PLASMAR

Bases para la planificación sostenible de áreas marinas en la Macaronesia

DELIVERABLE 2.1.1B3 - TECHNICAL REPORT ON IMPLEMENTATION OF THE ENVIRONMENTAL LEGISLATION IN THE MACARONESIAN REGION – REPORT CANARY ISLANDS

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I. Introduction

Marine Strategy Framework Directive

This study lists the requirements of the EU environmental directives that apply on marine and coastal areas and presents the current state of play of the implementation, including the actions that have been applied for the Canary Islands. It is necessary to understand what is already done due the implementation of the environmental policies, so it can be considered and potentially reused in the Maritime Spatial Planning process.

Study is focused on the implementation of the Marine Strategy Framework Directive 2008/56/EC (MSFD), European legal instrument on Integrated Marine Management, as the Directive requirements overlap with the European environmental legislation that partially applies to the sea.

Regarding the accessibility, REPORTNET portal (reporting document repository and an integrating part of the European Environment Information and Observation Network) was chosen as a main tool and information source point. REPORTNET hosts data and information reported during the first cycle (2010 – 2018) of the MSFD implementation process.

To examine MSFD implementation state of the play REPORTNET was accessed during September - November 2017.

Figure 1 – Canary Islands

1.1 MSFD 6 year reporting

European Union's obligations in relation to the implementation of the common environmental legislation for Spain including Canary Islands are listed at the European Environment Information and Observation Network (EIONET) portal:
http://cdr.eionet.europa.eu/es/eu/

The list includes four MSFD obligations, with link to the document repository REPORTNET, that contains reports, data and information provided in implementation process:

- Marine Strategy Framework Directive (MSFD) Competent Authorities (2010)
- Marine Strategy Framework Directive: Articles 8, 9 and 10 & geographic areas and regional cooperation reporting (2012)
- Marine Strategy Framework Directive: monitoring programmes (2014)
- Marine Strategy Framework Directive: programmes of measures (2016)

These web folders/documents are analyzed in details to understand the current status of MSFD implementation for the Canary Islands and what should be considered and potentially reused in the Maritime Spatial Planning process.

Each web reporting folder includes following structure:

1. **Technical report provided as a structured XML file(s)**

XML files were analyzed, using the XML viewers, converters and analyzers. This structured type of reports, mostly in English language, facilitate comparison with reports of other EU member states, including reports delivered for Madeira and Azores.

2. **National text based report(s)**

Core MSFD reporting is delivered providing XML structured files which are sometimes difficult to read, requiring technical ability and specialized software. To facilitate access to such reports to the wider public, Spain provided text based reports, separately per each sub-region, as a set of documents where they are explained in depth on how the information is gathered, analyses applied and finally the results.

3. **Geographical data and information folder**

These folders include required spatial data information provided in the reporting process.

II. Competent authority

2 MSFD report on Marine Region or Subregion competent authority or authorities

Spain provided the Commission with a report of the competent authority designated for Spanish marine regions and subregions concerned, which are relevant for the implementation of MSFD. This reporting started by 15 January 2011 and final version is uploaded by January 2013. Competent authority in Spain is the **Ministry of Agriculture, Food and Environment (Ministerio de Agricultura y Pesca, Alimentación y Medio Ambiente - MAPAMA)**.

The report is available at the following link:
http://cdr.eionet.europa.eu/Converters/run_conversion?file=es/eu/msfd_ca/envugpvvq/ES_MSCA_20130109.xml&conv=268&source=remote

III. Initial Assessments, Good Environmental Status, Environmental targets & associated indicators, geographic areas, regional cooperation and metadata

3 MSFD reporting on Initial Assessments, Good Environmental Status, Environmental targets & associated indicators & related reports on geographic areas, regional cooperation and metadata

This report was scheduled for 2012, and for this period it was required to make an initial assessment, determine a set of characteristics for good environmental status and establish a comprehensive set of environmental targets. Therefore it was necessary to assess trends in relation of the Good Environmental Status (GES) taking into account the indicative lists of pressures & impacts and characteristics of marine environment. Additionally, it was mandatory for each marine strategy to define area of the competence where MSFD will be implemented.

Reporting repository folder includes:

1. Geographical data and regional cooperation_MSFD4Geo
2. National text-based paper report related to articles 8, 9 & 10
3. XML reports are provided in separate folders for Western Mediterranean Sea, Bay of Biscay & the Iberian Coast and Macaronesia
4. Metadata folder in relation of MSFD Article 8 & Article 19

3.1 Geographical data and regional cooperation_MSFD4Geo

Spain will implement the MSFD in the Exclusive Economic Zone established in the Atlantic Ocean and Cantabric Sea. In the Mediterranean Sea implementation of MSFD will be applied in the Spanish Fishery Protection Zone, proclaimed in 1997. Formal subdivision of Spanish ocean and seas is on the three sub-regions and related divisions "demarcaciones":

1. **SUBREGION GOLFO DE VIZCAYA Y COSTAS IBERICAS;**
    a. Demarcación noratlantica
    b. Demarcación sudatlantica
2. **SUBREGION MEDITERRANEO OCCIDENTAL;**
    a. Demarcación Estrecho y Alboran
    b. Demarcación levantino-balear
3. **SUBREGION MACARONESIA.**

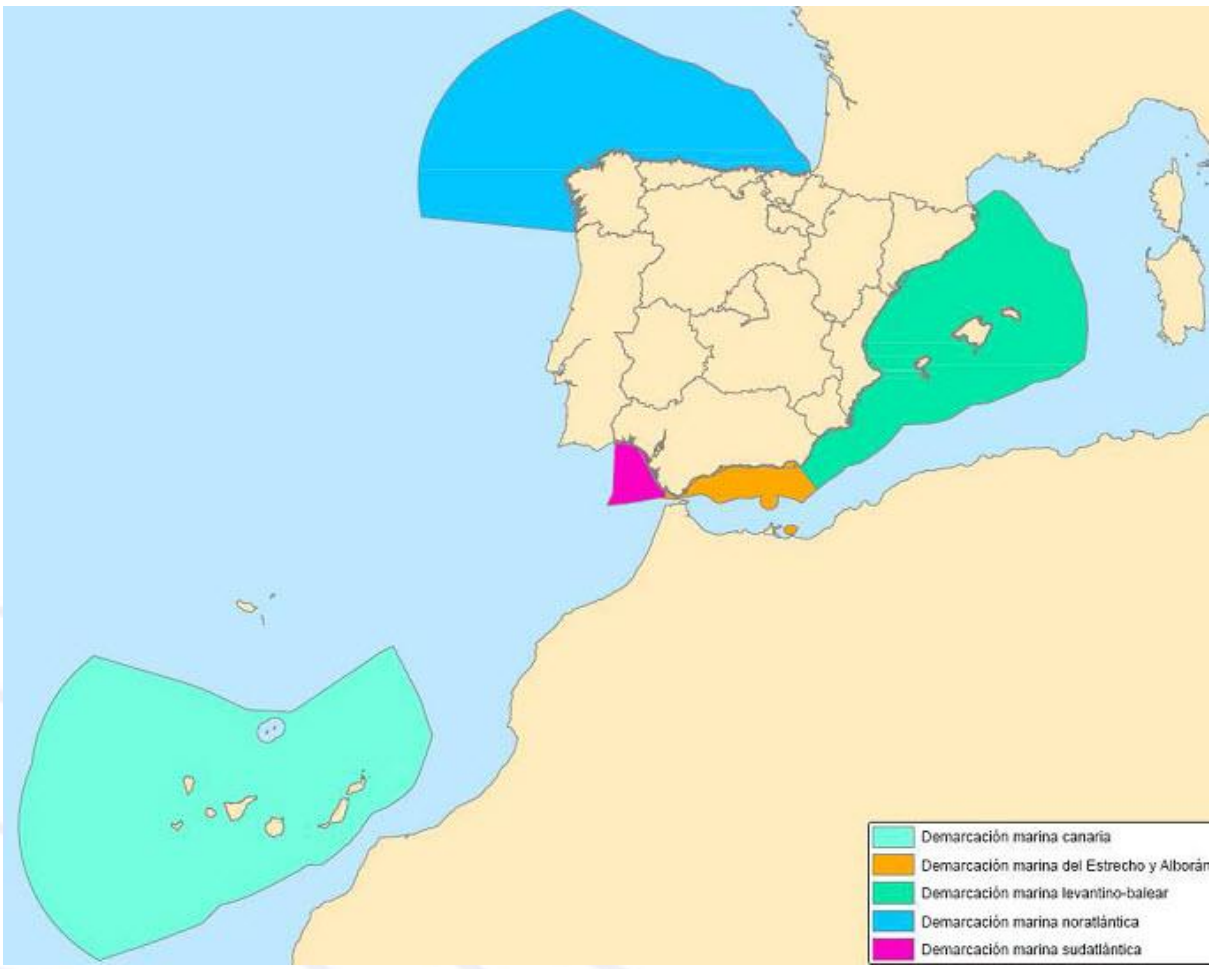

Figure 2 - Spanish marine sub-regions and related "Demarcaciones", source MAPAMA

Reports on the regional cooperation are available for the North East Atlantic and Mediterranean Sea. North East Atlantic report includes Oslo Paris Regional Sea Convention (OSPAR) publication on joint implementation of the MSFD. As Canary

Islands are not part of the OSPAR or other regional sea conventions, the Spanish sub-region of Macaronesia is not included in this part of the report.

The first envelope with spatial data was provided in 2012. Since 2013 a new folder is opened for second envelope, with remark that work is still in progress. Envelope includes spatial data (shp. file), provided in 2012 and is available at:
http://cdr.eionet.europa.eu/es/eu/msfd8910/msfd4geo/envuhbqka/
The spatial data provided does not include territorial waters, only formal division on sub-regions.
Reported geographic area of (Spanish) sub-region Macaronesia is overlapped with reported geographical area for Madeira archipelago. Due to the overlap of reported EEZ of Canarias with reported EEZ Madeira, to avoid any possible issues, PLASMAR project will use union of both reported areas (Figure 3).

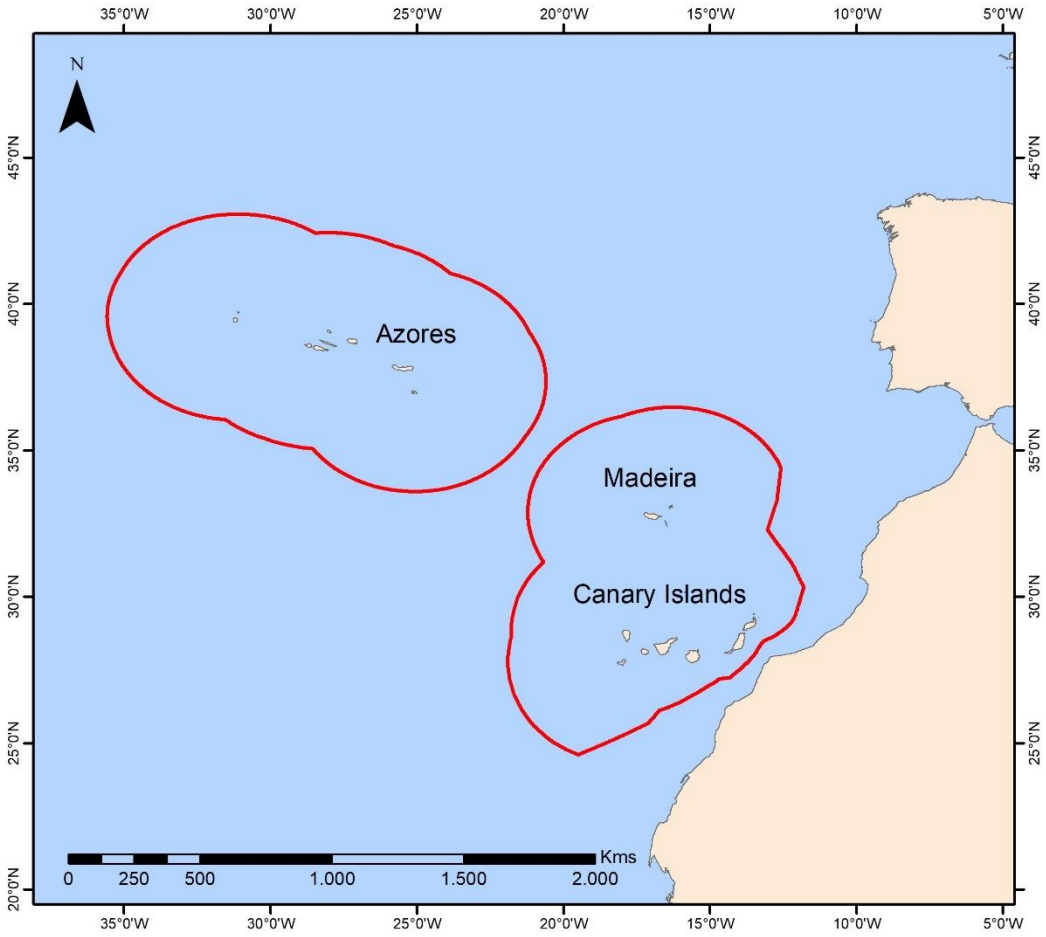

Figure 3 - Union polygon of reported EEZ Canarias with reported EEZ Madeira

3.2 National text-based paper report: Art 8, 9 & 10

The folder with reports that refer to Canarias sub-region includes 14 documents, including, *General framework*, *Pressure & Impact Analysis*, *Economic Social Analysis* and assessment per quality descriptor, is available at:
http://cdr.eionet.europa.eu/es/eu/msfd8910/msfd4text/envuhupia/
The next folder includes documents with environmental targets, separately for each sub-region including Canarias, and is available at:
http://cdr.eionet.europa.eu/es/eu/msfd8910/msfd4text/envuhvu4g/
All these documents are analyzed to assess the first phase of the MSFD implementation for the Canary Islands.

