

OCEAN SATELLITE ACCOUNT 2016-2017

INTRODUCTION

The Regional Directorate of Statistics of Madeira (DREM) releases today – the National Day of the Sea – for the first time, the Ocean Satellite Account for the Autonomous Region of Madeira (OSA-RAM), regarding the years of 2016 and 2017.

This release is made simultaneously with Statistics Portugal (INE) which provides the OSA for the country (including data for the two Autonomous Regions) and with the Statistics Regional Service of the Azores (SREA) which also publishes the OSA for their respective Autonomous Region. This edition of the OSA was developed by Statistics Portugal - in partnership with the Directorate-General for Maritime Policy (DGPM) - and in close cooperation with DREM and SREA, which gathered a significant amount of regional information and analysed the methodological aspects, with regional impact, and the pre-publication results, in cooperation with Statistics Portugal.

The OSA is a pioneer project of Statistics Portugal, whose first edition was released in early June of 2016 for the years 2010-2013, but only with results for the country. Taking into account the context of the Region - which is strongly linked to the sea by natural circumstances - it was considered important to regionalise this project, having DREM been one of the organisations that expressed this intention to Statistics Portugal. The OSA-RAM is finally available, and it is expected to continue to be developed in the future, along the same lines, i.e., with Statistics Portugal coordinating the work involving the regional statistical authorities of Madeira and Azores.

From now on, the Autonomous Region of Madeira has a unique assessment tool concerning the importance of activities related to the Ocean Economy. In fact, the Portuguese autonomous regions are the first in Europe (and probably in the World) to have the OSA, with the advantage of being official statistics, that is, carried out within the scope of the statistical activity program of National Statistical System. It should be noted that even at European level, Portugal is the only country with this tool.



It should also be underlined that the results of OSA-RAM/2016-2017 are consistent with the Regional Accounts (base 2016), and the choice of the years 2016 and 2017 resulted from the fact that these were the last years for which there is available definitive information.

1. WHAT IS THE OCEAN SATELLITE ACCOUNT?

The Satellite Accounts aim to expand the observation capacity of particular phenomena, constituting, in the case of the Autonomous Regions, extensions of Regional Accounts (RA). As it is known, according to the stipulated in the most recent European System of Accounts (SEC-2010), the information set for Regional Accounts is much scarcer than for National Accounts, allowing the calculation of Gross Domestic Product (GDP) only through one of the three known approaches, the one relative to production. Consequently, the indicators available in a regional OSA, due to methodological constraints, are also fewer than in the national OSA, not having, for example, analysis by products or regarding exports and imports, since at the regional level is only available information about international trade, which represents a very small share of all the trade of the Region, most of which is carried out with the mainland.

In particular, OSA aims to measure the size and the importance of Ocean Economy in the national (or regional) economy and also can be used to support the decision on coordination process of the public policies related to the ocean, providing information on the production structure of related activities. Although for the above reasons, it is not possible for the Autonomous Region of Madeira to have the OSA with the same set of information as for the country, it is nevertheless possible to have the most important indicators - the contribution of the "Ocean" to Gross Value Added (GVA) and regional employment.

OSA also has as main methodological references the study made to Eurostat, in 2009: Ifremer et al., "*Study in the field of maritime policy - Approach towards an Integrated Maritime Policy Database*" and the work done and in progress, since 2012, by European Commission (EC) / Directorate-General for Maritime Affairs and Fisheries (DG MARE), in the Blue Growth scope: *Blue growth*". The second edition of OSA was also based on the Methodological Report produced by Statistics Portugal and DGPM, in 2016: "*Satellite Account for the Sea – 2010-2013. Methodological Report*".

The economic activities that take place at sea are, for example, maritime transport, fisheries and marine aquaculture, research and exploitation of non-living marine resources, nautical tourism, marine equipment operation and services, namely information services and maritime communication. The remaining activities, which do not operate or depend on the ocean, correspond to the rest of the economy.

The definition of Ocean Economy takes into account the economic activities that use the ocean, directly or indirectly, privileging the value chain in which they operate, covering both activities that are located in the



maritime space, as well as others located in coastal areas and also in remote areas from the coast, as long as they are related to the “Ocean”.

The activities or goods and services related to the Ocean Economy are fundamentally identified as those who meet simultaneously the following conditions:

1. Activities and / or goods and services that, in the absence of the ocean, would cease to exist in significant quantities, or their consumption would be significantly reduced;
2. Existence of statistical information available or that can be obtained.

