as the regional coordination platform <http://www.envir.ee/orb.aw/class=file/action=preview/id=1195102/Room+Report+FINAL.pdf>

In parallel, there are initiatives to modify existing MSFD indicators.¹¹⁴ All this shows that MSFD is still a young instrument and a certain standardization and consolidation has to be expected for the coming years.

Such methodological issues will have repercussions on the data needed – as different methods need different data, and the availability of data may have consequences for the methods that can be applied.

It should also be pointed out that the main and most regular need for data under MSFD will be in the context of monitoring programmes, and MS have to establish and implement their monitoring programmes only by 15 July 2014. Hence, many things are still in development and the exact need for data cannot be determined at this point in time.

Institutional issues

As mentioned earlier, from an institutional perspective fisheries data collection usually falls under fisheries policy and the related administration, i.e. under DG MARE on EU level and respective ministries, agencies and institutes at national level, while MSFD falls under environmental policy and institutions.

This requires that DCF data generated under fisheries policy as well as results of stock assessment and other scientific work done on the basis of such data find their way into the reporting under MSFD. In the scope of this study, we could not investigate in detail how DCF data are passed on the national level from fisheries to environment policy institutions. From individual examples, it seems that in particular for descriptor 3, which is directly linked to DCF and concerns classical fish stock assessment and related tasks, the same fisheries-related institutions – and in fact the same scientists – deal with processing of the data for indicators under this descriptor and only the results are passed on to the environmental institutions that usually hold the overall responsibility for MSFD reporting.¹¹⁵ Often, such scientists are members of STECF, ICES, or RFMO working groups. Hence, full access to DCF data and assessments produced on their basis seems provided at this level. This appears to be an obvious solution, as clearly more than a pure transmission of data is required (and it would make no sense to grant environmental institutions access to DCF databases and let them produce their own fish stock assessments on that basis.)

OSPAR Commission (2012): *Finding common ground - Towards regional coherence in implementing the Marine Strategy Framework Directive in the North-East Atlantic region through the work of the OSPAR Commission.* http://www.ospar.org/documents/dbase/publications/p00578/p00578_MSFD%20report.pdf

¹¹⁴ see e.g. ICES Special request, Advice June 2013, 1.5.2.1 Request from EU for Scientific advice on data collection issues, http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/Special%20requests/EU_%20data_%20collection_issues.pdf

ICES (2012): *Marine Strategy Framework Directive - Descriptor 3+*, ICES CM, 2012/ACOM:62. p. 130

¹¹⁵ MRAG Consortium (2012) explains in this context: “The MSFD has requirements which coincide with that collected under the biological, survey and marine ecosystems elements of the DCF although it is not clear whether environment authorities compiling MSFD data could get access to this data from the fisheries authorities.” (p. 50).

The situation seems much more complex where individual DCF data or findings based on them may enter into much wider assessments of the environmental status, in particular under descriptors 1, 2, 4 and 6. It has to be assumed for the moment that solutions for such situations may differ from case to case and MS to MS, in some cases they possibly have not even been established yet.

Another institutional aspect is that DCF data are usually collected on the national level and then uploaded to and analysed at a supranational level. MSFD reporting again is a national obligation, which however refers to transboundary waters and stocks. As described above, institutions such as ICES or JRC do a lot to coordinate the respective work, but only full coordination can avoid duplication of work. This applies also to some issues that clearly fall into territorial waters, such as impacts on the sea bottom: Every MS needs full information on the fishing effort of vessels from other MSs in its waters (e.g. VMS and logbook data etc.) for an assessment. A well-coordinated work may increase efficiency also in this case.

Reporting and data upload

Reporting obligations

The MSFD constitutes various reporting obligations for the MS, in particular¹¹⁶:

- a. Article 8 – initial assessment;
- b. Article 9 – determination of Good Environmental Status;
- c. Article 10 – environmental targets;
- d. Article 11 – monitoring programmes;
- e. Article 13 – programme of measures.

According to Article 19 of the MSFD, MS have to provide the Commission, the European Environment Agency (EEA) and the general public with reports and data compiled in implementing the MSFD. With regard to the general public, the MSFD provides that Directive 2003/4/EC on public access to environmental information shall apply, according to which such data generally have to be made publicly available.

Details of reporting under MSFD are coordinated and guided by a “Working Group on Data, Information and Knowledge Exchange (WG DIKE)”.

The nature of information to be reported under the Marine Directive includes “a mixture of text reports (e.g. transposition), assessment information (e.g. initial assessments), data and maps (e.g. initial assessments, monitoring data) and metadata (e.g. monitoring programmes).”¹¹⁷

¹¹⁶ see European Commission 2012: *Marine Strategy Framework Directive (MSFD): Common Implementation Strategy Approach to reporting for the Marine Strategy Framework Directive* (part of the “Reporting Package” under http://ec.europa.eu/environment/marine/docs/reporting_MSFD.zip)

¹¹⁷ see *Marine Strategy Framework Directive (MSFD): Common Implementation Strategy. Approach to reporting for the Marine Strategy Framework Directive*, June 2012

The system of reporting and data storage under MSFD is integrated in or developed in analogy to systems for other environment-related reporting obligations, “The Commission, together with the EEA and its member countries and third countries, is developing a Shared Environmental Information System (SEIS) to improve the collection, exchange and use of environmental data and information across Europe. SEIS aims to create an integrated web-enabled, EU-wide environmental information system, by simplifying and modernizing existing information systems and processes. For water-related directives, this is manifested in the Water Information System for Europe (WISE) and for biodiversity directives in the Biodiversity Information System for Europe (BISE). Reporting into these systems is handled via the EEA’s ReportNet system which acts as a reporting management service. The content of reports for each Directive is defined in a set of reporting obligations which are translated into ‘reporting sheets’, each giving guidance on the information and data needed and its format.