3.2.1 General framework (Marco general: características de la demarcación marina I)

The document is available at:
http://cdr.eionet.europa.eu/es/eu/msfd8910/msfd4text/envuhupia/I_Marco_General_Canarias.pdf/manage_document

This report includes details on the physic chemical characteristics of the Canary Islands, including topography & bathymetry; meteorology; hydrography; nutrient distribution & oxygen; carbon dioxide & acidification; and chapter on hazardous substances. The second part elaborates the biological characteristics, starting with habitats; species; and fishery resources. This general framework is delivered on the scientific basis, including referenced data, information, scientific publications and reports.

The information delivered within this document which is of special interest for the MSP process and PLASMAR project is:

- Sources of the environmental data, information and products, included in the report: (SeaWIFS Argo TIROS Unios System; EuroSITES Project; Satellite imagery - MODIS Land Rapid Response Team, NASA/GSFC; …);
- Description and classification of main habitats for Canarias;
- Level and type of habitats protection (Reservas marinas de interés pesquero, Reserva Mundial de La Biosfera, Lugares de importancia comunitaria, Zona de Especial Protección para Aves, Zonas Especial de Conservación - Natura 2000, Zona Marítima Especialmente Sensible);
- Cartography with protected level of habitats and related level of protection;
- Description of main species groups relevant for the archipelago;
- Level and type of protection (Listado de Especies Silvestres en Régimen de Protección Especial, Catálogo Español de Especies Amenazadas incluyendo especies En peligro de extinción y Vulnerable, Important Birds Area);
- Fishery resources and commercially exploited species;
- Catalogue of protected species for the Canary Islands.

3.2.2 Pressure & Impacts Analysis (Analisis de presiones e impactos II)

Document available at:
http://cdr.eionet.europa.eu/es/eu/msfd8910/msfd4text/envuhupia/II_Analisis_Presiones_Canarias.pdf/manage_document

"Análisis de presiones e impactos" is the document that identifies and analyses the main pressures, and their relations with accumulated impacts for the Canary archipelago. It provides solid basis for the establishing DPSIR framework (Drivers, Pressures, State, Impacts and Responses), describing the interactions between society (maritime and coastal activities) and the marine environment.

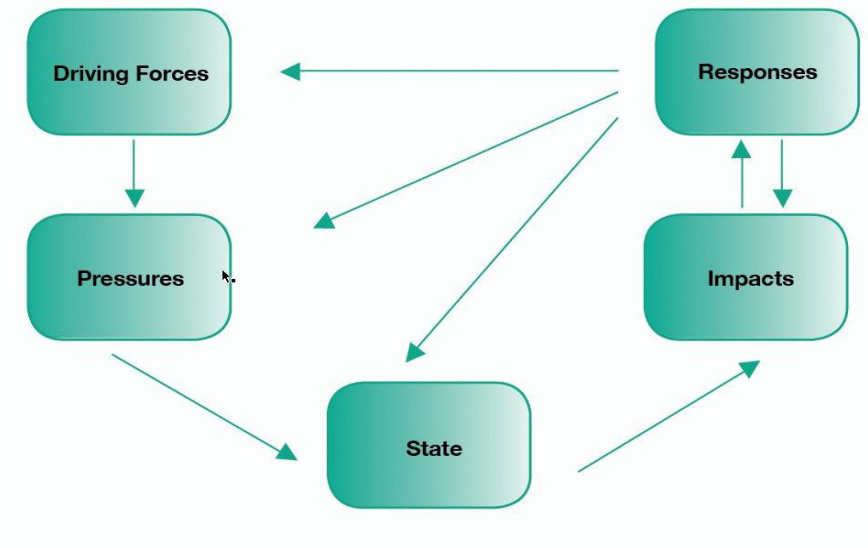

Figure 4 - DPSIR framework, source EEA

This document includes information on the major pressures jeopardizing the environmental status, that includes main maritime activities linking it to their presumed impact, defined and based on solid scientific knowledge. This analysis is done compiling the data and information published due to international (and European) commitments, including information published at the national and/or regional level.

With a pressure impact analysis, the impacts, related pressures and relevant quality descriptors (that should be used for the survey of environmental condition/status) are identified. Each relation is analysed in detail in the report. Due to the direct relation with PLASMAR project and task within action 2.1.1, we extracted a table with: anthropogenic maritime activities (aquaculture, maritime transport, maritime tourism, oil & gas sector…), type of the expected pressure(s), possible (accumulated) impact(s) and related quality descriptor(s).

Maritime Sector	Pressure	Impacts		QDs
Aquaculture	aquaculture breeding	Water column trophic level disturbance	Nutrient and organic matter enrichment/accumulation	1,5,6,8,9
Aquaculture	aquaculture breeding	Biological disturbance	Introduction of microbial pathogens	1,9
Aquaculture	aquaculture breeding	Biological disturbance	Introduction of non-indigenous species	1,2,3,4,6
Fisheries	artificial reefs & underwater structures	Physical loss	Sealing underwater constructions, anti-trawling artificial reefs	1, 6, 7
Fisheries	artificial reefs & underwater structures	Physical damage	Changes in siltation - dregging	1, 6, 7
Fisheries	extraction of the commercial species by bottom trawling	Physical damage	Abrasion (commercial fishing, boating, anchoring...)	1, 6, 7
Fisheries	anchoring	Physical damage	Abrasion (commercial fishing, boating, anchoring...)	1, 6, 7
Fisheries	marine refuse comming from fishery	Other physical disturbance	Marine litter	1,6,10
Fisheries	shipwrecks	Other physical disturbance	Marine litter	1,6,10
Fisheries	accidental fishery captures	Water column trophic level disturbance	Nutrient and organic matter enrichment/accumulation	1,5,6,8,9
Fisheries	extraction of the commercial species	Biological disturbance	Selective extraction of species	3,4
Fisheries	accidental fishery captures	Biological disturbance	Selective extraction of species	3,4
Maritime transport	material extraction - dragging	Physical loss	Smothering (e.g. by man-made structures, disposal of dredge spoil),	1, 6, 7
Maritime transport	Anchoring	Physical damage	Abrasion due anchoring	1, 6, 7
Maritime transport	Marine refuse comming from transport	Other physical disturbance	Marine litter	1,6,10
Maritime transport	Shipwrecks	Other physical disturbance	Marine litter	1,6,10
Maritime transport	Atmospheric deposition	Water column trophic level disturbance	Nutrient and organic matter enrichment/accumulation	1,5,6,8,9
Maritime transport	Ballast waters	Biological disturbance	Introduction of microbial pathogens	1,9
Maritime transport	invasive aquatic species attached to ships hulls and anchors	Biological disturbance	Introduction of non-indigenous species	1,2,3,4,6
Maritime transport	Ballast waters	Biological disturbance	Introduction of non-indigenous species	1,2,3,4,6
Port management	Harbor infrastructures & defense	Physical loss	Sealing (e.g. by permanent constructions).	1, 6, 7
Port management	Harbor infrastructures & defense	Physical damage	Changes in siltation (e.g. outfalls, dredging...)	1, 6, 7
Port management	material extraction - dredging	Physical damage	Abrasion (commercial fishing, boating, anchoring...)	1, 6, 7
Port management	material extraction - dredging	Physical damage	Selective extraction (exploitation of living and non-living resources...)	1, 6, 8
Port management	Harbor infrastructures & defense	Other physical disturbance	Underwater noise	1, 11
Port management	Navigation & harbor facilities	Other physical disturbance	Underwater noise	1, 11
Port management	dragged port material	Contamination by hazardous substances	Systematic and/or intentional release of substances	8,9
Maritime tourism	Anchoring	Physical damage	Abrasion (commercial fishing, boating, anchoring...)	1, 6, 7
Maritime tourism	extraction of the fishery species by recreational fishery	Biological disturbance	Selective extraction of species	3,4
Maritime tourism	recreational diving	Physical damage	Abrasion (commercial fishing, boating, anchoring...)	1, 6, 7
Maritime tourism	Anchoring	Physical damage	Abrasion (commercial fishing, boating, anchoring...)	1, 6, 7
Mining & mineral extraction	material extraction - dredging	Physical damage	Changes in siltation	1, 6, 7
Mining & mineral extraction	material extraction - dredging	Other physical disturbance	Underwater noise	1, 11
Oil & gas sector	Prospection, exploration and exploitation of Hydrocarbons	Physical loss	Sealing by permanent/temporary constructions.	1, 6, 7
Oil & gas sector	Prospection, exploration and exploitation of Hydrocarbons	Physical damage	Selective extraction (exploitation of living and non-living resources...)	1, 6, 9
Oil & gas sector	Prospection, exploration and exploitation of Hydrocarbons	Other physical disturbance	Underwater noise	1, 11
Oil & gas sector	Offshore platforms	Biological disturbance	Introduction of non-indigenous species	1,2,3,4,6
Submarine connection	Submarine cables	Physical loss	Smothering (e.g. by man-made structures, disposal of dredge spoil),	1, 6, 7
Submarine connection	Submarine cables	Other physical disturbance	Underwater noise	1, 11
Wind energy	Marine wind park	Physical loss	Sealing (e.g. by permanent constructions).	1, 6, 7

Table 1 - relation Maritime sector/pressures/impacts/quality descriptors

Finally, this document includes analysis of overlaps and integration with other EU Directives that apply on the sea.

The maps and spatial data of interest for MSP in Macaronesia and PLASMAR project used in the MSFD report are listed in the Annex 1 of this report. MAPAMA has an operational data infrastructure, including metadata catalogue that allows us to discover and download data. This metadata catalogue will be analyzed with the goal of discovering and including in PLASMAR infrastructure the relevant shared data within the action 2.2.1. http://www.mapama.gob.es/ide/metadatos/

3.2.3 Economic Social Analysis (Análisis Económico Social III)

Document available at:
http://cdr.eionet.europa.eu/es/eu/msfd8910/msfd4text/envuhupia/III_Analisis_Economico_y_Social_Canarias.pdf/manage_document

This study, analyzed data and assessed information which is relevant for PLASMAR project task 2.1.1a, analysis of projected Blue Growth requirements for the near future in Macaronesia. The study followed NAMWA methodology, developed by Brouwer *et al*. (2005) and Van der Veeren *et al*. (2004), which is already applied in the economic & social analysis for coastal waters done in the scope of Water Framework Directive 2000/60/EC. Analysis is done following these steps:

1. Description of the analyzed region, the Canary Islands
2. Description of the identified maritime sectors in the analyzed region
3. Identify and, if possible, quantify economic benefits due to the maritime sectors
4. Identify and, if possible, quantify impacts generated by the maritime sectors

This document identifies the following sectors in the terms of economic benefit and generated impact for the Canary islands region. , : fisheries (including aquaculture and transformation industry), harbor infrastructure, nautical sports, maritime transport, tourism, naval construction, oil and gas, water treatment, defense and renewable energy.

The analysis, information and data included in this study has been used for drafting 2.1.1a deliverable and to provide more exact projection for maritime sectors in Canarias and Macaronesia.

3.2.4 Quality Descriptors assessment IV

These documents (11 reports) provide detailed information for each quality descriptor, including data and information availability for Canarias. Reports include information on main pressures and finally, when possible, provide assessments in relation to the environmental thresholds. For some quality descriptors, it wasn't possible to provide neither assessment or environmental thresholds, due to the lack of specific indicator(s) data in 2012. Therefore, for some QD's, the assessments were delayed until the next reporting cycle in year 2018.

QD1 Biodiversity (DESCRIPTOR 1: BIODIVERSIDAD)
Document is available at:
http://cdr.eionet.europa.eu/es/eu/msfd8910/msfd4text/envuhupia/IV_D1_Canarias.pdf/manage_document

This document defines the meaning of "to maintain GES" (Good Environmental Status) in relation to the biodiversity, including habitat distribution, species distribution and ecological level. It provides initial assessment for 2012, and defines maritime traffic, fisheries and aquaculture as the most significant maritime anthropogenic pressures affecting marine biodiversity.

Data & Information
The species assessment is done with data delivered by acoustic campaigns that studied pelagic fish, studies undertaken in 1997-2002 through a number of doctoral research projects and studies delivered by the Ministry of the Environment.
For the habitats assessment, the data resources proceed from various studies and projects delivered in the region:

- The studies identified as *Ecocartográficos* are the most complete studies delivered between 2000 - 2007, financed by the Spanish Ministry of Environment and Cabildo Insular de Tenerife. *Ecocartográficos* extend study area until 50 meters of depth in the coastal waters in whole archipelago, including spatial data for all islands.
- GESPLAN, through a project from 2008, delivered a register of submerged and semi-submerged caves including the infralittoral reefs.
- Monitoring survey on vulnerable and threatened species *Poblaciones de Especies Amenazadas (SEGA).*
- Acoustic campaigns delivered from 1997-2002 by Viceconsejería de Pesca del Gobierno de Canarias, with aim to evaluate epipelagic y mesopelagic resources.
- Different campaigns between 2001 - 2008 at Reserva Marina Punta de la Restinga - Mar de Las Calmas (El Hierro), Reserva Marina Isla de La Graciosa y los Islotes del Norte de Lanzarote.
- La Laguna University delivered number of studies on *blanquizal* in 2002 and 2004.