The concept of Ocean Economy, considered in the OSA, aggregates activities in two main areas: “Established activities” and “Emerging activities” which, in turn, are divided into groups. Were considered 9 groups, 8 of which correspond to established activities (groups 1 to 8) and the last group 9 - *New uses and resources of the ocean*, which congregates the emerging activities. However, the low number of units in groups 2 - Non-living marine resources, 6 - Maritime equipment and 9 - New uses and resources of the ocean, prevented, in the case of the Autonomous Regions, the dissemination of information related to these groups.

The compilation of information on tourism within the scope of the OSA, which includes hotels and similar establishments, restaurants and similar services, travel agency services, tour operators and other reserves services and related activities, was particularly complex and relies on the classification of parishes as coastal areas according to the distance to the sea. For a matter of methodological coherence, the criterion used for Madeira was the same the one used in the Mainland and Azores. Thus, the parish is considered coastal area if it is by sea or if it has 50% of its surface to 10 km away from the sea. The application of this criterion makes that all the parishes of Madeira are considered coastal area, the same happening with Azores. However, there was no “blind” application of this criterion, because in addition of being complemented with component motivation, tourist entities dedicated to other activities, not related to the sea, were also left out whenever identified.

In the case of Employment, in comparison with national values, data were presented for the first time for the Region, making available Employment expressed in full-time equivalent (FTE). FTE is the number of jobs equivalent to full-time and is defined as the result of the total hours worked divided by the annual average hours worked in full-time jobs, in the economic territory.

For further information on methodology, particularly on the details of each group, the methodological notes should be consulted at the end of this "Em Foco".



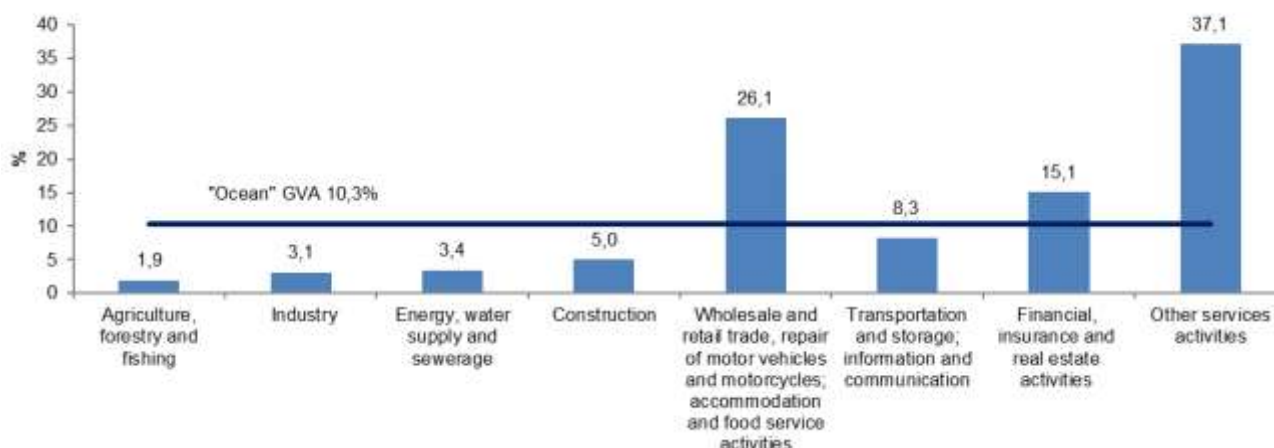
2. MAIN RESULTS

2.1 Comparison with regional economy

The ocean economy (mentioned in this “Em Foco” as “Ocean”, for simplification purposes) represented 10.3% of the regional Gross Value Added (GVA), 9.4% of the employment and 10.8% of the compensation of employees in the 2016-2017 biennium. Between 2016 and 2017 the “Ocean” GVA increased by 18.2%, while the regional GVA increased only by 6.7%. The share of regional in the national “Ocean” GVA was 6.8% in 2017, higher when compared to the total GVA, in which this proportion was of 2.5%. “Ocean” GVA of Madeira reached 453.1 million euros in 2017.

If analysed the relative importance of the “Ocean” GVA, it can be seen that in the 2016-2017 biennium, the dimension was higher than other types of industries such as “Construction” (5.0%) and “Transport and storage; Information and communication activities” (8.3%).