In keeping with Commission policy, the WISE system will form the main platform for technical reporting under the MSFD, with a specific module (WISE-Marine) developed to handle the information and data. This approach is familiar to Member States in their reporting under the related Water Framework Directive and other water directives.”¹¹⁸

Finally, the European environment information and observation network (EIONet) – of which the mentioned ReportNet is a part¹¹⁹ – serves as a repository of:

- documents and tools needed for reporting under MSFD; and
- reports and data uploaded by the MS.

EIONet is a partnership network of the European Environment Agency (EEA) and its member and cooperating countries. It consists of the EEA itself, six European Topic Centres (ETCs) and a network of around 1000 experts from 39 countries in over 350 national environment agencies and other bodies dealing with environmental information.¹²⁰ It has been established in 1994, i.e. long before the MSFD was enacted. EIONet aims to provide timely and quality-assured data, information and expertise for assessing the state of the environment in Europe and the pressures acting upon it (see <http://www.eionet.europa.eu/>).

Under <http://icm.eionet.europa.eu/schemas/dir200856ec/resources>, reporting resources for MSFD are provided. This site offers various guidance documents, reporting sheets, xml schemas and tools.¹²¹

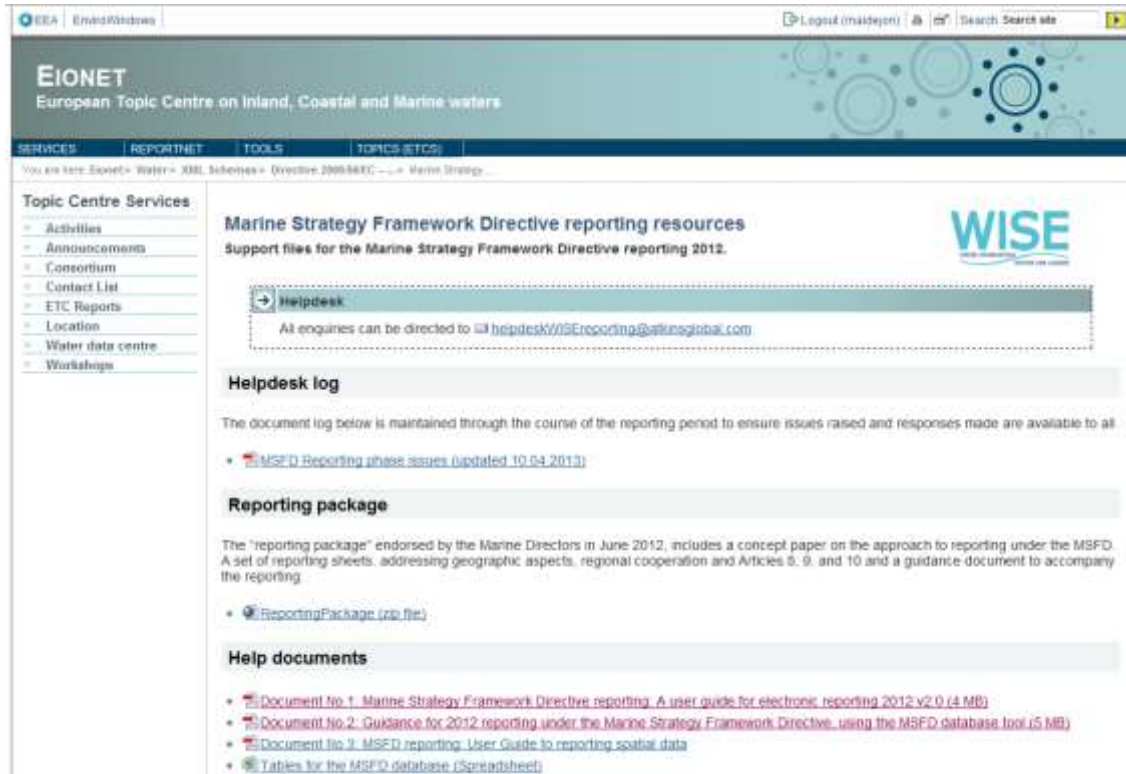
¹¹⁸ see *Marine Strategy Framework Directive (MSFD): Common Implementation Strategy. Approach to reporting for the Marine Strategy Framework Directive*, June 2012

¹¹⁹ ReportNet is “Eionet’s infrastructure for supporting and improving data and information flows” (<http://www.eionet.europa.eu/reportnet>).

¹²⁰ see EEA: EIONET connects. http://www.eea.europa.eu/publications/eionet-connects/at_download/file

¹²¹ see e.g. *Marine Strategy Framework Directive reporting: A user guide for electronic reporting 2012. Version 2.0*, July 2012. <http://icm.eionet.europa.eu/schemas/dir200856ec/resources/Marine%20reporting%20workflow%20user%20manual%20v2.0.pdf>

Figure 21. Eionet’s MSFD reporting resources website



Source: <http://icm.eionet.europa.eu/schemas/dir200856ec/resources>

For the reporting under MSFD, two main different cases have to be distinguished:

- the initial reporting on the present situation (basically due in 2012); and
- reporting on monitoring, due from 2014/2015 onwards.

Also other information has to be communicated to the Commission, e.g. in order to notify it on the national monitoring programmes as one of the coming steps, but these obligations do not imply a communication of larger quantities of technical data or indicators, as discussed in this study.¹²²

For the initial assessment, MS are generally expected to prepare and deliver to the Commission text-based ('paper') reports, but Marine Directors have agreed to additional electronic reporting, according to a set of reporting sheets. Both 'paper' and reporting sheet information are to be submitted via the ReportNet system for inclusion in WISE-Marine.¹²³

¹²² for a full list of reporting obligations, see European Commission. 2012. Approach to reporting for the Marine Strategy Framework Directive. DG Environment, Brussels. Table 1

¹²³ Guidance for 2012 reporting under the Marine Strategy Framework Directive, using the MSFD database tool. Version 1.0

More precisely, for this initial assessment (and other reporting under MSFD Art 4/5, 8, 9 and 10 (2012) and Art 7 (2011)):