Identified pressures:
Main identified pressures that affect the biodiversity of the Canary Islands are the construction of port infrastructures and maritime traffic, followed by tourism, fisheries and aquaculture.

Assessment:
Although the species are divided in the functional groups (birds, mammals, reptiles, fish and cephalopods), the assessment is delivered only for two species of reptiles: Tortuga boba (*Caretta caretta*) and Tortuga laúd (*Dermochelys coriacea*). Annex III includes information useful for the PLASMAR, such as a detailed list of the protected species, population tendency and relation to the international instrument of protection.

The habitats for the Canaries are classified into 14 classes using EUNIS hierarchy list, and an assessment is delivered for each of them including all indicators required by COM 2010/49/EC. Annex II provides a detailed description of the Canary archipelago habitats, including the habitat distribution maps.

ESTRATO BATIMÉTRICO	TIPO DE FONDO	HÁBITAT	RANGO BATIMETRICO	AREA
LITORAL	LITORAL ROCOSO	Comunidad tubo de lava	-	0,01 Km2
		Lagunas costeras	-	1, 73 km2
		Franja intermareal en sustrato rocoso	-	1.299 Km
INFRALITORAL	FONDOS DUROS	Comunidad de Antiphatella wollastoni	15-520 m	3,9 Km2
		Comunidad de cuevas submareales	0-70 m	0,09 Km2
		Facies de Leptogorgia spp. del infralitoral	10-190 m	10,2 Km2
		Fondos infralitorales duros de energía moderada dominados por el erizo de mar Diadema antillarum: "blanquizales"	0-80 m	476 Km2
		Infralitoral rocoso dominado por algas	no informatio n	211 Km2
	FONDOS BLANDOS	Caulerpales en fondos sedimentarios sublitorales	10-60 m	229,2 Km2
		Comunidad de anguila jardinera (Heteroconger longissimus)	17-70 m	143,3 Km2
		Comunidad de Bispira viola	20-70 m	5,7 Km2
		Fondos infralitorales blandos con maërl	0-120 m	90,5 Km2
		Praderas de Cymodocea en la Macaronesia	2-35 m	82,6 Km2
		Praderas de Halophila en las Islas Canarias	12-40 m	2,48 Km2

Table 2 - Basic classification of habitats for Canarias provided in the QD1 Biodiversity assessment report

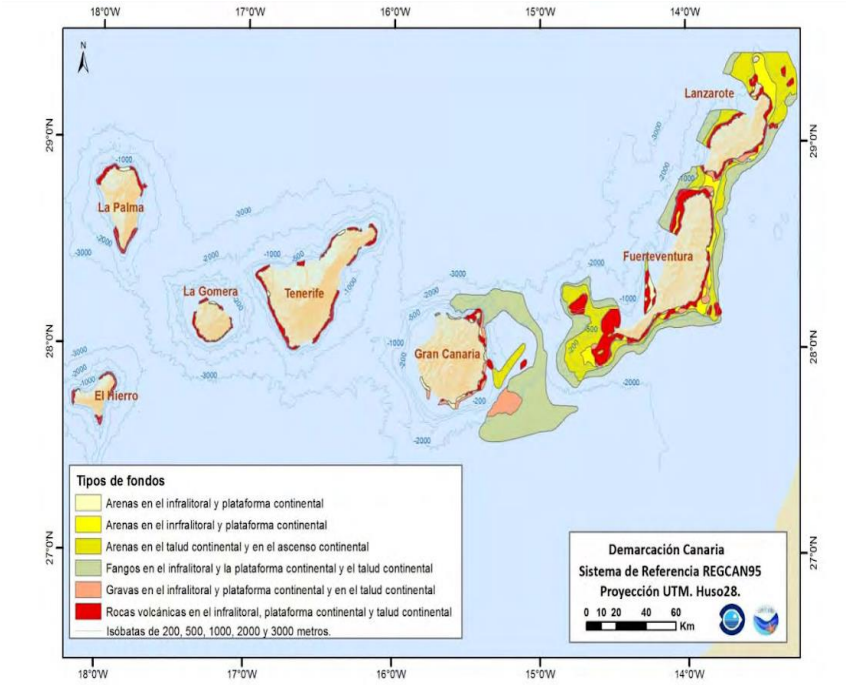

Figure 5 - Geomorphological synthesis for Canarias provided in the QD1 Biodiversity assessment report

QD2 Non-indigenous species (DESCRIPTOR 2: ESPECIES ALÓCTONAS)
Document available at:
http://cdr.eionet.europa.eu/es/eu/msfd8910/msfd4text/envuhupia/IV_D2_Canarias.pdf

This document defines and briefly discusses GES in relation to the presence of non-indigenous species, introduced species irreversibility issue and "status quo" situation as preferable. It provides a list of the non-indigenous species introduced in the Canaries with detailed descriptions and locations for the most relevant ones. It also includes information on accumulated impact and increasing trend of the non-indigenous organisms pressures. Data for this assessment is provided from various publications on non-indigenous species in the Canaries. The international data base on non-indigenous species distribution was also relevant. Spatial data on introduced communities location is relevant for the PLASMAR, as well as the list of detected spices delivered in 2012.

Algae	*Asparagopsis armata*	Briozoa	*Aetea anguina*
Algae	*Antithamnion diminuatum*	Briozoa	*Aetea ligulata*
Algae	*Asparagopsis taxiformis*	Briozoa	*Aetea longicollis*
Algae	*Bonnemaisonia hamifera*	Briozoa	*Aetea sica*
Algae	*Caulerpa racemosa var. cylindracea*	Briozoa	*Aetea truncata*
Algae	*Ceramium atrorubescens*	Briozoa	*Beania mirabilis*
Algae	*Ceramium cingulatum*	Briozoa	*Bugula avicularia*
Algae	*Codium fragile fragile*	Briozoa	*Bugula fulva*
Algae	*Colpomenia sinuosa vara. peregrina*	Briozoa	*Bugula neritina*
Algae	*Corynophlaea cystophorae*	Briozoa	*Bugula simplex*
Algae	*Dipteroshiphonia dendritica*	Briozoa	*Bugula stolonifera*
Algae	*Grateloupia doryphora*	Briozoa	*Chorizopora brongniartii*
Algae	*Grateloupia imbricata*	Briozoa	*Electra pilosa*
Algae	*Grateloupia turuturu*	Briozoa	*Escharina vulgaris*
Algae	*Gymnophycus hapsiphorus*	Briozoa	*Fenestrulina malusii*
Algae	*Laurencia caduciramulosa*	Briozoa	*Membranipora tuberculata*
Algae	*Neosiphonia harveyi*	Briozoa	*Microporella ciliata*
Algae	*Predaea huismanii*	Briozoa	*Puellina innominata*
Algae	*Scinaia acuta*	Briozoa	*Reptadeonella violacea*
Algae	*Scytosiphon dotyi*	Briozoa	*Schizoporella errata*
Algae	*Stypopodium schimperi*	Briozoa	*Schizoporella unicornis*
Algae	*Undaria pinnatifida*	Briozoa	*Scruparia ambigua*
Algae	*Womersleyella setacea*	Gasteropoda	*Haminoea callidegenita*
Anfipoda	*Caprella scaura*	Gasteropoda	*Terebra corrugata*
Tunicata	*Botrylloides leachi*	Myxozoa	*Sphaerospora testicularis*
Tunicata	*Botryllus schlosseri*	Teleostea	*Argyrosomus regius*
Tunicata	*Cystodytes dellachiajei*	Teleostea	*Dicentrarchus labrax*
Tunicata	*Diplosoma listerianum*	Teleostea	*Monodactylus sebae*
Tunicata	*Microcosmus squamiger*	Teleostea	*Pomacanthus maculosus*
		Teleostea	*Sparus aurata*

Table 3 - list of detected non-indigenous species for Canarias provided in the QD2 Non-indigenous species assessment report (2012)

QD3 The population of commercial fish species (DESCRIPTOR 3: ESPECIES MARINAS EXPLOTADAS COMERCIALMENTE)
Document available at:
http://cdr.eionet.europa.eu/es/eu/msfd8910/msfd4text/envuhupia/IV_D3_Canarias.pdf

Document defines GES for the populations of commercial fish species. It provides a list of the commercial fish species for the Canaries, and assessment for the species, where stocks/catches are well documented - (available data on mortality, ratio biomass & catch, population & size distribution), listed in Table 4.

Especie / *Stock*	Nombre común	% Desembarque	Evaluada
Katsuwonus pelamis	Bonito	33,26	Si
Scomber colias	Caballa	8,74	No
Thunnus alalunga	Barrilote	6,62	Si
Sparisoma cretense	Vieja	5,66	No
Acanthocybium solandri	Peto	3,61	No
Thunnus albacares	Rabil	2,91	Si
Thunnus obesus	Tuna	2,80	Si
Sardina pilchardus	Sardina de ley	2,08	No
Sardinella aurita	Alacha	1,69	No
Dentex gibbosus	Pargo	1,41	No
Pagrus pagrus	Bocinegro	1,31	No
Sarpa salpa	Salema	1,30	No
Engraulis encrasicolus	Anchoa	1,27	No
Muraena augusti	Morena negra	1,18	No
Trachurus picturatus	Chicharro	1,06	No
Spondyliosoma cantharus	Chopa	1,01	No

Table 4 - list of commercial fish species, and if data on mortality, ratio biomass & catch, population & size distribution is well documented. Provided in the QD3 The population of commercial fish species assessment report

QD 4 Elements of food webs (DESCRIPTOR 4: REDES TRÓFICAS)
Document available at:
http://cdr.eionet.europa.eu/es/eu/msfd8910/msfd4text/envuhupia/IV_D4_Canarias.pdf

Document on QD 4 states this descriptor is the most difficult to interpret and assess. There are significant difficulties to obtain data on productivity of key species and proportion of selected species on the top of the food web. Data on abundance/distribution are only available for tunas. Principal pressure on the food webs are coming from fisheries, but the trophic balance can become unstable due to the introduction of new species (aquaculture or the transport). Due to lack of data and information needed for the assessment of most of the group species, the GES is not quantified or referenced.

QD5 Eutrophication (DESCRIPTOR 5: EUTROFIZACIÓN)
Document available at:
http://cdr.eionet.europa.eu/es/eu/msfd8910/msfd4text/envuhupia/IV_D5_Canarias.pdf

This report is delivered using data and assessments done for the coastal waters in the scope of the WFD implementation. Identified pressures are: terrestrial point (residual and industrial waters) and diffuse sources (agriculture), atmospheric disposure and finally, maritime pressures (as aquaculture). Using satellite imagery for period 2002 - 2010, with daily frequency, assessing the chlorophyll concentrations, a total of 3 zones were established in accordance to trophic productivity: zone directly influenced by west African coastal blooms; interface zone; occidental zone with no enrichment. This map with zones classification by productivity is of high interest for MSP process in Canarias and PLASMAR, including spatial data on residual water point pressures. At the end of report is stated that there is not enough data to define relation pressures (amount of introduced nutrients) and impacts (biomass enrichment according to chlorophyll *a* measurements) to provide unambiguous coastal waters assessments. Therefore, chlorophyll *a* data (measured by satellite imagery) never exceed the values established as a threshold for the good ecological status. The report concludes that there are no eutrophication problems for the Canary coastal and marine waters and this is a state that should be preserved.

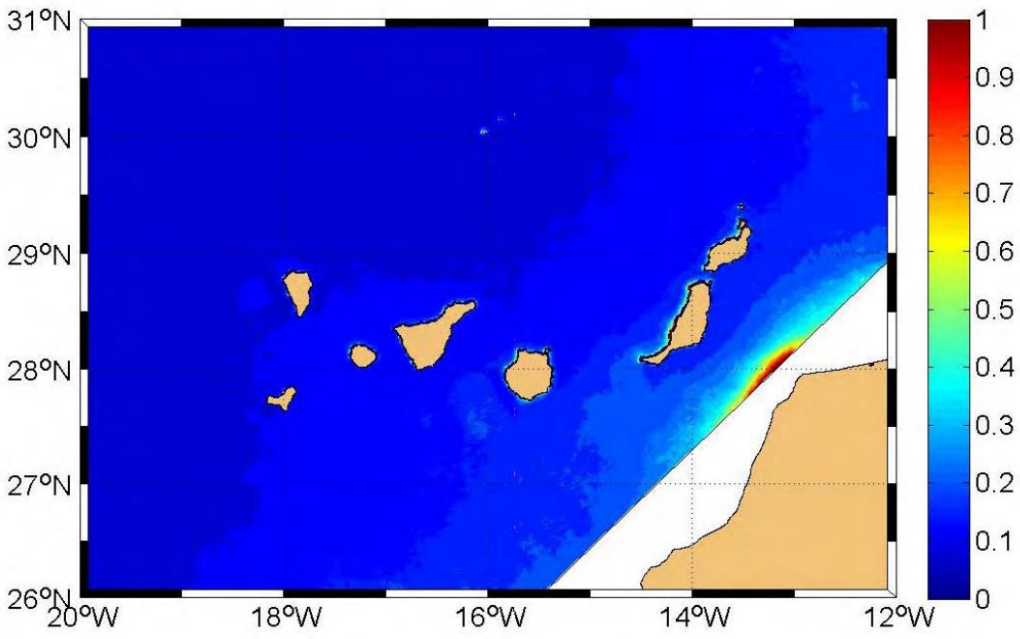

Figure 6 - Chlorophyll distribution estimated on the daily frequency campaigns 2002-2010, delivered by MODIS- Aqua, included in the QD5 Eutrophication assessment report

This report includes map and table with the types of coastal water bodies for the Canaries (Ecotipos de aguas costeras) that are established on a hydrodynamic basis - currents exposure. This spatial data provide significant information that should be used within project PLASMAR and considered during MSP process in Canarias.