**Figure 1 – Distribution of the regional GVA by industries vs” Ocean” GVA
(average 2016-2017)**



Between 2016 and 2017, employment grew by 12.8%, while in the whole economy this growth was 4.2%. In 2017, the share of regional “Ocean” employment in the national market reached 5.9%, while in terms of total employment this proportion was only 2.5%. Total employment in full-time equivalent (FTE) for 2017 was 11 135.

Regarding the compensation of employees, it went up by 14.8% between 2016 and 2017, substantially above the national economy, in which this change did not exceed 5.0%. In 2017, the share of regional “Ocean” compensation of employees in the country was 5.7%, a proportion above the one observed for the



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total compensation of employees, which did not exceed 2.3%. The value of the “Ocean” compensation of employees in 2017 reached 222.1 million euros.

Table 1 – Main results of OSA-RAM, with reference to the regional economy

Year	2016			2017			Change rate OSA-RAM 2016-2017 (%)	Change rate in Regional Economy 2016-2017 (%)
	OSA - RAM	Regional Economy	OSA - RAM / Regional Economy	OSA - RAM	Regional Economy	OSA - RAM / Regional Economy		
GVA (€ million)	383,2	3 922,0	9,8	453,1	4 183,3	10,8	18,2	6,7
Employment (FTE)	9 868	109 554	9,0	11 135	114 172	9,8	12,8	4,2
Employees (FTE) (No.)	8 569	91 106	9,4	9 585	96 167	10,0	11,9	5,6
GVA / FTE (€ thousand)	38,8	35,8	108,5	40,7	36,6	111,1	4,8	2,3
Compensation of employees (€ million)	193,5	1 874,3	10,3	222,1	1 967,8	11,3	14,8	5,0
Average compensation of employees (€ thousand)	22,6	20,6	109,8	23,2	20,5	113,2	2,6	-0,5
Compensation of employees / GVA (%)	50,5	47,8	105,7	49,0	47,0	104,2	-1,5 p.p.	-0,8 p.p.

2.2 By observation levels

The OSA activities can be broke down into 3 types: characteristic activities such as fishing and aquaculture, ship repair, port activity, maritime transports, coastal works, nautical, etc ...; cross-cutting activities (maritime equipment and services) and activities favoured by the proximity to the sea, that is, activities associated with coastal tourism.

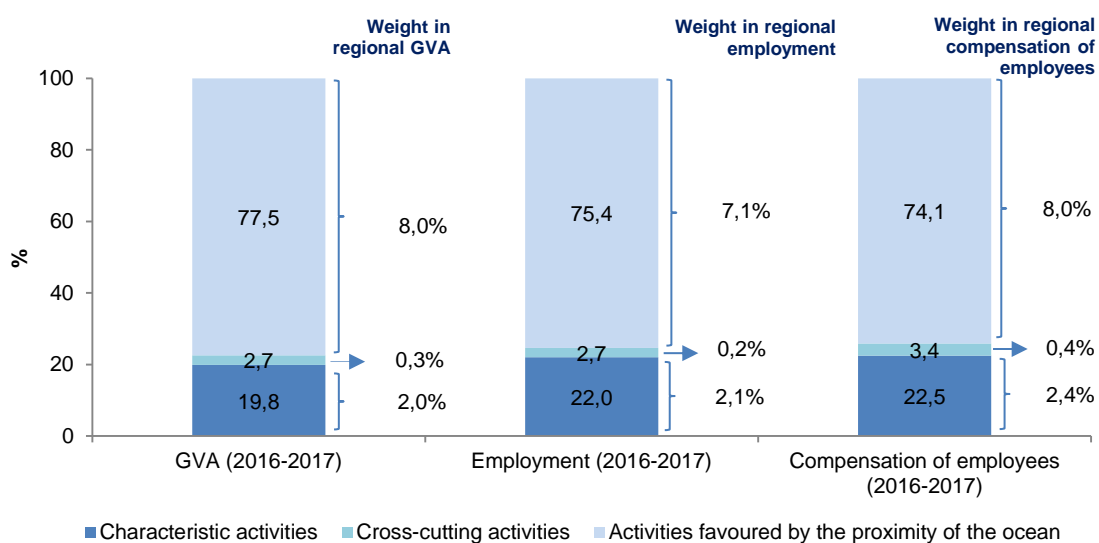
The first - characteristic activities – accounted for 19.8% of “Ocean” GVA and 22.0% of “Ocean” Employment in the 2016-2017 biennium. At country level, these shares were substantially higher, 45.8% and 51.2% respectively. Please note that in the case of GVA this national ratio refers to the 2016-2018 triennium.