- an Excel workbook with reporting spreadsheets;
- an Access database closely corresponding to the Excel spreadsheets;
- a database to XML conversion tool;
- a XML validation tool;
- XML schemas and Schema HTML files; and
- several guidance documents and a helpdesk

have been provided.¹²⁴ The reporting sheets define the specifications for the content of the reports; once agreed with Member States, they are subsequently converted into a schema and database which enables the information to be captured in standardised formats (e.g. use of specified data formats and term lists) for upload into the ReportNet system.¹²⁵

The reporting of monitoring programmes (MSFD, Art 11) will follow a slightly different reporting procedure where relevant information are to be reported directly in web forms as part of the ReportNet procedure and hence there is no database developed to support this reporting.¹²⁶ Details seem to be still under discussion.¹²⁷

Data Storage and dissemination

EIONET as data and information repository mainly

Besides its functions for reporting and uploading of reports, EIONet also provides functionality for dissemination of these reports and data. In the Central Data Repository (CDR) of Eionet, accessible via:

- Member State Name;
- European Union (EU), obligations; and
- Marine Strategy Framework Directive: Articles 8, 9 and 10 & geographic areas and regional cooperation reporting.

Both text-based reports (e.g. national initial assessments for the different marine areas) and data can be found and downloaded. Text-based reports are usually offered in PDF and html format, reporting data in xml (according to the schemes defined for this purpose) or alternatively in html.

¹²⁴ see <http://icm.eionet.europa.eu/schemas/dir200856ec/resources>

¹²⁵ see Marine Strategy Framework Directive (MSFD) Common Implementation Strategy - Approach to reporting for the Marine Strategy Framework Directive. June 2012. The paper: European Commission. 2012. Guidance for 2012 reporting under the Marine Strategy Framework Directive. DG Environment, Brussels. pp74 discusses details such as metadata, which cannot be presented here.

¹²⁶ Marine Strategy Framework Directive reporting: A user guide for electronic reporting. DRAFT Version 3.0, October 2013

¹²⁷ see Working paper 5a: Proposal for the use of web-based monitoring “fact sheets” for the purpose of MSFD reporting. <http://projects.eionet.europa.eu/msfd-wg-dike-technical-group/library/first-wg-dike-meeting/meeting-documents/dike-tsg1-wp5a-monitoringfactsheets/download/1/DIKE%20TSG1%20WP5a%20MonitoringFactSheets.doc>

Table 109. NL-Example: Extraction of fish and shellfish – level of pressure, as reported by the Netherlands

MarineUnit ID	Level of pressure	Number of vessels	Total tonnage (GT)	Total Power	Total number of fishing days
ANS-NL-MS-1	Level of pressure from fishing (vessels <12m – passive & mobile gears)	335	887	22359	5831
	Level of pressure from fishing (vessels >12m – passive gears)	40	1146	5949	1211
	Level of pressure from fishing (vessels >12m – mobile gears – affecting seabed (i.e. trawls, dredges))	352	59076	179493	38457
	Level of pressure from fishing (vessels >12m – mobile gears – other types)	18	72399	77975	1183
	Level of pressure from fishing (recreational)	Unknown_NotAssessed	Unknown_NotAssessed	Unknown_NotAssessed	Unknown_NotAssessed
	Level of pressure from fishing (other)				
	Level of pressure from shellfish collection	100	16125	53308	Unknown_NotAssessed

Source:

http://cdr.eionet.europa.eu/Converters/run_conversion?file=nl/eu/msfd8910/ansnl/envuvtx1g/ANSNL_MSFD8bPressures_20121011.xml&conv=382&source=remote

Details on the storage and dissemination of results from the monitoring programs are not yet known.

Outlook and conclusions for coming years

MS have established and implement MSFD monitoring programmes for ongoing assessment and regular updating of targets by 15 July 2014 (Art. 5 MSFD). Until 15th January 2015 they have to make the data and information resulting from the monitoring programmes available to the EEA.¹²⁸ We do not know yet how these monitoring programmes will be designed by the individual MS, but we can assume that they will require substantial inputs of data collected under DCF or from assessments based on such data. As a consequence, a regular “flow” of data and information between DCF and MSFD will become necessary – much more intensive than it has been necessary for the description of the initial situation in 2012.

As discussed above in the context of relations between MSFD indicators and DCF, the first are in many cases not based directly on DCF data, but on assessments undertaken on their basis. Therefore, the “flow” of data would not be a simple transmission of data from one database to another, and for most cases it appears impossible to derive MSFD indicators and descriptors in an

¹²⁸ see Marine Strategy Framework Directive (MSFD): Common Implementation Strategy. Approach to reporting for the Marine Strategy Framework Directive. June 2012

automatic way – e.g. through a fixed algorithm – from DCF data. Complex scientific processing of data and assessments as well as verification of the validity of baseline data are required, which may differ from indicator to indicator, species to species and region to region. This may gradually change in the long run, when MSFD procedures become more established, but even then automatic processing and transmission, without human intervention, cannot be expected to become the standard case. Consequently, there is no need to establish fixed interfaces between DCF and MSFD databases, but only to ensure full accessibility of DCF data and assessments based on them for those who are in charge of compiling MSFD indicators.

As pointed out above, the specific challenge is that not only data have to be transmitted between two instruments, but that institutions under environment and fisheries policy have to cooperate in assessments and contribute their knowledge to the overall process.

It is a logical and desired consequence of the ecosystem approach to fisheries management on the one hand and the overarching ecosystem approach of the MSFD on the other hand, that both policy branches have to cooperate closely and communicate data and information. And where MSFD today only requires a communication of data and information in one direction, from DCF to MSFD, in future, even a two-way exchange may be useful.

The discussion also shows that many data and information required under MSFD relate to transboundary waters or stocks. This suggests not only to store DCF data and undertake stock assessments and other analyses on their basis on a supra-national level (as done today by e.g. by ICES or RFMOs), but also to undertake all necessary assessments for MSFD (e.g. for descriptor 3) on this level and either make the results directly available for national reports or report directly to a supra-national database, thus preventing unnecessary duplication of work on MS level.