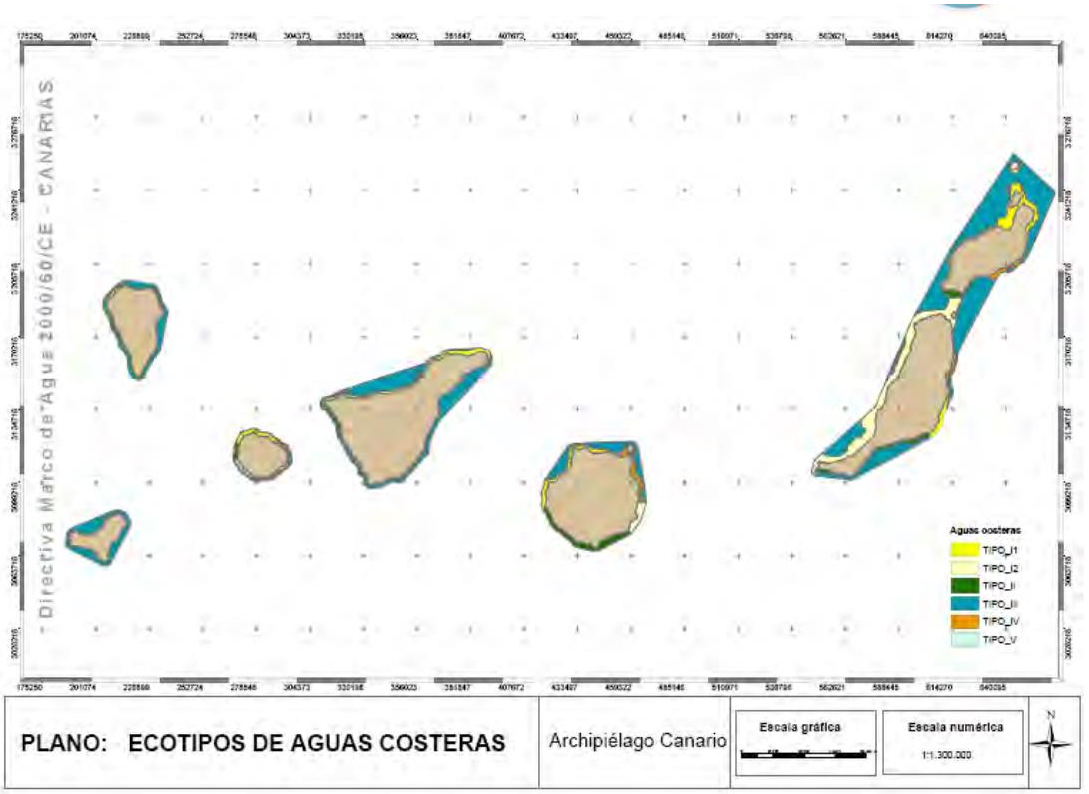

FIgure 7 - Classification of Canarias coastal water bodies, provided in WFD report (2005), included in the QD5 Eutrophication assessment report

QD6 The seafloor integrity (DESCRIPTOR 6: FONDOS MARINOS)
Document available at:
http://cdr.eionet.europa.eu/es/eu/msfd8910/msfd4text/envuhupia/IV_D6_Canarias.pdf

The document defines the seafloor integrity descriptor including criteria classification; seabed physical loss & disturbance and benthic community extension & condition. Maritime activities that are identified as main pressures are:

- Extraction of marine mineral deposits - maritime substrate extraction
- Dredged material dumping
- Cables
- Artificial reefs
- Harbour infrastructure and defense
- Aquaculture anchoring
- Anchoring
- Fishery

The document states that the reference values cannot be established, nor an assessment be properly delivered due limited data availability and data adequacy. The description clearly relates the seafloor integrity with QD 1 on biodiversity/habitat & species level. Data sources on habitat distribution are the same as those used for the

QD1: Ecocartogarficos, GESPLAN and SEGA. For a proper assessment of the QD6 detailed data with info on identified pressures is required:

- For fisheries pressure, the Vessel Monitoring by Satellite (VMS) system for time period 2007-2010 was used. This system is compulsory to be installed only on the vessels that are exceeding 15 meters, and most of the Canarian fishing fleet does not exceed 10 meters. This method needs to be substituted with another one.
- Spatial data included in the Annex I includes cables, artificial reefs, dredging disposed material, harbour dredging operations and facilities, anchoring zones, aquaculture floating facilities, were obtained by Centro de Estudios y Experimentación de Obras Públicas (CEDEX)

INDICADOR: AREA OCUPADA (km^2)	
HÁBITAT	**NIVEL DE REFERENCIA**
Fondos rocosos infralitorales dominados por algas	211 km^2
Comunidad de *Antiphatella wollastoni*	3,9 km^2
Facies de *Leptogorgia* spp	10,2 km^2
Praderas de *Cymodocea* en la Macaronesia	82,6 km^2
Praderas de *Halophila* en las Islas Canarias	2,48 km^2
Fondos infralitorales blandos con maërl	90,5 km^2

Table 5 - Assessment is done only for 6 type of 11 sublittoral habitats due data availability and habitat sensibility/vulnerability

Annex 1 includes the tables with assessment for the 6 sublittoral habitats vs maritime activities.

QD7 Hydrographical Conditions (DESCRIPTOR 7: CONDICIONES HIDROGRÁFICAS)

Document available at:
http://cdr.eionet.europa.eu/es/eu/msfd8910/msfd4text/envuhupia/IV_D7_Canarias.pdf

Hydrographic conditions are characterized by the physical parameters of seawater: temperature, salinity, depth, currents, waves, turbulence and turbidity. They may however be affected by human induced pressures, especially in coastal areas, due the infrastructure construction on the coast, sand extraction, changes in freshwater riverine inputs and release of large quantities of warm or salty water.
The most significant change in the hydrographical conditions is ocean temperature increase, due the global climate change. Local infrastructures on the coast, related pressure and currents modifications, salinity increase/decrease have limited effects, that should be reduced or remain the same. Data used for this report, global scale products on ocean temperature (by NOAA and MyOCEAN).

QD8 Concentrations of contaminants (DESCRIPTOR 8: CONTAMINANTES Y SUS EFECTOS)
Document available at:
http://cdr.eionet.europa.eu/es/eu/msfd8910/msfd4text/envuhupia/IV_D8_Canarias.pdf

Contaminants are defined in the European legislation as: "substances (i.e. chemical elements and compounds) or groups of substances that are toxic, persistent and liable to bio-accumulate and other substances or groups of substances which give rise to an equivalent level of concern" (WFD). This reports states that for the next assessment (2018) a monitoring programme will be developed, but in 2012 assessment, only results of few research and doctoral thesis were available.

QD9 Contaminants in seafood are below safe levels (DESCRIPTOR 9: CONTAMINANTES EN PRODUCTOS DE LA PESCA)
Document available at:
http://cdr.eionet.europa.eu/es/eu/msfd8910/msfd4text/envuhupia/IV_D9_Canarias.pdf

Similar situation as for QD8, report states a need for the monitoring programme on contaminants in the sea food level. The control of the seafood is functional, but does not include information on fishing grounds. Few doctoral studies and research projects are the only source of data for the assessment for the whole archipelago.

QD10 Marine litter (DESCRIPTOR 10: BASURAS MARINAS)
Document available at:
http://cdr.eionet.europa.eu/es/eu/msfd8910/msfd4text/envuhupia/IV_D10_Canarias.pdf

Similar situation as for QD8 & QD9. The report states a need for a consistent monitoring programme on marine litter. The assessment is not provided due the lack of data and information form most of the GES indicators. The assessment is delayed until the second cycle of implementation MSFD - assessment scheduled for 2018.

QD11 Energy including Underwater Noise (DESCRIPTOR 11: RUIDO SUBMARINO)
Document available at:
http://cdr.eionet.europa.eu/es/eu/msfd8910/msfd4text/envuhupia/IV_D11_Canarias.pdf

This report is mainly centered on marine underwater noise, although QD11 includes introduction of light, heat, electromagnetic radiation, radio waves or vibrations. The report provides a list of the main sources of marine noise, including scientific research, seismic and sonar exploration, maritime construction, aquaculture, fishery and maritime navigation & transport.
In 2012, available data did not provide enough information for the assessment of the pressure, impact and state in relation to the marine underwater noise. Data & information required for the assessment needs to be collected with monitoring campaigns combined with models on noise exposure.
The delivered assessment on noise accumulation from maritime transport is done on AIS and VMS data, included in the *Figure 8 – Areas with identified accumulation of pressure that can provoke underwater noise.*

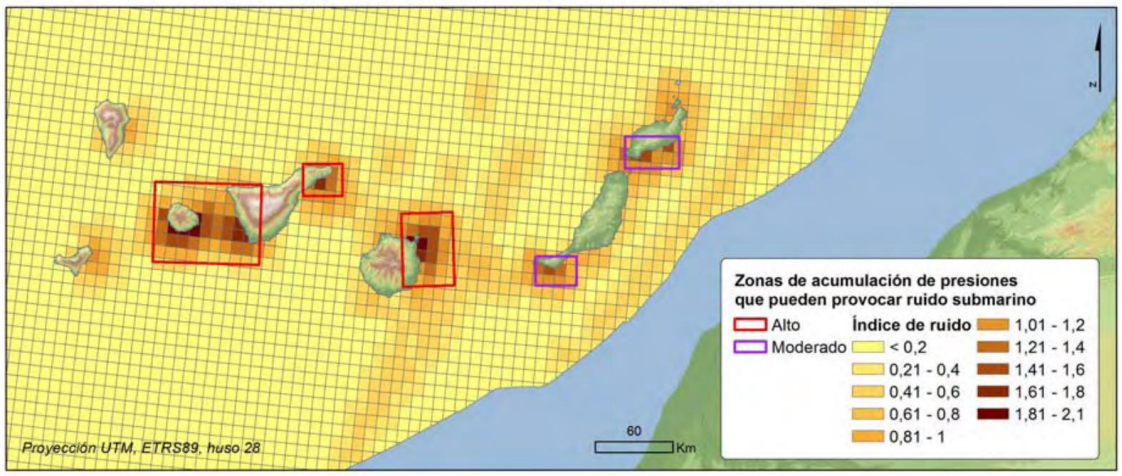

Figure 8 - Areas with identified accumulation of pressure that can provoke underwater noise. Figure included in the QD11 Energy including Underwater Noise assessment report

3.2.5 Environmental targets, included in the Spanish National legislation (Objetivos Ambientales Demarcación Marina Canaria)

OBJETIVOS AMBIENTALES APLICABLES A TODAS LAS ESTRATEGIAS MARINAS			
Objetivo general de la Ley 41/2010 de protección del medio marino (artículo 1.1)	Lograr o mantener el buen estado ambiental del medio marino, a través de su planificación, conservación, protección y mejora		
Objetivos específicos de las estrategias marinas (artículo 1.3 de la Ley 41/2010 de protección del medio marino)	A. Proteger y preservar el medio marino, incluyendo su biodiversidad, evitar su deterioro y recuperar los ecosistemas marinos en las zonas que se hayan visto afectados negativamente.	B. Prevenir y reducir los vertidos al medio marino, con miras a eliminar progresivamente la contaminación del medio marino, para velar por que no se produzcan impactos o riesgos graves para la biodiversidad marina, los ecosistemas marinos, la salud humana o los usos permitidos del mar.	C. Garantizar que las actividades y usos en el medio marino sean compatibles con la preservación de su biodiversidad.
Objetivos particulares para el desarrollo de las estrategias marinas	1. Asegurar la conservación y recuperación de la biodiversidad marina a través de instrumentos y medidas efectivos.	1. Adoptar y aplicar las medidas necesarias para que la introducción de materia o energía en el medio marino no produzca efectos negativos significativos sobre los ecosistemas ni los bienes y servicios provistos por el medio marino.	1. Asegurar que las políticas sectoriales y actuaciones administrativas con incidencia en el medio marino se desarrollan de manera compatible con el logro o mantenimiento del buen estado ambiental definido en las estrategias marinas.
	2. Lograr una red completa, ecológicamente representativa, coherente y bien gestionada de áreas marinas protegidas.	2. Adoptar y aplicar las medidas necesarias para lograr que las concentraciones de contaminantes se encuentren en niveles que no produzcan efectos de contaminación.	2. Adoptar y aplicar las medidas necesarias para minimizar el impacto de las actividades humanas en las condiciones físicas del medio marino.
	3. Garantizar la conservación de especies y hábitats marinos, especialmente aquellos considerados amenazados o en declive.	3. Mejorar el conocimiento científico de las causas-efectos e impactos en relación con introducción de materia o energía en el medio marino.	3. Promover un mejor grado de conocimiento de los ecosistemas marinos españoles y de su respuesta ante las actividades humanas, así como un mejor acceso a la información ambiental disponible.