The second - cross-cutting activities - were responsible for only 2.7% of “Ocean” GVA and Employment, significantly below the national proportions for these activities, 13.8% and 12.6%, by the same order.

The third - favoured by the proximity to the sea - is the most important in the context of OSA, due to the share that Tourism has in the economy of the Autonomous Region of Madeira. Thus, these activities represent 77.5% of “Ocean” GVA and 75.4% of “Ocean” Employment. These proportions are almost twice higher of those observed at national level, which does not exceed 40.4% and 36.2%, respectively. However, even in the country as a whole and by comparison with the previous OSA (2013), there was a growth of 14.3 percentage points (pp) of the activities favoured by the proximity of the sea in the “Ocean” GVA and 9.0 pp in the case of “Ocean” Employment, which is justified by the growth of tourist activity at national level.



Figure 2 – “Ocean” GVA, employment and compensation of employees, by observation levels



2.3 By groups

As mentioned above, the “Ocean” activities are divided into nine groups, of which, for reasons of confidentiality principle, results can only be presented for six of them. This situation is due to the reduced number of active units in groups 2 - Non-living marine resources, 6 - Marine equipment and 9 - New uses and resources of the sea.

Table 2 – Key indicators, by group

Group	Kind of activity units 2016-2017	GVA 2016-2017	Employment 2016-2017
	No.	(€ million)	FTE
1. Fisheries, aquaculture, processing, wholesale and retail of its products	132	37,7	1 147
2. Non-living marine resources	3
3. Ports, transports and logistics	48	43,1	505
4. Recreation, sports, culture and tourism	3 281	321,1	8 337
5. Shipbuilding, maintenance and repair	13	0,4	33
6. Maritime equipment	2
7. Infrastructures and maritime works	21	3,9	176
8. Maritime services	85	11,3	280
9. New uses and resources of the ocean	4
OSA - RAM	3 586	418,2	10 502
Regional Economy	x	4 052,7	111 863
OSA - RAM / Regional Economy	x	10,3%	9,4%



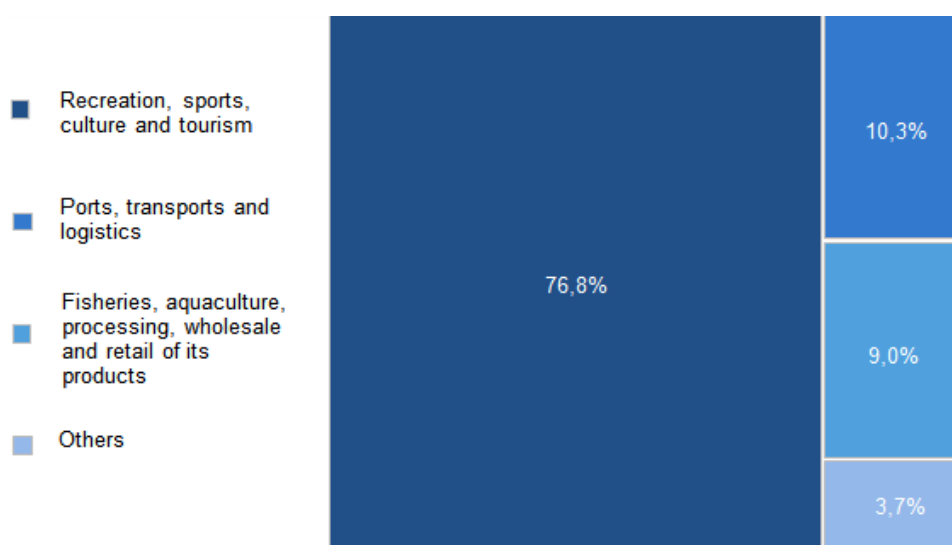
2.3.1 Units of local economic activity

In the scope of the OSA-RAM were identified, in 2017, more than 4 thousand units with “Ocean” activities, totally or partially. The group 4 – Recreation, sports, culture and tourism, accounted for 91.5% of the total units of local economic activity, in average terms, for the period 2016-2017, a percentage higher than the one observed for Portugal (75.1%), which is explained by a specialisation of the economy of the Autonomous Region of Madeira in Tourism. As in the case of national level, group 1 - Fisheries, aquaculture, processing and retail of its products ranks second, with 3.7% of the units.