The development of suitable data storage, transmission and dissemination infrastructure and instruments for MSFD seems to be ongoing (see e.g. documents of WG DIKE) and cannot be discussed here in detail. There are discussions to use EMODnet – which falls under IMP and therefore under DG MARE – for some purposes under MSFD (see below). This could contribute to a general strengthen data links between fisheries, maritime and environmental affairs.

1.9.2. Interactions with other EU Programmes: IMP and EMODnet

The Integrated Maritime Policy (IMP)

In 2006, the Green Paper on the future of the European Maritime Policy¹²⁹ launched a consultation that gave rise to the EU Integrated Maritime Policy (IMP), which was established in 2007¹³⁰ under

¹²⁹Green Paper: *Towards a future Maritime Policy for the Union: A European vision for the oceans and seas*, Brussels, 7.6.2006. COM(2006) 275 final

¹³⁰Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: *An Integrated Maritime Policy for the European Union ('Blue Paper')*, Brussels, 10.10.2007. COM(2007) 575 final

the umbrella of DG MARE. The IMP builds on a cross-sectoral and multidisciplinary approach, taking account of the economic, social and environmental dimensions of sustainable maritime development.

In view of the challenges related to globalisation and competitiveness, climate change, degradation of the marine environment and coastal areas, maritime safety and security and energy security and sustainability, the IMP has the aspiration to coordinate the various marine and maritime related initiatives under the different sector policies in a coherent way, but, at the same time, without replacing “policies on specific maritime sectors”¹³¹.

The sectors addressed by the IMP range from fishing and aquaculture, shipbuilding, shipping and ports to offshore energy (including oil, gas and renewables), blue biotechnology and coastal maritime tourism and recreation. Accordingly, the policy areas addressed by the IMP do not fall only under the competence of DG MARE, but also under that of other EC Directorates such as:

- **DG Environment** (DG ENVI) for issues related to the marine environment and ICZM (Integrated Coastal Zone Management), as well as for the MSFD (Maritime Strategy Framework Directive), “the environmental pillar of the IMP”¹³² (as discussed in the previous chapter);
- **DG Research & Innovation** for topics related to marine and maritime research;
- **DG Mobility and Transport** for maritime transport/shipping, ports, maritime safety and security and partly also research;
- **DG Energy** for matters related to offshore energy, including renewable wind and ocean energy;
- **DG Regional and Urban Policy** for regional development and funding for different activities related to the maritime sector;
- **DG Enterprise and Industry** for shipbuilding and recreational crafts.

The strategies for the development of the maritime sector followed by the various directorates might indeed have been developed in accordance with the IMP defined by DG MARE. However, it goes beyond the scope of this study to analyse policy strategies or any inherent reporting obligations that are in no direct relation to DCF. Yet, as thoroughly described in the previous chapter, the only direct link that could be established to DCF in the context of the Integrated Maritime Policy is the Marine Strategy Framework Directive (DG ENVI) and the reporting obligations related to this.

Among the cross-cutting policy areas addressed by DG MARE through the IMP, besides blue growth (marine and maritime economy), maritime spatial planning, integrated maritime surveillance and sea basin strategies, a special focus has been placed on *marine data and knowledge*.

¹³¹ http://ec.europa.eu/maritimeaffairs/policy/index_en.htm

¹³² Progress Report on the EU's Integrated Maritime Policy, Brussels, 15.10.2009, COM(2009)540 final {SEC(2009) 1343}

EMODnet

Already in the Green Paper of 2006, the Commission acknowledged that “Better understanding of the competing uses of the ocean will require better data and information on maritime activities, be they social, economic or recreational, as well as on their impacts on the resource base” and considered the creation of a European Marine Observation and Data Network “which would provide a sustainable focus for improving systematic observation (in situ and from space), interoperability and increasing access to data, based on robust, open and generic ICT solutions.”

The ‘Blue Paper’ followed this idea by highlighting the importance of available and easy accessible high quality marine data (both nature and of human activity-related) for the decision making process in a strategic maritime policy. Moreover, it stressed that “Given the vast quantity of data collected and stored all over Europe for a wide variety of purposes, the establishment of an appropriate marine data and information infrastructure is of utmost importance” and announced first steps for the creation of the European Marine Observation and Data Network. This should tackle the problem of a fragmented marine data infrastructure and support the “multi-dimensional mapping of Member States’ waters”.

In fact, the first preparatory actions for the development of a European Marine Observation and Data Network (EMODnet) took place between 2008 and 2010 through the development of prototype data platforms (the so-called ur-EMODnet). In this sense, six thematic assembly groups were defined in order to cover specific marine data on: hydrography, geology, physics, chemistry, biology and physical habitats. The establishment of a thematic group on human activities was also envisaged for a later stage.

Through a process of calls for tender, a series of procurement contracts were concluded with six consortia – formed by a network of 53 organisations in total (mainly public bodies but also a few small private companies – with the objective of setting up internet portals for the six defined thematic assembly groups in order to provide access to marine data, metadata and data products for entire sea basins.¹³³

As part of the Marine Knowledge 2020¹³⁴ agenda, EMODnet seeks to reduce the operational costs and delays for users of marine data (private industry, public bodies and scientific community), increase competition and innovation by ensuring a wider access to quality data and reduce uncertainty in knowledge of the oceans and seas.

One of the main objectives of the network is to achieve a harmonised data management approach by adopting common standards and protocols for quality control procedures, metadata formats and descriptions, and data exchange formats.¹³⁵ Furthermore, one of the key issues of

¹³³ Progress of the EU’s Integrated Maritime Policy, Brussels, 11.9.2012. COM(2012)491 final.