Table 6 - Environmental objectives included in the marine strategies

Analyzing the report on *Canarias marine subregion environmental targets* we identified the following objectives relevant for the project development of the sustainable MSP in Macaronesia:

1. Within the first target - *Protect and preserve marine environment, including the biodiversity and ecosystem recovering*, second sub-target is pointing to planning and development of the Marine Protected Areas network.
2. The second target indicates the objective of decreasing pressures on the marine environment, to reduce impacts and risk for biodiversity and human use, including two identified sub-targets:
    a. Adopt and apply measures to reduce pressures and bring impacts on the sustainable level.
    b. Upgrade scientific knowledge on *pressure- impact* link.
3. Third target is to guarantee that the use of the marine space in done line with biodiversity preservation. All sub-targets are relevant for MSP (and PLASMAR) including the access to the marine environmental data & information.

Report is available:
http://cdr.eionet.europa.eu/es/eu/msfd8910/msfd4text/envuhvu4g/V_Objetivos_ambientales_Canaria.pdf

3.2.6 Metadata on data and assessment by 2012 (Article 8, Article 19)

Report links to the two metadata catalogues, one developed by Instituto Español de Oceanografia (IEO) and second one is a catalogue developed by MAPAMA. Report is only available as XML file, therefore this was analyzed with XML Viewer software. The report, XML file, is available for download:
http://cdr.eionet.europa.eu/es/eu/msfd8910/msfd4meta/envuzdwvg/AMAES_MSFD8_19_3_20130513.xml

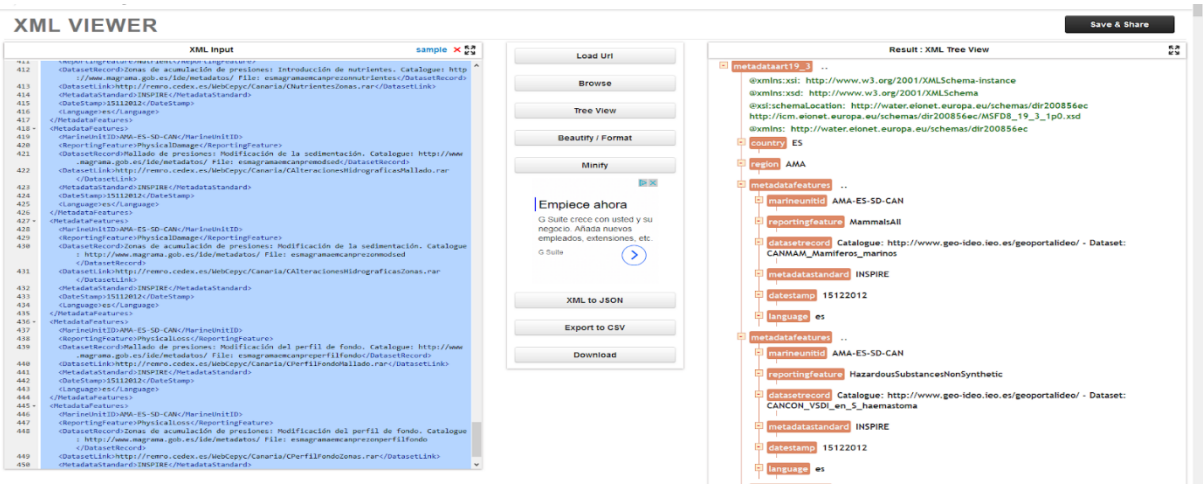

Figure 9 - reported xml file analyzed with xml viewer

XML file includes structured information - metadata for 54 reported datasets. For each dataset metadata attributes provides information on:

- *Marineunitid* - marine dataset iD - should be unique identifier of dataset
- *Reportingfeature* - it provides one keyword that include dataset topic/theme
- *Datasetrecord* - it provides link to metadata catalogue and name of dataset
- *Datasetlink* - available only for the data developed and shared by MAGRAMA (16 datasets), served and hosted by CEDEX
- *Metadatastandard* - standard used for the metadata development - for all metadata is claimed INSPIRE metadata standard, that is used in the catalogue
- *Datestamp* - not clear, date of publishing this xml file - same for all datasets - 15122012 - 15 of December 2012
- *Language* - Language used for the metadata and data

Six metadata records, managed in MAPAMA catalogue (http://www.mapama.gob.es/ide/metadatos/), includes direct link for data download that provides shp. files, with spatial information on:
salinity distribution, litter distribution, pathogens, alien species pressure, noise pressure, nutrients distribution, hydrographical modifications and bathymetry.

Searching the IEO metadata catalogue (http://www.geo-ideo.ieo.es/geoportalideo/catalog/main/home.page) we found that most of data is not available for download or neither through download services. Therefore, searching the IEO data infrastructure, were identified standard OGC view services (WMS):
http://barreto.md.ieo.es/arcgis/services/wms/wmsBase/MapServer/WMSServer?

This service includes data useful for the PLASMAR project and process of MSP: Coast line; Territorial sea; Contiguous zone; 200 Miles coast distance; Isobaths bathymetry; Spatial data on PSSA (Zona Marítima Especialmente Sensible); Marine reserves; Seabed nature.

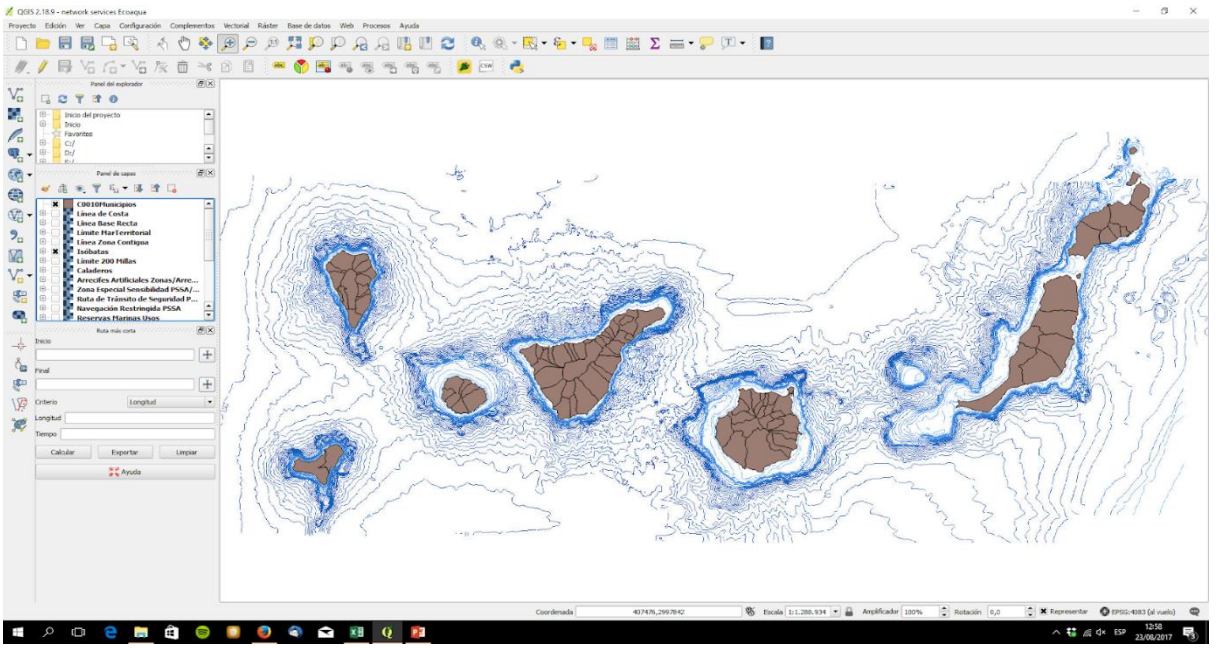

Figure 10 - invoked IEO WMS service on bathymetry data, on the local GIS

Both metadata catalogues and data will be in detail analyzed (data quality, coverage, usability for PLASMAR project and in MSP process, etc.) within the action 2.2.*1 Analyses of data & information availability in scope of MSP*.

IV. Monitoring

4 Marine Strategy Framework Directive: monitoring programmes

Article 11 of the Marine Strategy Framework Directive (2008/56/EC) provides legally-binding requirements for Member States to establish and implement coordinated monitoring programmes for the ongoing assessment of the environmental status of marine waters.
Monitoring programmes were established and made operational to follow environmental status, but also efficiency of implemented measures for obtaining environmental targets. Report on monitoring programmes were scheduled for October 2014 and reporting envelope includes three folders:

1. Text-based national 'paper' report - (last update 23/06/2015);
2. Sub-collection folder for each Marine region and/or sub-region with uploaded tabular data - data provided following xml schemas - (last update 28/08/2015);
3. Geographical data and regional cooperation_MSFD4Geo - This folder is empty

Envelope is available:
http://cdr.eionet.europa.eu/es/eu/msfd_mp

4.1 Text-based national 'paper' report

Text based reports are referring on all Spanish subregions (Mediterranean, Atlantic and Canaries) and this envelope/folder includes 17 files:

1. VI - Introduction -
    a. Annex VI - includes public consultation on marine monitoring
2. VI.1. Indicators - Description of indicators related to the GES

. Annex VI.1- Descriptive sheets on indicators

3. VI.2 Existing monitoring programmes - description of already operative monitoring programmes

. VI.2 - eight documents with descriptive sheets on already operative monitoring programmes

4. VI.3 Proposal for monitoring programmes

. That includes annex document (5) with descriptive sheets for each sub-region

Documents VI, VI.1, VI.2, VI.3 are available:
http://cdr.eionet.europa.eu/es/eu/msfd_mp/msfd4text/envvpbdra/VI_ProgramasSeguimiento.pdf

4.1.1 VI - Introduction

Includes introduction to the topic and describes the structure of the reported documents. It explains how the information gathering from the Spanish sub-regions –divided in Mediterranean Sea and Atlantic Ocean– was coordinated.
Regional cooperation on marine monitoring with European countries is done in the framework of Regional Sea Convention's (RSC) - Oslo-Paris Convention (OSPAR) and Barcelona Convention. As the Spanish sub-region of Canarias is not part of OSPAR, its affairs with Madeira, Portugal (also not part of OSPAR) are managed on a bilateral basis.

The proposal for the MSFD Monitoring programmes are delivered by various parallel processes:

1. Scientific- technical discussions on the MSFD indicators
2. Gathering information on already operational monitoring programmes
3. Proposal on MSFD monitoring programmes and related sub-programmes
4. Discussion with authorities who have the responsibility (e.g. in the sub-region) for each part of the monitoring

This document also briefly explains the assessment of the Monitoring efforts and required budget, that results with a basic strategy for the marine monitoring for Spain. Spain has a jurisdiction for marine waters area that exceeds 1 million km², which makes it difficult and extremely costly to monitor entirely. **Monitoring strategy for the assessment of marine areas will be don**e:

1. **By survey of the areas that are identified in risk due to the accumulation of pressures and impacts (identified as part of MSFD implementation - requirement scheduled for 2012) ; and**
2. **Survey of the areas of special natural value/interest.**

It is clearly stated that there is a need for the cost efficiency monitoring strategy, which needs to be financed by European financial instruments such as the programme LIFE, European Maritime and Fisheries Fund, Horizon 2020, or by European Regional Development Fund.
The document also includes an annex with statements of different Spanish institutions, gathered during the public consultation process.

4.1.2 VI.1. Indicators proposal

Indicators proposal is following European Commission decision 2010/477/EU on criteria and methodological standards on good environmental status (GES) of marine waters. Nevertheless, indicators previously established due to the implementation of the WFD, Habitat Directive, Bird Directive and in the frame of RSC's were included or at least taken into account to ensure their compatibility.

European Commission decision 2010/477/EU was amended in 2017 and substituted by new document on GES: Commission Decision (EU) 2017/848 laying down criteria and methodological standards on good environmental status of marine waters and specifications and standardized methods for monitoring and assessment, and repealing Decision 2010/477/EU. This amendments, modifications of legal document require analysis of proposed indicators compatibility with the amended GES document.

List of proposed indicators and related details are available at:
http://cdr.eionet.europa.eu/es/eu/msfd_mp/msfd4text/envvpbdra/VI.1_Anexo_FichasIndicadores.pdf
The indicator sheets Includes detailed information for each indicator, formal description, required parameters to measure, equation for integrating parameters into indicators, units, quality descriptor/criteria/indicator, relation to the environmental targets, if already operational, if reference level is established and what is a method for establishing ref. level.

4.1.3 VI.2 Existing monitoring programmes

This document consists of a list and a detailed description of already operative monitoring programmes in Spanish coastal and marine areas. Operative monitoring programmes are established due implementation of the diverse European environmental legislation that applies on marine and coastal waters as WFD, Bird, Habitat, Nitrate, Residual water Directive, etc. Regional Sea Conventions also require ocean/sea monitoring such as the programmes MEDPOL (the marine pollution assessment and control component of Mediterranean Action Plan, Barcelona Convention) and RID (Riverine Inputs and Direct Discharges, OSPAR). Further, the recollection of fishery sector data, included in *Data Collection Framework* as a part of the Common Fishery Policy is analyzed. Finally, this study includes a list and analysis of activities developed by research centers and universities, as voluntary initiatives - citizen science & crowdsourcing. The final goal of this study is to identify and list already operative surveys/monitoring and to integrate results, collect data & information for successful marine environmental management within implementation of the MSFD.

It includes a list of operative monitoring programmes at Canarias with a potential to be used within the PLASMAR project, in relation to the methodologies, results, assessment or coverage of sea area. Using data, information, results & assessments form already operative/finalized project and surveys, has a significant advantage but also difficulties as data is not standardized and usually derived information is fragmented.