2.3.2 Gross Value Added (GVA)

In the 2016-2017 period, group 4 – Recreation, sport, culture and tourism was also the most relevant in what concerns GVA, representing more than three quarters (76.8%) of the “Ocean” GVA. It was followed by groups 3 – Ports, transport and logistic and 1 - Fisheries, aquaculture, processing and retail of its products, with 10.3% and 9.0% respectively.

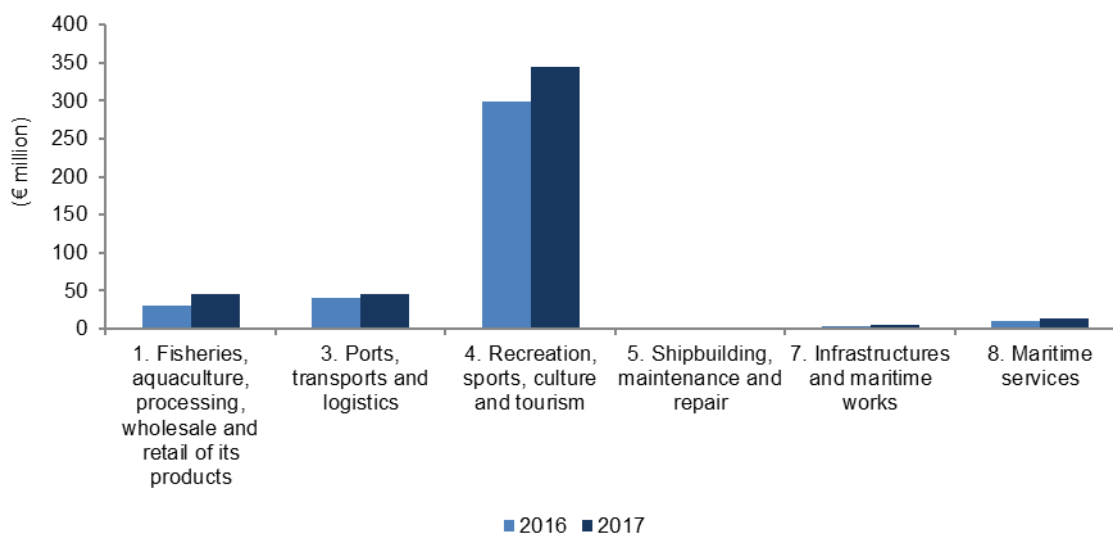
Figure 3 – Distribution of “Ocean” GVA in Autonomous Region of Madeira, by group (average 2016-2017)



The growth of GVA between 2016 and 2017 in groups 1 and 4, was of 47.7% and 15.4% respectively, reflecting the pronounced increase of unloaded fishing and the positive evolution of tourism activity in 2017.



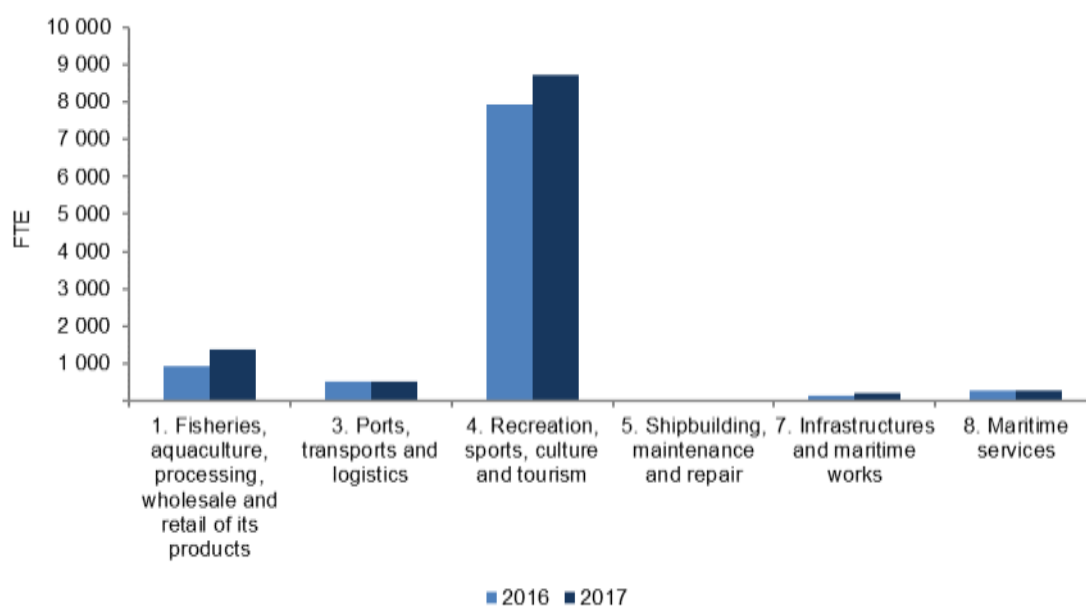
Figure 4 – Evolution of “Ocean” GVA, by group, 2016-2017