¹³⁴ Green Paper Marine Knowledge 2020 from seabed mapping to ocean forecasting. Brussels, 29.8.2012 COM(2012) 473 final {SWD(2012) 250 final}

¹³⁵ EMODNET – The European Marine Observation and Data Network, Marine Board - EuroGOOS perspective

EMODnet is the need for a data policy that ensures a full and open access to data, where possible without restrictions of use.

In line with this, the six thematic portals are required to comply with the following requisites:

- Data, metadata and data products shall respect European standards and particularly the INSPIRE Directive¹³⁶ which defines common rules concerning metadata, data specifications, network services, data and service sharing, monitoring and reporting with the aim to ensure EU-wide harmonisation and compatibility in spatial data infrastructures. (Beyond these common principles, it is the task of each thematic assembly group to define standards for more specialised data at a detailed level).
- Metadata and data products shall be made available free of charge and without restrictions on use for whatever purpose; this shall apply where possible also to data (despite constraints due to license restrictions by data owners).

EMODnet has worked so far on the basis of 3-year projects. During the first phase, from 2008 to 2010¹³⁷, the thematic groups were requested to have operational portals after 24 months, while the third project year was used for maintenance and improvement tasks. At present, the project is going through its second phase, lasting from 2011 to 2013, which is being funded through Regulation 1255/2011¹³⁸ for the support of IMP activities. The third, post-2013 phase of EMODnet is expected to be supported through the multiannual financial framework of the European Maritime and Fisheries Fund (EMFF, 2014-2020).

Compilation and storage of data under EMODnet

As outlined in the *Roadmap for European Marine Observation and Data Network (EMODnet)*¹³⁹, “data and metadata are best maintained as near to the source as possible”, thus data shall be stored at national level, i.e. at national data centres. According to this, the target is not to create a huge database, but to make data accessible through a single entry point (portal) while keeping the data in separate national archives. At the same time, it is important to keep the 6 defined assembly groups separated, since each type of data requires a different approach.

Moreover, the EMODnet Roadmap lays emphasis on assembling the data at a sea-basin level; this is of key relevance, particularly in view of the elaboration of data products that are based on EU wide harmonised data.

¹³⁶ Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)

¹³⁷ Between 2008 and 2010, 6,450 million Euros were committed to projects for marine knowledge.

¹³⁸ Regulation (EU) No 1255/2011 of the European Parliament and of the Council of 30 November 2011 establishing a Programme to support the further development of an Integrated Maritime Policy

¹³⁹ Ref. Ares(2012)275043 - 08/03/2012

Each EMODnet thematic group is responsible for assembling the relevant marine data and making them available through a single portal for assigned European sea-basins, i.e. each portal covers the North Sea and at least two other basins.

Table 110. Data coverage of EMODnet thematic assembly groups¹⁴⁰

Thematic assembly group	Type of data and metadata	Data products	Coverage	Main contractor
Hydrography (2 contracts)	Bathymetry (water depth), coastlines, underwater features (seabed mapping, wrecks, etc.)	Digital terrain model for most European waters (3-dimensional representation of the topography of the sea floor)	North Sea, Celtic Seas, the Western Mediterranean, the Ionian Sea and the Central Mediterranean;	MARIS B.V., Netherlands (start: 05/2009)
			Eastern Mediterranean, Black Sea, Iberian Atlantic and Biscay	MARIS B.V., Netherlands (start: 06/2010)
Geology	Sediments, strata, coastal erosion, geological hazards	Sediment maps (data layers) for selected European sea-basins	North Sea, Baltic and Celtic Seas	NERC BGS, UK (start: 7/2009)
Physics	Temperature, waves, currents, salinity, sea-level, light penetration, wind, atmospheric parameters. Hindcasts, nowcasts and forecasts for various parameters	n/a	All European seas	ETT, Italy (start: 12/2010)
Chemistry	Concentrations of chemicals in water, sediments and biota	Diva interpolated maps, time series plots	North Sea, Black Sea and selected parts of Mediterranean	OGS, Italy (start: 06/2009)
Biology	Abundance of living species	n/a	North Sea, Bay of Biscay and the Iberian Coast	VLIZ, Belgium (start: 05/2009)
Physical habitats	Habitat classification based on physical parameters (water depth, light penetration, sediments, etc.)	Physical habitat maps covering a significant proportion of European seas	North Sea, Celtic Seas, Baltic and Western Mediterranean	JNCC, UK (start: 02/2009)

¹⁴⁰ Based on Commission Staff Working Document Interim Evaluation of the European Marine Observation and Data Network Accompanying the document Green Paper Marine Knowledge 2020: from seabed mapping to ocean forecasting, Brussels, 29.8.2012 SWD(2012) 250 final {COM(2012) 473 final}

According to the EMODnet interim evaluation, three of the thematic groups apply SeaDataNet¹⁴¹ standards for describing their metadata. Further details on the software used by each group can be found in the table below.

Table 111. Technologies, software and standards used by the thematic assembly groups