Operative programmes on biodiversity - species:

1. Project AVISTEME coordinated by Universidad de La Laguna, Canarias, consists of a centralized register of mammals sightings.
2. Programmes on survey of marine of turtles at the Marine reserve of La Graciosa, north of Lanzarote area, and marine reserve in the La Palma island. (sheets 007l, 007p)
3. Instituto Español de Oceanografía (IEO) in period 2003-2010, organized species observing from local fisheries boats, in the framework of the marine reserves
4. Statistik survey through *Red de información y Muestreo del IEO* (IEO Network of survey and information)
5. Observing species programme - fish and cephalopod (2009 - 2015 was operative) for the Marine Reserve of La Palma

Operative programmes on biodiversity - benthic habitat:

1. Research campaigns delivered by IEO included in the sheets 205, 237 and 238 (neither one of reported programmes is operative at Canarias)

Operative programmes on biodiversity - pelagic habitat:

1. IEO-Radiales (Canarias) RADPROCAN (032)

Operative programmes on Elements of food webs:

- There is no information on operative programme for Canaries. At the national level IEO-Radiales includes programmes for other Spanish sub-regions described with sheets 029 and 031.

Operative programmes on Non-indigenous species:

- No information on operative programmes for Canarias, existing data is proceeding from specific research studies on limited areas

Operative programmes on commercial fish species:

1. Data gathering developed through Data Collection Framework with Common Fishery Policy
2. *Plan de Gestión para las aguas exteriores de Fuerteventura 2013-2014*, Management plan for Fuerteventura offshore area
3. *Programa Nacional de Datos Básicos Seguimiento de la actividad pesquera profesional y recreativa* - Operative for North coast of Lanzarote
4. Survey on biological indicators - Marine reserve La Palma
5. Survey on biological indicators - Marine reserve La Restinga
6. Artisanal fishery survey for Canarias
7. Professional and recreational fishery surveys in the marine reserve Graciosa and North of Lanzarote

Operative programmes on eutrophication:

1. Programme RADPROCRAN (sheet 032) - not enough for assessment of the archipelago due the spatial coverage and parameters measured (not included chlorophyll *a*)

Operative programmes on hydrographical conditions:

- Operative monitoring are related to the GOOS and MyOcean, measuring basic marine, environmental parameters (e.g. temperature):

1. Maritime - terrestrial monitoring described into sheets 019,057,072,157,172,173,174.
2. Campaigns on evaluation of fishing resourses - sheets 205, 237, 238, 239, 240, 314
3. Regular campaigns included in the project RADIALES sheets 029 and 033
4. Operative oceanographical buoy network managed by Puertos del Estado, sheets 019, 025, 035, 050, 051, 073
5. Currentmetres network, run by Puertos del Estado, sheets 022, 084
6. Floating buoys, ARGO and gliders, sheets 023, 058
7. Altimetry measured by tide gauges, sheets 035, 047, 048 and 049
8. Coastal radars and satellites, sheets 093, 094, 036 y 057

Operative programmes on Concentrations of contaminants:

1. Operative programmes are related to the WFD or requirements related to the RSC, unfortunately not operative in Canarias - sheets 017, 041, 083, 086, 087, 143, 168, 169, 181 and 186

Operative programmes on Contaminants in seafood:

1. The report does not included all five Spanish sub-regions, but control is operative through two programmes “Programa de Control Oficial de Higiene de la Producción Primaria en Pesca Extractiva” and “Programa de Control de Biotoxinas Marinas en Productos”

Operative programmes on marine litter:

1. OSPAR programmes;
2. IEO runs a number of projects with topic on marine litter DEMERSALES, sheet 205, MEDITS, sheet 238 and PELACUS, sheet 239
3. Project MARNOBA (sheet 126).
4. Initiatives by foundations Project Aware (sheet 129) and Surfrider Europe (sheet 315).

Operative programmes on underwater noise

Running projects details in sheets 119, 043, 117, 118, 148 and 149

Operative programmes related to the pressures

1. Programa RID, sheet 014, data on nutrient and priority substances(contaminants) continental pressure in coastal waters - *Censo de puntos de vertidos*

Operative programmes on human activity

1. Spanish Ministry of Industry, Energy and Tourism (sheet 229) gather data on concessions, exploration and exploitation of hydrocarbons in sea/ocean
2. MAGRAMA follows aquaculture facilities
3. Harbour and ports dredging sites data (sheet 229) run by CEDEX and Puertos del Estado
4. Fishing activity surveyed by Universidad de la Laguna and IEO
5. VMS - fishing monitoring including boats >15m

Sheets with operative monitoring programmes are available:
VI.2_Anexo4_Fichas01-50.pdf
http://cdr.eionet.europa.eu/es/eu/msfd_mp/msfd4text/envvpbdra/VI.2_Anexo4_Fichas01-50.pdf/manage_document
VI.2_Anexo4_Fichas051-100.pdf
http://cdr.eionet.europa.eu/es/eu/msfd_mp/msfd4text/envvpbdra/VI.2_Anexo4_Fichas051-100.pdf/manage_document
VI.2_Anexo4_Fichas101-150.pdf
http://cdr.eionet.europa.eu/es/eu/msfd_mp/msfd4text/envvpbdra/VI.2_Anexo4_Fichas101-150.pdf/manage_document
VI.2_Anexo4_Fichas151-200.pdf
http://cdr.eionet.europa.eu/es/eu/msfd_mp/msfd4text/envvpbdra/VI.2_Anexo4_Fichas151-200.pdf/manage_document
VI.2_Anexo4_Fichas201-250.pdf
http://cdr.eionet.europa.eu/es/eu/msfd_mp/msfd4text/envvpbdra/VI.2_Anexo4_Fichas201-250.pdf/manage_document
VI.2_Anexo4_Fichas251-300.pdf
http://cdr.eionet.europa.eu/es/eu/msfd_mp/msfd4text/envvpbdra/VI.2_Anexo4_Fichas251-300.pdf/manage_document
VI.2_Anexo4_Fichas300-317.pdf
http://cdr.eionet.europa.eu/es/eu/msfd_mp/msfd4text/envvpbdra/VI.2_Anexo4_Fichas300-317.pdf/manage_document

4.1.4 VI.3 Proposal for monitoring programmes

This proposal follows the structure on GES monitoring programmes & sub- programmes delivered by the technical MSFD working groups. Te established structure is based on the following principle - one monitoring programme per quality descriptor, except descriptors on biodiversity (1, 4 and 6). Biodiversity descriptors should be covered with structure of monitoring programme per each component of biodiversity: birds, mammals, reptiles, fish and cephalopods, benthic and pelagic habitats.
Each monitoring programme includes monitoring sub-programmes as necessary, to cover survey strategy, needed frequency, methods etc.
Current proposal includes transversal monitoring sub-programmes for pressures, impacts and anthropogenic activities.
Proposal includes requirements, established methodologies and cross-border coordination of the regional sea conventions - OSPAR and Barcelona Convention.

Proposal includes 13 monitoring programmes:

1. AV. Biodiversidad-Aves D1, D4, D6 - biodiversity; birds
2. MT. Biodiversidad- Mamíferos y tortugas D1, D4, D6 - biodiversity; mammals and reptiles,
3. PC. Biodiversidad- Peces y cefalópodos D1, D4, D6 - biodiversity; fish and cephalopods,
4. HB. Biodiversidad- Hábitats bentónicos D1, D4, D6 - biodiversity; benthic habitats.
5. HP. Biodiversidad- Hábitats pelágicos D1, D4, D6 - biodiversity; pelagic habitats
6. EAI. Especies alóctonas D2 - Non-indigenous species
7. EC. Especies comerciales D3 - Commercial fish species
8. EUT. Eutrofización D5 - Eutrophication
9. AH. Alteraciones hidrográficas D7 - Alteration of hydrographical conditions
10. CONT. Contaminantes D8 - Concentrations of contaminants
11. CP. Contaminantes en el pescado D9 - Contaminants in seafood
12. BM. Basuras marinas D10 - Marine litter
13. RS. Ruido submarino D11 - Underwater noise

For each monitoring programme the following information is provided:

1. General description;
2. Proposed monitoring sub-programmes;
3. Description of the proposed monitoring sub-programmes.

Proposal is developed for each Spanish sub-region separately. Sheets with details on proposed monitoring sub-programmes for Canarias are available:
http://cdr.eionet.europa.eu/es/eu/msfd_mp/msfd4text/envvpbdra/VI.3_Anexo5_SubprogramasAMAES-CAN.pdf
The monitoring programmes proposal is done on the basis of expert's/scientific work. Even the final version includes filter due the identified priorities and available budget. Current proposal is based on the next premises:

- Partial or limited monitoring, with progressive increasing of survey area or number of sub-programmes
- Initiate pilot monitoring in reduced areas or only one from five Spanish sub-region, with progressive expansion strategy

- Dely some monitoring processes for second cycle of MSFD implementation (2018-2024)

It should be defined with the interview (MAGRAMA - MSFD competent authority) which monitoring programmes/sub-programmes are operational and covered area in Macaronesia, within the end of the first implementation cycle.

4.2 Proposed monitoring programmes - sub-collection folder for Canarias - data provided following xml schemas

Canarias proposed monitoring programmes, and related amendments (2014-2015) are available as a structured information- XML files at envelope, that are analyzed: http://cdr.eionet.europa.eu/es/eu/msfd_mp/amaes/

Analysis of XML reported files, lists 69 proposed monitoring sub-programmes within 13 monitoring programmes. The monitoring programmes and related sub-programmes are listed in tables 7 - 15. Number of sub-programmes are described in details with corresponded separate XML file. Analyzing we found that all sub-programmes should be operative latest in 2017 and most of them claim open data access. Each sub-programme sheet provides information with name & description of sub-programmes, including spatial scope, when survey started to be operational, sampling frequency, parameters analyzed, monitoring and analysis method. XML files incorporate details on data information access, including type of data, access mechanism, rights, year/date of availability, INSPIRE theme and finally description of access. However, for most of the sub-programmes - XML files, due information included, it was not possible to access to monitoring results, raw or even aggregated data.

Proposed monitoring programmes (on marine environment, maritime activities and programmes on pressures) are significantly relevant for development of the sustainable maritime and environmental planning. Project PLASMAR, within action *2.2.1. Analyses of data & information availability in scope of MSP* will identify which of proposed monitoring programmes/sub-programmes are operational, whenever collected and aggregated data is available.

Monitoring programme	submonitoring programme id	submonitoring programme name
AV. Biodiversidad-Aves D1, D4, D6 - biodiversity; birds	AMAES-CAN-AV-3_Censosmar	Mobile species - population characteristics
	AMAES-CAN-AV-4_Interaccionpesca	Mobile species - mortality/injury rates from fisheries (targeted and/or incidental)
	AMAES-CAN-AV-5_DatosAdicionales	Other (additional information)
	AMAES-CAN-ACT-1_PescaMaritima	Activities extracting living resources (fisheries including recreational, maerl, seaweed)
	AMAES-CAN-OP_ObjetivosOperativos	Other
Monitoring programme	**submonitoring programme id**	**submonitoring programme name**
MT. Biodiversidad- Mamíferos y tortugas D1, D4, D6 - biodiversity;mammals and reptiles,	AMAES-CAN-MT-1_CetCosteros	Mobile species - abundance and/or biomass
	AMAES-CAN-MT-2_CetOceanicos	Mobile species - abundance and/or biomass
	AMAES-CAN-MT-3_Tortugas	Mobile species - abundance and/or biomass
	AMAES-CAN-MT-4_InteraccionPescaMamTortugas	Mobile species - population characteristics
	AMAES-CAN-MT-5_Varamientos	Mobile species - population characteristics
	AMAES-CAN-RS-1_RuidoImpulsivo	Acute underwater noise - distribution, frequency and levels
	AMAES-CAN-RS-2_RuidoAmbiente	Diffuse underwater noise - distribution, frequency and levels
	AMAES-CAN-ACT-1_PescaMaritima	Activities extracting living resources (fisheries including recreational, maerl, seaweed)
	AMAES-CAN-ACT-5_Navegacion	Sea-based mobile activities (shipping, boating)
	AMAES-CAN-OP_ObjetivosOperativos	Other
	AMAES-CAN-MT-6_DadicionalesMamTortugas	Other
Monitoring programme	**submonitoring programme id**	**submonitoring programme name**
PC. Biodiversidad- Peces y cefalópodos D1, D4, D6 - biodiversity;fish and cephalopods,	AMAES-CAN-PC-1_PecesInfralitoralRocoso	Mobile species - abundance and/or biomass
	AMAES-CAN-PC-2_PecesPelagicos	Mobile species - abundance and/or biomass
	AMAES-CAN-PC-3_PecesCircaBatialRocoso	Mobile species - abundance and/or biomass
	AMAES-CAN-ACT-6_ActRecreativas	Activities extracting living resources (fisheries including recreational, maerl, seaweed)
	AMAES-CAN-ACT-1_PescaMaritima	Activities extracting living resources (fisheries including recreational, maerl, seaweed)
	AMAES-CAN-OP_ObjetivosOperativos	Other