2.3.3. Employment and compensation of employees

In the case of employment, is observed a similar hierarchy of the groups as in GVA. In fact, considering the average of the 2016-2017 period, group 4 – Recreation, sport, culture and tourism, accounts for almost 80% of “Ocean” Employment (8.3 thousand FTE), a percentage twice higher than the one at national level. It is followed by group 1 - Fisheries, aquaculture, processing and marketing of its products, which represents 10.9% of “Ocean” Employment (1.1 thousand FTE).

Figure 5 – Distribution of “Ocean” Employment, in FTE, by group



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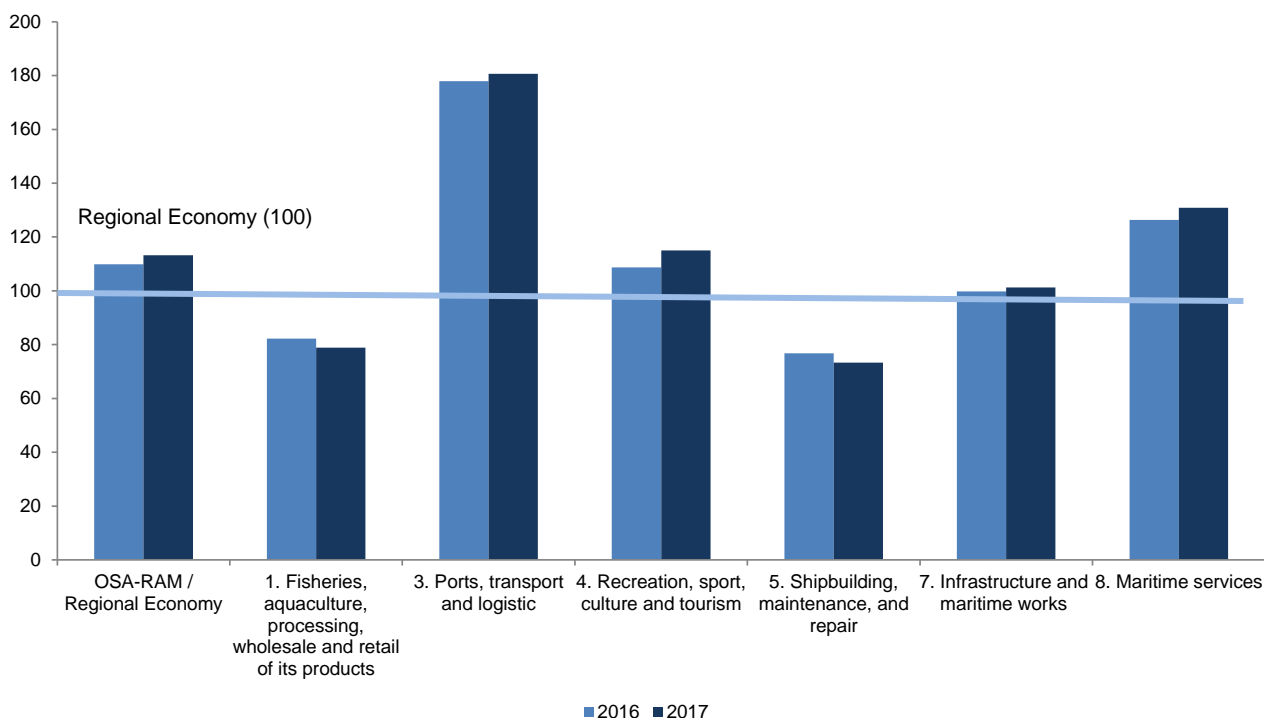
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Regarding the compensation of employees in 2016-2017, group 4 – Recreation, sport, culture and tourism stands out from the others with 78.1% of the “Ocean” compensation of employees. It is followed by groups 1 – Fisheries, aquaculture, wholesale and retail of its products and 3 – Ports, transports and logistics, with 8.7% and 7.7% of the total “Ocean” compensation of employees, respectively.