Thematic assembly group	Technologies, software and standards
Hydrography	CDI data discovery & access, DTM viewing service, products catalogue, 3D Viewer, NetCDF (CF) survey data sets download format; OGC (OpenGIS®) WMS compliant and available as WMS (web map) service; metadata follows ISO19115 and uses SeaDataNet common vocabularies.
Geology	Software, methods and standards developed under the OneGeology Europe project (which includes land data and ensures continuity between sea, coast and land); Geological Metadata Profile (GMP), for collecting metadata records; Metadata Catalogue integrated in OneGeology-Europe portal; GeoSciML (Geoscience Mark-up Language): INSPIRE standard for the exchange of geoscience interpretive (map) data over the internet; provides WMS viewing and WFS download services.
Physics	Use of components of the Global Monitoring for Environment and Security (GMES) MyOcean project for real-time observations; SeaDataNet for archived observations; Common Data Index (CDI) for descriptions of distributed data sets and their access procedures; SeaDataNet data formats: ODV (ASCII) and NetCDF (CF) Common Vocabularies; achieved data quality control procedures.
Chemistry	SeaDataNet standards: CDI (metadata), BODC Standard Vocabs (common terms), ODV data format (background data exchange), NetCDF files and ODV plots loaded as WMS layers (data products); Software: MIKADO (metadata mapping and xml generator), NEMO (data formatting tool), DIVA software (gridded data products and error maps as NetCDF files), ODV software (“time series” products generation and QC check); EMODnet Data Products Catalogue + OGC viewer + downloading.
Biology	European Ocean Biogeographic Information System "EurOBIS" - network of distributed data systems; data portal system integrating metadata, data and data products through one integrated portal interface; OGC compliant data system; metadata in IMIS/Integrated Marine Information System (can generate GCMD and EDMED compliant formats); Biological datasets: OBIS scheme (73 fields, extension of Darwin Core 2 Taxonomic standard: WoRMS, Geographic standard (MarBOUND / VLIMAR~MarineRegions); Data products: follow OGC standards (metadata: CSW, maps: WMS, features: WFS).
Physical habitats	Deliver products (= seabed maps), based on modelling several types of measurements. Harmonisation between the North Sea and Celtic Sea and the Baltic Sea areas classification (based on results from Interreg MESH (North Sea and Celtic Sea) and BALANCE (Baltic) projects) and extension to the Western Mediterranean by using the European EUNIS classification standard for maps.

¹⁴¹ SeaDataNet, developed through various projects under the Fifth (SEASEARCH), Sixth and Seventh Framework Programmes, is an infrastructure for the management of marine data sets based on in-situ and remote observations. It is formed by a pan-European network of national oceanographic data centres. SeaDataNet has set up a standardised system for the management of large and diverse data sets. <http://www.seadatanet.org/>

Moreover, the hydrography portal includes a tool that makes it possible to evaluate the accuracy (also through the generation of maps) and precision of the data. Besides, it gives information on the number of surveys that have contributed to the digital terrain model (in a certain point) and on standard deviation.

To exchange on the progresses and issues of the various EMODnet portals, common six-monthly “mutual awareness meetings” take place between the representatives of all thematic assembly groups. Besides, EMODnet has set up a mechanism of peer examination through the Marine Observation and Data Expert Group formed by 28 independent members who attend the EMODnet meetings and express their opinion on the developments of the various portals.

Accessibility of data under EMODnet

As mentioned above, the six thematic portals provide access to:

1. **Data:** raw observations or measurements;
2. **Metadata:** information about the data (e.g. location, time of measurement, unit, precision, etc.);
3. **Data products:** products derived from the data, e.g. estimates of parameter values between measurement points (normally obtained by interpolation in space and time); for example digital terrain models on regular grids or geological maps or predicted habitat maps (developed through integration of other data sets).

Availability of data is provided through the various single thematic portals: these work as internet gateways and give access to the archives managed at national level (i. e. by member states' institutes), or at regional level by international organisations (i. e. consortia of marine data organisations, e.g. pan-European oceanographic organisations, etc.). In this way, access is provided not only to data, but also to metadata and also data products where available.

One of the immediate actions planned for EMODnet is to develop a main central portal as common gateway to provide access to all six portals (seven, including the planned thematic group on human activities) and to deliver additional data services and case studies. For the time being, a general EMODnet landing page has been activated, which gives some introductory information and links to the thematic portals.

Outlook for coming years

According to Interim Evaluation of EMODnet, one of the lessons learned is that keeping the data and metadata at national level (in national archives) and having the possibility to retrieve/recall the data automatically on demand is more efficient than asking the MS to report to a central body.

In line with this, the intention to integrate data collected under the Data Collection Framework into EMODnet has been declared in many occasions, most recently through the EMODnet Roadmap as well as the interim evaluation¹⁴². In fact, the DCF Regulation¹⁴³ (Article 16, 1. and 2.) stipulates that “(...) Member States shall ensure that the Commission has access to the national computerised databases (...)”. However, to the knowledge of the authors, neither data stored at national level is directly accessible to Commission services yet, nor does EMODnet provide access to any DCF-related data to date.

In view of this discussion, the following table presents a proposal on the type of data collected under DCF that could be integrated into the various EMODnet thematic portals.

Table 112. Proposal for the integration of data collected under DCF into EMODnet

Thematic assembly group	Type of data collected	Data collected under DCF
Hydrography	Bathymetry (water depth), coastlines, underwater features (seabed mapping, wrecks, etc.)	<u>Environmental indicators:</u> - Areas not impacted by mobile bottom gears
Geology	Sediments, strata, coastal erosion, geological hazards	n/a ¹⁴⁴
Physics	Temperature, waves, currents, salinity, sea-level, light penetration, wind, atmospheric parameters. Hindcasts, nowcasts and forecasts for various parameters	n/a
Chemistry	Concentrations of chemicals in water, sediments and biota	n/a
Biology	Abundance of living species	<u>Biological data</u> - (Métier-related variables) - Stock-related variables <u>Environmental indicators:</u> - Conservation status of fish species - Proportion of large fish - Mean maximum length of fishes - Size at maturation of exploited fish species
Physical habitats	Habitat classification based on physical parameters (water depth, light penetration, sediments, etc.)	n/a

¹⁴² A similar view has been expressed with regard to the reporting obligations under MSFD and their integration into EMODnet.

¹⁴³ Council Regulation (EC) No 199/2008 of 25 February 2008 concerning the establishment of a Community framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the Common Fisheries Policy.

¹⁴⁴ Whereas there are some discussions on the possibility to merge the thematic groups for hydrography and geology due to overlappings in their survey methodologies and instruments.