Table 7 - Biodiversity monitoring programmes/sub-programmes - species

Monitoring programme	submonitoring programme id	submonitoring programme name
HB. Biodiversidad- Hábitats bentónicos D1, D4, D6 - biodiversity; benthic habitats.	AMAES-CAN-HB-1_InfralitRocoso	Seabed habitats - community characteristics
	AMAES-CAN-HB-2_InfralitSedim	Seabed habitats - community characteristics
	AMAES-CAN-HB-3_CircaBatRocoso	Seabed habitats - community characteristics
	AMAES-CAN-HB-6-BEN_EspeciesBentProteg	Benthic species - abundance and/or biomass
	AMAES-CAN-HB-5_Angiospermas	Seabed habitats - community characteristics
	AMAES-CAN-HB-8-InteraccionActHum	Physical disturbance - from bottom trawling
	AMAES-CAN-HB-9_DatosAdicionales	Other (additional information)
	AMAES-CAN-ACT-1_PescaMaritima	Physical disturbance - from bottom trawling
	AMAES-CAN-ACT-2_CablesTuberiasArrecifes	Physical loss - distribution and extent (from e.g. infrastructure, coastal protection)
	AMAES-CAN-ACT-4_ActPortuarias	Physical loss - distribution and extent (from e.g. infrastructure, coastal protection)
	AMAES-CAN-ACT-6_ActRecreativas	Coastal human activities (e.g. tourism, recreational sports, ecotourism)
	AMAES-CAN-ACT-7_DefensaCostera	Coastal human activities (e.g. tourism, recreational sports, ecotourism)
	AMAES-CAN-OP_ObjetivosOperativos	Other
Monitoring programme	**submonitoring programme id**	**submonitoring programme name**
HP. Biodiversidad- Hábitats pelágicos D1, D4, D6 - biodiversity; pelagic habitats	AMAES-CAN-HP-1_HabPelagicosCosteros	Pelagic habitats - community characteristics
	AMAES-CAN-HP-2_HabPelagicosPlataformOcean	Pelagic habitats - community characteristics
	AMAES-CAN-ACT-3_Acuicultura	Activities producing food (aquaculture)
	AMAES-CAN-PRES-3_CargasFuentesPuntuales	Contaminant inputs - land-based sources
	AMAES-CAN-CONT-5_PatogenosAgua	Microbial pathogen levels - in water column (bathing waters)
	AMAES-CAN-OP_ObjetivosOperativos	Other

Table 8 - Biodiversity monitoring programmes/sub-programmes - benthic & pelagic habitat

Monitoring programme	submonitoring programme id	submonitoring programme name
EAI. Especies alóctonas D2 - Non-indigenous species	AMAES-CAN-EAI-1_AreasSensiblesInvasoras	Non-indigenous species inputs - from specific sources
	AMAES-CAN-EAI-2_PuntosCalientesInvasoras	Non-indigenous species - abundance and/or biomass
	AMAES-CAN-EAI-3_EspecificoInvasoras	Non-indigenous species - abundance and/or biomass
	AMAES-CAN-EAI-4_RecopilacionDatosInvasoras	Non-indigenous species - abundance and/or biomass
	AMAES-CAN-EAI-5_DatosAdicionalesInvasoras	Other (additional information)
	AMAES-CAN-ACT-3_Acuicultura	Activities producing food (aquaculture)
	AMAES-CAN-ACT-5_Navegacion	Sea-based mobile activities (shipping, boating)
	AMAES-CAN-ACT-4_ActPortuarias	Activities with permanent infrastructures (e.g. renewable energy, oil & gas, ports) or structural ch
	AMAES-CAN-ACT-6_ActRecreativas	Coastal human activities (e.g. tourism, recreational sports, ecotourism)
	AMAES-CAN-OP_ObjetivosOperativos	Other

Table 9 - Non-indigenous species monitoring programmes/sub-programmes (QD2)

Monitoring programme	submonitoring programme id	submonitoring programme name
EC. Especies comerciales D3 - commercial fish species	AMAES-CAN-EC-1_EspeciesComerciales	Mobile species - mortality/injury rates from fisheries (targeted and/or incidental)
	AMAES-CAN-EC-2_DatosAdicionales	Other (additional information)
	AMAES-CAN-ACT-1_PescaMaritima	Activities extracting living resources (fisheries including recreational, maerl, seaweed)
	AMAES-CAN-OP_ObjetivosOperativos	Other

Table 10 - Commercial species monitoring programmes/sub-programmes (QD3)

Monitoring programme	submonitoring programme id	submonitoring programme name
EUT. Eutrofización D5 - Eutrophication	AMAES-CAN-EUT-1_AguasCosteras	Nutrient levels - in water column
	AMAES-CAN-EUT-2_AguasAbiertas	Nutrient levels - in water column
	AMAES-CAN-EUT-3_DatosAdicionales	Other (additional information)
	AMAES-CAN-HB-5_Angiospermas	Seabed habitats - community characteristics
	AMAES-CAN-AH-1_EscalaDemarcacion	Water column - hydrological characteristics
	AMAES-CAN-ACT-3_Acuicultura	Activities producing food (aquaculture)
	AMAES-CAN-OP_ObjetivosOperativos	Other
	AMAES-CAN-PRES-3_CargasFuentesPuntuales	Nutrient inputs - land-based sources

Table 11 - Eutrophication monitoring programmes/sub-programmes (QD5)

Monitoring programme	submonitoring programme id	submonitoring programme name
AH. Alteraciones hidrográficas D7 - Alteration of hydrographical conditions	AMAES-CAN-AH-1_EscalaDemarcacion	Water column - hydrological characteristics
	AMAES-CAN-AH-2_EscalaLocal	Water column - hydrological characteristics
	AMAES-CAN-HB-8_InteraccionActHum	Physical loss - distribution and extent (from e.g. infrastructure, coastal protection)
	AMAES-CAN-PRES-3_CargasFuentesPuntuales	Contaminant inputs - land-based sources
	AMAES-CAN-ACT-4_ActPortuarias	Activities with permanent infrastructures (e.g. renewable energy, oil & gas, ports) or structural ch
	AMAES-CAN-ACT-7_DefensaCostera	Activities with permanent infrastructures (e.g. renewable energy, oil & gas, ports) or structural ch
	AMAES-CAN-ACT-8_Hidrocarburos	Activities with permanent infrastructures (e.g. renewable energy, oil & gas, ports) or structural ch
	AMAES-CAN-OP_ObjetivosOperativos	Other

Table 12 - Alteration of hydrographical conditions monitoring programmes/sub-programmes (QD7)

Monitoring programme	submonitoring programme id	submonitoring programme name
CONT. Contaminantes D8 - Concentrations of contaminants	AMAES-CAN-CONT-1_AguasCosteras	Contaminant levels - in water/sediment
	AMAES-CAN-CONT-3_Radionucleidos	Contaminant levels - in water/sediment
	AMAES-CAN-CONT-4_ContaminacionAccidental	Contaminant inputs - sea-based acute events, incl. oil spills
	AMAES-CAN-CONT-5_PatogenosAgua	Microbial pathogen levels - in water column (bathing waters)
	AMAES-CAN-PRES-3_CargasFuentesPuntuales	Contaminant inputs - land-based sources
	AMAES-CAN-ACT-4_ActPortuarias	Activities with permanent infrastructures (e.g. renewable energy, oil & gas, ports) or structural ch
	AMAES-CAN-ACT-5_Navegacion	Sea-based mobile activities (shipping, boating)
	AMAES-CAN-ACT-8_Hidrocarburos	Activities with permanent infrastructures (e.g. renewable energy, oil & gas, ports) or structural ch
	AMAES-CAN-OP_ObjetivosOperativos	Other
Monitoring programme	**submonitoring programme id**	**submonitoring programme name**
CP. Contaminantes en el pescado D9 - Contaminants in seafood	AMAES-CAN-CP-1_ContaminantesPescado	Contaminant levels - in species, including seafood
	AMAES-CAN-CP-2_PatogenosPescado	Microbial pathogen levels - in biota (seafood)
	AMAES-CAN-PRES-3_CargasFuentesPuntuales	Contaminant inputs - land-based sources
	AMAES-CAN-ACT-1_PescaMaritima	Activities extracting living resources (fisheries including recreational, maerl, seaweed)
	AMAES-CAN-CONT-1_ContAguasCosteras	Contaminant levels - in water/sediment
	AMAES-CAN-CONT-2_ContAguasAbiertas	Contaminant levels - in water/sediment
	AMAES-CAN-CONT-4_ContaminacionAccidental	Contaminant inputs - sea-based acute events, incl. oil spills
	AMAES-CAN-CONT-5_PatogenosAgua	Microbial pathogen levels - in water column (bathing waters)
	AMAES-CAN-OP_ObjetivosOperativos	Other

Table 13 - Concentrations of contaminants monitoring programmes/sub-programmes (QD8) and concentrations of contaminants in seafood monitoring programmes/sub-programmes (QD9)

Monitoring programme	submonitoring programme id	submonitoring programme name
BM. Basuras marinas D10 - Marine litter	AMAES-CAN-BM-1_OSPAR_BasurasPlayas	Litter - characteristics and abundance/volume
	AMAES-CAN-BM-2_BasuraFlotante	Litter - characteristics and abundance/volume
	AMAES-CAN-BM-3_BasuraFondoMarino	Litter - characteristics and abundance/volume
	AMAES-CAN-BM-4_MicroparticulasAgua	Litter microparticles - abundance/volume
	AMAES-CAN-BM-5_MicroparticulasFondo	Litter microparticles - abundance/volume
	AMAES-CAN-BM-6_MicroplasticosPlayas	Litter microparticles - abundance/volume
	AMAES-CAN-BM-7_DatosAdicionales	Other (additional information)
	AMAES-CAN-AV-5_DatosAdicionales	Other (additional information)
	AMAES-CAN-MT-5_Varamientos	Mobile species - health status
	AMAES-CAN-PRES-3_CargasFuentesPuntuales	Contaminant inputs - land-based sources
	AMAES-CAN-ACT-1_PescaMaritima	Activities extracting living resources (fisheries including recreational, maerl, seaweed)
	AMAES-CAN-ACT-5_Navegacion	Sea-based mobile activities (shipping, boating)
	AMAES-CAN-OP_ObjetivosOperativos	Other

Table 14 - Marine litter monitoring programmes/sub-programmes (QD10)

Monitoring programme	submonitoring programme id	submonitoring programme name
RS. Ruido submarino D11 - Underwater noise	AMAES-CAN-RS-1_RuidoImpulsivo	Acute underwater noise - distribution, frequency and levels
	AMAES-CAN-RS-2_RuidoAmbiente	Diffuse underwater noise - distribution, frequency and levels
	AMAES-CAN-ACT-5_Navegacion	Sea-based mobile activities (shipping, boating)
	AMAES-CAN-ACT-8_Hidrocarburos	Activities with permanent infrastructures (e.g. renewable energy, oil & gas, ports) or structural ch
	AMAES-CAN-OP_ObjetivosOperativos	Other

Table 15 - Underwater noise monitoring programmes/sub-programmes (QD10)

V. Programmes of measures

5 MSFD programmes of measures, including establishment of marine protected areas, and exceptions

Member States shall, in respect of each marine region or sub-region concerned, identify the measures which need to be taken in order to achieve or maintain good environmental status in their marine waters, including spatial protection measures, contributing to coherent and representative networks of marine protected areas. Within the present obligation, they also have to report on the exceptions where environmental targets or good environmental status cannot be achieved by 2020.
Reporting on Programmes of Measures was scheduled for end of 2015 and reporting envelope includes five folders:

1. National text based reports - (last update 25/03/2017);
2. Three sub-collection folders for each Marine region and/or sub-region with uploaded tabular data - data provided following xml schemas - (last update 21/09/2016 for Macaronesia);
3. Geographical data (updated MSFD4Geo.xml and GIS data) - This folder is empty

Reporting folder is available:
http://cdr.eionet.europa.eu/es/eu/msfd_pom/

5.1 National text based report

Document “VII PdM Resumen” includes general information on the reporting on PoM. It describes the whole implementation MSFD process, including the roadmap, that finalize with programme of measures and marine strategy for each Spanish sub- region.

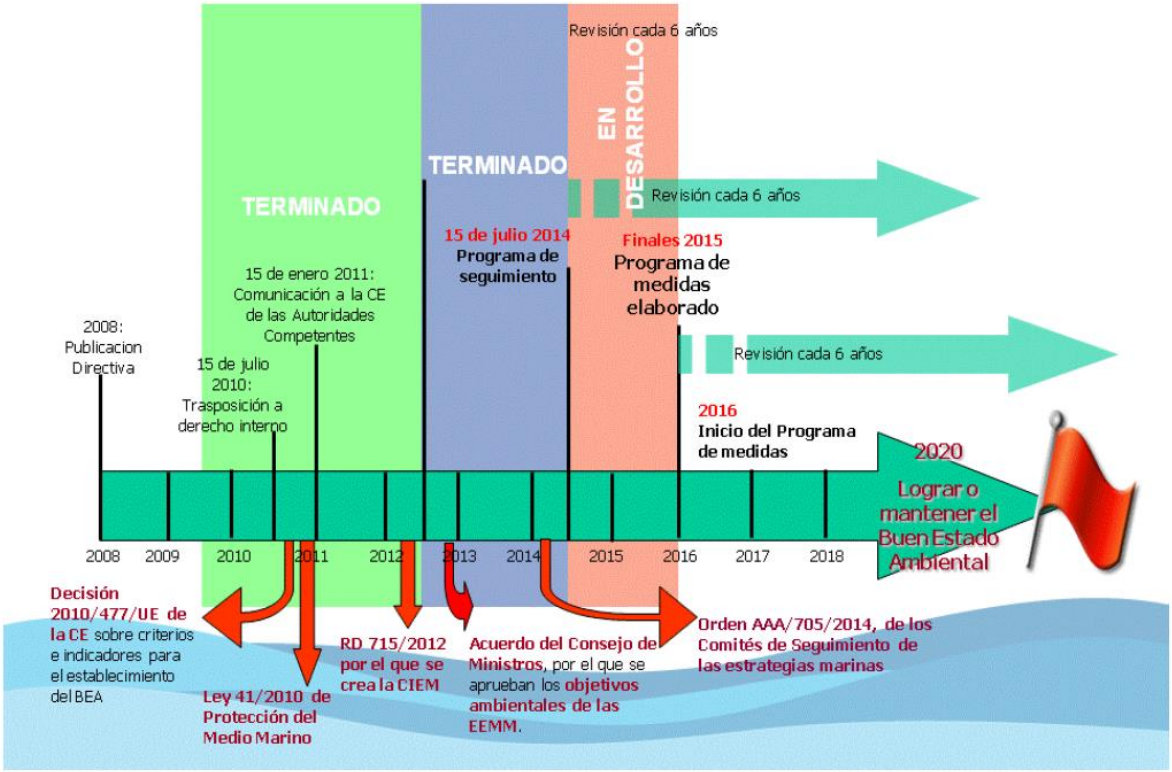

Figure 11 - Calendar and current status (2016) of MSFD implementation in Spain. Figure included in the Spanish national PoM report.