The average compensation of employees per FTE showed a significant dispersion, as figure 6 shows, with group 3 - Ports, transports and logistics, standing out, followed by group 8 – Maritime services, which, at the national level, leads this indicator. At the opposite extreme are groups 5 – Shipbuilding, maintenance, and repair and 1 – Fisheries, aquaculture, processing and wholesale and retail on its products. This dispersion – which is also visible in the case of the country - may reflect, among other factors, the heterogeneity of human resources qualifications associated with different groups.

Figure 6 – Average Compensation of employees by FTE, by group (regional economy=100)



3. RESULTS COMPARISON

Until now, Portugal is the only European country with OSA and its autonomous regions also are the only regions in which this tool is available. There are, however, some estimates on the value of the ocean economy at the global and regional level, as well as several isolated studies carried out by some countries, which attempt to quantify the relative importance of the ocean economy (in terms of GVA / GDP and employment).



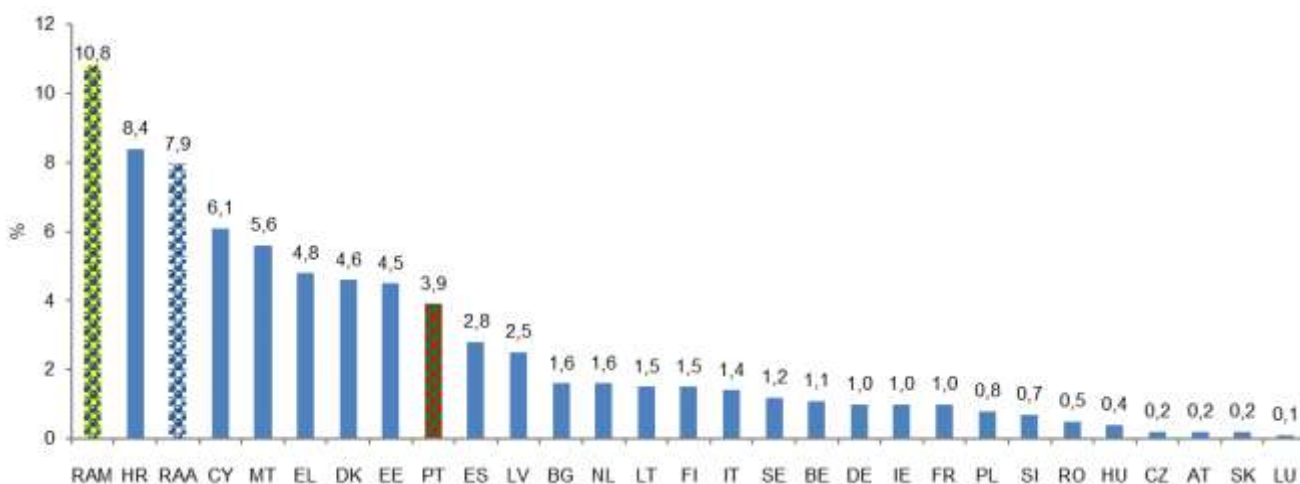
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In this section of “Em Foco”, some comparisons were made, namely with the country, with the Autonomous Region of the Azores and with other EU countries. For the data related to EU countries, the figures used were the same presented by the European Commission in the document “The EU Blue Economy Report 2020”. However, comparisons should be viewed with some care. Although being regions, the Autonomous Regions’ values have also been added to the graphs below for comparison.

Autonomous Region of Madeira when compared with different countries from EU, with Portugal (3.9%) and with the Autonomous Region of Azores (7.9%), is the one with the higher share of the “Ocean” GVA in total GVA (10.8%) in 2017. Among the EU countries, Croatia, Cyprus and Malta led in this indicator, with Portugal in 7th place.

Figure 7 – Share of GVA Ocean Economy in national/regional economy (2017)