Thematic assembly group	Type of data collected	Data collected under DCF
Human activities (?)	Gravel extraction, aquaculture , shipping, etc.	<u>Biological data</u> - Métier-related variables <u>Economic variables</u> - Fleet segment - Aquaculture sector - Processing industry sector <u>Transversal variables</u> - Capacity - Effort - Landings <u>Environmental indicators:</u> - Distribution of fishing activities - Aggregation of fishing activities - Discarding rates of commercially exploited species - Fuel efficiency of fish capture

Concerning the latter, the thematic assembly group on human activities originally planned in the Marine Knowledge 2020 strategy, it is not clear how far the preparations are for setting up the portal. However, being fisheries an intrinsic human activity with a direct effect on the marine environment, it would make sense to include here those DCF variables that are not of purely biological or environmental nature, i. e. those data related to the fleet features and its activity as well as the aquaculture and processing sectors. In turn, for métier-related biological variables, it should be carefully evaluated if this type of data is better integrated either into the biology portal or rather the human activities group, where it can be linked to other fleet segment characteristics.

In general terms, the discussion of integrating or linking national data collected under DCF together with the possibility of creating data products (e. g. maps describing the distribution and aggregation of fishing activities), through the EMODnet portals has been surrounded by concerns related to the loss of level of detail of data. This is mainly due to obligations related to confidentiality of data on fishing enterprises; a certain level of aggregation has to be assured. Besides, another important question to be solved would be what body (e. g. JRC, ICES) shall take the lead in overarching activities for DCF within EMODnet.

Focusing on the EMODnet initiative in general, a key issue for the future is the continuity of the project, which has so far been based on three-year projects sustained and driven forward by the Commission. However, looking ahead, there is the necessity for developing a formula for the EMODnet that allows a sustainable and cost-effective infrastructure and is driven at the same time by the needs and priorities of the sector, including industry, public authorities and research community.

1.10. Conclusions / Current Situation / Baseline Scenarios

Sections 1.1 to 1.9 present a detailed description of the way in which the DCF and other fisheries-related data is transmitted to supra-national databases, stored and disseminated. This section presents the main conclusions. This Interim Report is based on an extensive survey of all relevant Member States as well as all major stakeholders for fisheries (related) data, i.e. ICES, JRC, DG Mare, Eurostat, GFCM, relevant Regional Fisheries Management Organizations (RFMOs) and Regional Sea Conventions (RSCs).

Legal basis

Collection of fisheries data by the MS is based on two regulations:

- Control regulation (CR), generates information in almost real-time on fishing effort, volume and value of landings through logbooks, sales notes and VMS. This is census (i.e. exhaustive) data, with the exception of vessels below 12m. CR data forms the basis for preparation of sampling surveys under DCF.
- Data collection framework (DCF), with the primary purpose to generate the scientific data required for stock assessment and evaluation of the economic performance of EU fishing fleets, aquaculture and fish processing.

In addition, other EU legal acts regulate the production of aquaculture and fish processing statistics.

Considering that DCF and CR are based on two **different legal instruments** and pursue different objectives, a far reaching integration of these two data collection systems does not seem feasible.

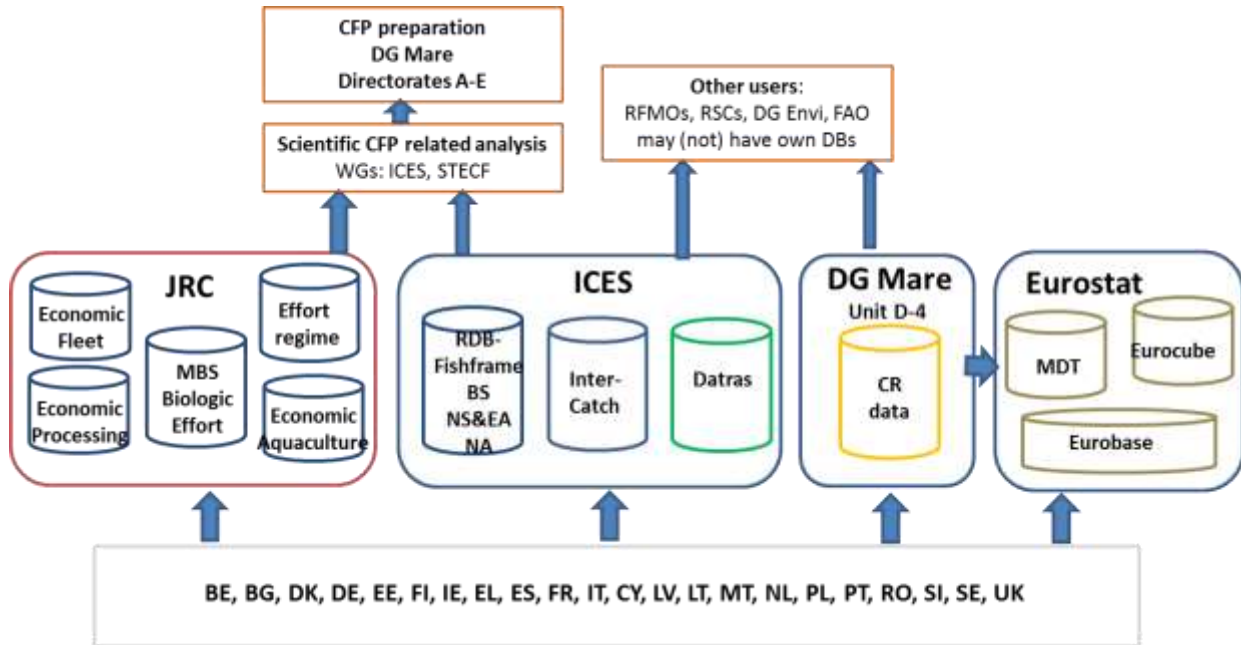
On national level, intensive cooperation between the responsible institutions has been achieved.

Access to Control data

In order to collect DCF data, the responsible national institutions must have sufficient **access to the CR data**. The survey of the national correspondents shows that this is indeed the case in large majority of the MS.

The main present data flows are broadly presented in figure 22.