Development of the PoM is conditioned by initial assessment and phase of establishing environmental targets for reaching or preserving GES. PoM contains, already operational measures and new measures. Already operational measures were established in the frame of other policies, research and development, that apply on the coastal and marine waters environment. New measures will be applied in the frame of MSFD, developed for obtaining and preserving GES.

Within this reporting is established the Database of measures, including already operational measures and new/proposed measures. For each measure, new or already operational, is necessary to provide Key Type of Measure (KTM).
In the scope of the WFD and river basement management plans (2015-2021) are defined 25 KTM’s, and 20 of them are relevant for sea/ocean environment. Common start MSFD working group defined next 14 KTMs, related to the maritime activities (Table 16).

N°	Additional KTMs for MSFD reporting
26	Measures to reduce physical loss[1] of seabed habitats in marine waters (and not reported under KTM 6 in relation to WFD Coastal Waters)
27	Measures to reduce physical damage[2] in marine waters (and not reported under KTM 6 in relation to WFD Coastal Waters)
28	Measures to reduce inputs of energy, including underwater noise, to the marine environment
29	Measures to reduce litter in the marine environment
30	Measures to reduce interferences with hydrological processes in the marine environment (and not reported under KTM 6 in relation to WFD Coastal Waters)
31	Measures to reduce contamination by hazardous substances (synthetic substances, non-synthetic substances, radio-nuclides) and the systematic and/or intentional release of substances in the marine environment from sea-based or air-based sources
32	Measures to reduce sea-based accidental pollution
33	Measures to reduce nutrient and organic matter inputs to the marine environment from sea-based or air-based sources
34	Measures to reduce the introduction and spread of non-indigenous species in the marine environment and for their control
35	Measures to reduce biological disturbances in the marine environment from the extraction of species, including incidental non-target catches
36	Measures to reduce other types of biological disturbance, including death, injury, disturbance, translocation of native marine species, the introduction of microbial pathogens and the introduction of genetically-modified individuals of marine species (e.g. from aquaculture)
37	Measures to restore and conserve marine ecosystems, including habitats and species
38	Measures related to Spatial Protection Measures for the marine environment (not reported under another KTM)
39	Other measures

Table 16 - 14 KTM defined for the marine areas in relation to the maritime activities (Source DIKE_10-2014-03)

New measures were established within expert workshops, technical working group on national and European level and analysis-discussion-validation process with sub-regional authorities/administrations. Before adapting the proposed PoM as a part of the Marine Strategies were delivered cost-efficiency analysis and SEA for “new” measures. It is elaborated regional coordination for implementing PoM, within focus on RSC’s and for Canarias through bilateral meeting Spain-Portugal. Before adapting the marine strategies for Spain, PoM were put during 2015/2016 for the public consultation.

List of new measures is available as annex in summary document for PoM and marine strategy:
http://cdr.eionet.europa.eu/es/eu/msfd_pom/msfd4text/envv_tg9a/VII_PdM_Resumen_post.pdf

Number of measures included in Spanish PoM			
Thematic	N of new measures	N of opertive measures	N of measures
Biodiversity (QD1, QD4 & QD6)	25	24	49
Marine Protected Areas	12	5	17
Non-indigenous species (QD2)	3	0	3
Commercial fish species (QD3)	9	1	10
Eutrophication, contaminants and Contaminants in seafood (QD5, QD8 & QD9)	10	4	14
Alteration of hydrographical conditions (QD7)	1	0	1
Marine litter (QD10)	26	3	29
Marine noise (QD11)	1	0	1
Horizontal thematics	10	4	14
Total	**97**	**41**	**138**

Table 17- Number of proposed measures (new & already operative) in relation to the QD's, establishing MPA and horizontal thematics.

5.2 Tabular data

Tabular data on Programme of Measures (PoM) for Canarias is provided as structured XML file, including information per each measure:
UniqcodeID; name, KTM, relevant environmental target(s), relevant descriptor(s), relevant feature from MSFD Annex III, spatial geographic zones type, link to existing policies. It is available:
http://cdr.eionet.europa.eu/es/eu/msfd_pom/amaes/envv_i6a/AMA-ES-SD-CAN_def.xml

Analyzing the XML file, for the Canaries 249 measures are reported, related to 26 different KTM's. 12 KTM's were "new" in the scope MSFD and 14 established within the scope of WFD:

- Biodiversity is addressed by 30 measures for restoring/conserving marine ecosystems (including habitats and species); 24 measures to reduce biological disturbances in the marine environment; 5 measures to reduce other types of biological disturbance (death, injury, disturbance, translocation of native marine species, the introduction of microbial pathogens and the introduction of genetically-modified individuals) and 3 measures to address physical loss of seabed habitats. In total 63 measures related to the biodiversity, species and habitats.
- 48 measures are addressing marine litter issues, including applying new regulations, developing best practices guides, national plans for recycling, direct measures related to use of plastic bags, etc...
- 26 measures related to Spatial Protection Measures - including the MPA's as national parks, Network of Natura 2000, marine reserves etc. These measures include management and regulation, as well as the establishment of new Spanish MPA's
- 22 measures are focused to the research and improvement of knowledge base - related to the habitats and species, environmental - marine data management,

sustainable technologies development, knowledge on marine environmental pressures and impacts

- 18 measures to prevent or control the adverse impacts of fishing, including fishery regulations and controls
- 12 measures to reduce sea-based accidental pollution including development of the national plan against sea contamination, shipping security and safety measures. 10 additional measures are related to the contamination by hazardous substances, mainly as applying international and national regulations.
- 7 measures to reduce the introduction and spread of non-indigenous species + measure to prevent or control the adverse impacts of invasive alien species. This measures are referring on international conventions and national regulations, including development of the early alert system.
- Measures related to impact of wastewater plants, recreational activities, angling, agriculture,
- Etc..

Sheets on Existing measures include information Code, title, brief description, type of action, category, related descriptor and responsible authority.
Annex 13 includes descriptive sheets on the "new" measures and include more detailed information on measures proposed.
These sheets are available as Annex 4 to Annex 12, in compressed file "VII_PdM_Anexos_Post.zip":
http://cdr.eionet.europa.eu/es/eu/msfd_pom/msfd4text/envv_tg9a/VII_PdM_Anexos_Post.zip

PoM includes measures that applies to maritime sectors such as aquaculture, transport and energy, with a goal to reduce their impacts on marine environment. Measures that apply on blue growth sectors should be analyzed in detail within the PLASMAR project, action 2.1.1c on *Finding the balance of Blue Growth sustainable development within Ecosystem approach* where solutions on sustainability need to be defined.

Number of measures	KTM (MSFD/WFD)	Title/brief description
48	ktmMSFD29	Measures to address marine littler
30	ktmMSFD37	Measures to restore and conserve marine ecosystems, including habitats and species
26	ktmMSFD38	Measures related to Spatial Protection Measures for the marine environment (not reported under another KTM)
24	ktmMSFD35	Measures to reduce biological disturbances in the marine environment from the extraction of species, including incidental non-target catches
22	ktmWFD14	Research, improvement of knowledge base reducing uncertainty.
21	ktmMSFD39	Other measures
18	ktmWFD20	Measures to prevent or control the adverse impacts of fishing and other exploitation/removal of animal and plants
12	ktmMSFD32	Measures to reduce sea-based accidental pollution
9	ktmWFD99	Measures to counteract acidification
7	ktmMSFD34	Measures to reduce the introduction and spread of non-indigenous species in the marine environment and for their control
5	ktmMSFD31	Measures to address contamination by hazardous substances (synthetic substances, non-synthetic substances, radio-nuclides) and the systematic and/or intentional release of substances in the marine environment from sea-based or air-based sources
5	ktmMSFD36	Measures to reduce other types of biological disturbance, including death, injury, disturbance, translocation of native marine species, the introduction of microbial pathogens and the introduction of genetically-modified individuals of marine species (e.g. from aquaculture)
5	ktmWFD15	Measures for the phasing-out of emissions, discharges and losses of priority hazardous substances or for the reduction of emissions, discharges and losses of priority substances.
4	ktmMSFD28	Measures to address inputs of energy to the marine environment, including underwater noise
4	ktmWFD06	Improving hydromorphological conditions of water bodies other than longitudinal continuity (e.g. river restoration, improvement of riparian areas, removal of hard embankments, reconnecting rivers to floodplains, improvement of hydromorphological condition of transitional waters, etc.).
3	ktmMSFD26	Measures to address physical loss of seabed habitats in the marine environment
3	ktmMSFD30	Measures to address interferences with hydrological processes in the marine environment
3	ktmWFD01	Construction or upgrades of wastewater treatment plants
3	ktmWFD19	Measures to prevent or control the adverse impacts of recreation including angling
1	ktmWFD02	Reduce nutrient pollution from agriculture
1	ktmWFD12	Advisory services for agriculture
1	ktmWFD13	Drinking water protection measures (e.g. establishment of safeguard zones, buffer zones etc.)
1	ktmWFD17	Measures to reduce sediment from soil erosion and surface run-off
1	ktmWFD18	Measures to prevent or control the adverse impacts of invasive alien species and introduced diseases
1	ktmWFD21	Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure
1	ktmWFD24	Adaptation to climate change

Table 18 - Number of measures linked to KTM included in PoM of Canarias

References

MINISTERIO DE AGRICULTURA, ALIMENTACIÓN Y MEDIOAMBIENTE (DIVISIÓN PARA LA PROTECCIÓN DEL MAR);

INSTITUTO ESPAÑOL DE OCEANOGRAFÍA;

CEPYC-CEDEX:

Estrategias marinas: Evaluación inicial, buen estado ambiental y objetivos ambientales. Documentos generales (2012)

- Estrategias marinas: documento marco. Evaluación inicial, buen estado ambiental y objetivos ambientales.
- Evaluación inicial y buen estado ambiental del Grupo Aves para las Estrategias Marinas. Documento general y demarcaciones marinas
- Evaluación inicial y buen estado ambiental del Grupo Mamíferos Marinos para las Estrategias Marinas. Documento general y demarcaciones marinas

Estrategia marina para la demarcación canaria

- Parte I. Marco general: características de la demarcación marina
- Parte II. Análisis de presiones e impactos
- Parte III. Análisis económico y social
- Parte IV. Descriptores del buen estado ambiental - Descriptor 1. Biodiversidad
- Parte IV. Descriptores del buen estado ambiental - Descriptor 2. Especies alóctonas
- Parte IV. Descriptores del buen estado ambiental - Descriptor 3. Especies marinas explotadas comercialmente
- Parte IV. Descriptores del buen estado ambiental - Descriptor 4. Redes tróficas
- Parte IV. Descriptores del buen estado ambiental - Descriptor 5. Eutrofización
- Parte IV. Descriptores del buen estado ambiental - Descriptor 6. Fondos marinos
- Parte IV. Descriptores del buen estado ambiental - Descriptor 7. Condiciones hidrográficas
- Parte IV. Descriptores del buen estado ambiental - Descriptor 8. Contaminación y sus efectos
- Parte IV. Descriptores del buen estado ambiental - Descriptor 9. Contaminantes en los productos de la pesca
- Parte IV. Descriptores del buen estado ambiental - Descriptor 10. Basuras marinas
- Parte IV. Descriptores del buen estado ambiental - Descriptor 11. Ruido
- Parte V. Establecimiento de objetivos ambientales
- Parte VI.3. Subprogramas de Seguimiento de la demarcación canaria

Programas de seguimiento de las estrategias marinas

- VI. Memoria programas seguimiento
- VI.1. Anexo Fichas Indicadores
- VI.2. Anexos 1,2 y 3
- VI.2. Anexo4 Fichas 01-50
- VI.2. Anexo4 Fichas 051-100
- VI.2. Anexo4 Fichas 101-150
- VI.2. Anexo4 Fichas 151-200

- VI.2. Anexo4 Fichas 201-250
- VI.2. Anexo4 Fichas 251-300
- VI.2. Anexo4 Fichas 300-317

Programas de medidas de las estrategias marinas

- Documento inicial estratégico
- Documento de alcance
- Estudio ambiental estratégico. Memoria
- Estudio ambiental estratégico. Anexos
- Informe de alegaciones
- VII. Programas de medidas. Memoria
- VII. Programas de medidas. Anexos
- VII. Programas de medidas. Resumen técnico