Figure 22. Main present data flows



Data transmission

MS transmit different data to different databases, although some **overlaps** exist:

- Biologic indicators on Atlantic stocks are transmitted to RDB-Fishframe and to InterCatch DB. Both DBs are operated by ICES. It is possible to transfer the data manually, but this not yet practiced. ICES is preparing an automated procedure to link RDB-Fishframe to InterCatch.
- Total MS landings (by species and FAO areas) are based almost always on CR data. They are transmitted to Eurostat, JRC (fleet economic data) and ICES (RDB-Fishframe).
- Data on aquaculture and fish processing are collected under two regimes and submitted to JRC and Eurostat. The requirements of the two regimes are somewhat different. The detailed comparison of JRC's *dc-aqua* and Eurostat MDT for aquaculture is needed, as is the re-assessment of the value of maintaining the two approaches should be scrutinized.
- Effort data submitted to DG Mare under the CR overlaps significantly with the DCF submission under the JRC's effort regime data call and the effort part of the MBS data call.

Streamlining of data provision can be achieved as follows:

- National catch and effort data should be generated by the MS at a low aggregation level and uploaded to a common DB in order to allow flexibility of aggregations for different purposes (i.e. data calls by JRC and ICES).
- Collection of data on fish processing relies in many MS on Structural Business Survey (SBS). Unless the additional data compiled under DCF is considered essential and of sufficient quality, it should be considered to concentrate the data collection effort in this area under SBS.
- Collection of data on aquaculture is a relatively small activity. Integration of Eurostat and DCF activities should be promoted and the duplication of data calls from Eurostat and JRC re-examined. This integration has to take place on national level, but it is driven by the obligations of the various regulations.
- Eurostat compiles catch information on behalf of NAFO. It seems preferable to provide this information either from DG Mare or through ICES.

No overlaps have been identified in relation to transmission and storage of fleet economic indicators and the data regarding MBS. In relation biological and métier-related indicators on Atlantic areas once the relation between RDB-Fishframe and InterCatch will be operationalized, there will be a unique data flow. It is important to stress that although formally three ‘regional DB’s’ are distinguished within Fishframe, in reality Fishframe is one DB, with regionally classified data.

Data **transmission** from the MS to the various DBs takes place under various data calls. The calls have been highly standardized. Specific formats, guidelines and validation tools are available. In 2013 the separate data calls for the RDB-Fishframe regional DBs have been integrated into one single call.

Quality control

The report presents a detailed overview of **quality control** procedures at national and supra-national level. It shows that a far reaching quality control system exists, but further standardization could be achieved. A large number of quality controls are run with software tools which should be compared (i.e. compatible edit rules should be used) and shared among MS and supra-national institutions

Dissemination and use of DCF data

Dissemination takes place at two distinct levels. Relatively more detailed data is available to ‘professional users’, i.e. working groups of ICES and STECF. Both ICES and JRC have developed dissemination DBs, although the biological indicators compiled in RDB-Fishframe are not (yet) publicly accessible.

It is important to notice that all institutions involved are legally capable of guaranteeing data **confidentiality**. In principle this means that primary or detailed data could be compiled in supra-national DBs. This could be particularly beneficial for fleet economic data. Large part of the biological indicators is already stored at the level of individual measurements.

Number of **'special users'** exists – GFCM, other RFMOs, RSCs:

- GFCM is developing a database to cover its needs. Setting-up a specific regional DB for MBS is being considered. Such DB would have to replace the present JRC call for MBS data. It should be questioned to which extent replacing one procedure with another will lead to greater efficiency or other benefits.
- Other RFMOs have specific data requirements depending on the stocks with which they are dealing. A specific RDB dealing with large pelagics is under development at IRD (France). This RDB could service RFMOs dealing with tuna. Provision of information to other RFMOs, where EU fleets are active, is still not yet assured.
- The RSCs focus on environmental quality in general. Their interest in fisheries data is relatively limited in the context of biodiversity. OSPAR and HELCOM have special arrangements with ICES to obtain the necessary information.
- DCF data can be expected to contribute to the implementation of MSFD. By the end of 2013, the MSFD needs in relation to DCF data have not yet been well enough defined to allow a detailed evaluation.

Other EU initiatives can benefit of DCF data:

- There are clear interactions between DCF data and those required for other EU initiatives such as the IMP, the MSFD and the EMODnet. DCF is a source for indicators required by IMP and MSFD, and it could be also integrated into the EMODnet portal. As there is still a need for further defining MSFD indicators, and these require expert intervention for their calculation, it seems not possible yet to design a direct interface between DCF databases and MSFD ones (in particular EIONet).
- Regarding EMODnet, its link to DCF can be addressed at the dissemination stage, with sea-basin level information (especially on the biology and human activity sectors). All existing DCF-related databases accessible for the public and containing geo-localised data could be in principle made also accessible through EMODnet, for which geographic (mapping) features are an important advantage.

Alternative scenarios

In order to improve efficiency of the DCF system further, the study elaborates three scenarios on the future set-up of the supra-national data transmission; storage and dissemination (see next Section):

- Supra-regional DB (Eurostat model), where all data would be concentrated in one DB;

The logo for cofad, featuring the word "cofad" in a bold, blue, sans-serif font.The logo for devstat, featuring a stylized red 'd' with two black dots above it, and the word "devstat" in a red, lowercase, sans-serif font below.The logo for FRAMIAN, featuring a square with a diagonal line from the top-left to the bottom-right, and the word "FRAMIAN" in a blue, uppercase, sans-serif font below.The logo for GOPA, featuring the word "GOPA" in a bold, green, uppercase, sans-serif font, with "WORLDWIDE CONSULTANTS" in a smaller, green, uppercase, sans-serif font below.

- Regional nodes (Fishframe model), organizing compilation of DCF data along regional lines; and
- Network-based model (EMODnet model), in which national DBs would be made accessible through a web-based portal.

One of the objectives of the future set-up is to integrate economic and biological data. These two sets of data are linked through data on landings and effort, which are contained in both. The data definitions and the way in which the data is compiled on national level were compared in detail. The **present aggregation levels of the two sets of data seem incompatible** at this stage of the study and will be addressed during the 2nd phase.