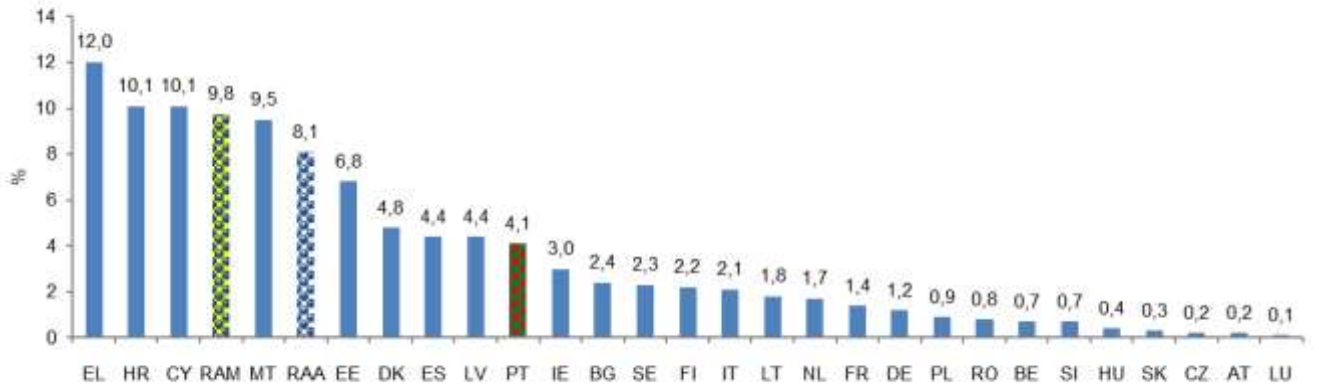


Source: OSA (PT/RAA/RAM) and THE EU BLUE ECONOMY REPORT 2020 (others MS)

Regarding the share of “Ocean” Employment in the total of Employment in 2017, the Autonomous Region of Madeira (9.8%) comes after Greece, Croatia and Cyprus and immediately ahead of Malta and the Autonomous Region of the Azores (8.1%). Portugal (4.1%), among the EU countries, comes in 9th place.



Figure 8 – Share of employment of Ocean Economy in national/regional employment (2017)



Source: OSA (PT/RAA/RAM) and THE EU BLUE ECONOMY REPORT 2020 (others MS)



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Methodological notes:

Introduction

The Ocean Satellite Account (OSA) is developed by Statistics Portugal in partnership with the Directorate-General for Maritime Policy (DGPM), being edition held in close articulation with the Regional Directorate of Statistics of Madeira (DREM) and the Statistics Regional Service of the Azores (SREA), which allowed getting specific OSA for the two Portuguese autonomous regions.

With the OSA-RAM is intended to provide statistical information that allows to assess the size and the importance of the ocean economy in the total economy, as well as to support the decision on public policy coordination of the sea, providing information on the structure of production activities related to it, the explanation of the involved services and on the characterization of the agents that provide them.

The main objective of the OSA-RAM is to provide an economic information system related to the ocean, consistent with the Regional Accounts (RA). The choice of RA as a reference reflects its importance as a representation of the functioning of the complete, reliable, systematized and internationally comparable economy. The OSA-RAM constitutes the most appropriate tool to estimate the size and the importance of the Ocean Economy (OE) in the RAM economy and for obtaining the information on the production structure of ocean-related activities

OSA-RAM contains information related to the output of basic prices, intermediate consumption and Gross Value Added (GVA) and still with the employment full-time equivalent, disaggregated into paid and unpaid employment and compensations. All variables must be consistent with each other, as they validate the system as a whole.

Methodological references

Satellite accounts have as main reference the National Accounts (NA) and RA concepts and methods, as defined in the European System of National and Regional Accounts (ESA 2010). Satellite accounts aim to expand the observation capacity of particular phenomena, constituting extensions in greater detail of NA and RA.

The OSA also has as main methodological references the study made to Eurostat, in 2009: Ifremer et al., "*Study in the field of maritime policy - Approach towards an Integrated Maritime Policy Database*" and the work done and in progress, since 2012, in the European Commission (EC) / Directorate-General for Maritime Affairs and Fisheries (DG MARE), in the Blue Growth scope: *Blue growth*". The second edition of OSA was also based on the Methodological Report produced by Statistics Portugal and DGPM, in 2016: "*Satellite Account for the Sea – 2010-2013. Methodological Report*".

Concepts and nomenclatures

The conceptual definition of Ocean Economy is: "Economic activities that take place at sea and others that are not taking place at sea but depend on it, including marine natural capital and non-tradable services of marine ecosystems" which are not, however, recorded in the OSA as those are not included in production boundary of NA/RA as defined in ESA 2010.

The economic activities that take place at the ocean are, for example, maritime transport, fisheries and marine aquaculture, bioprospecting, research and exploration of non-living marine resources, maritime tourism, marine equipment operation – namely information, communication and electronic technologies (ICET) maritime and submarine equipment – and services, such as marine information and communication services.

Among the economic activities that depend on the ocean, but do not take place at sea, the following groups are distinguished:

- The activities that directly depend on the enjoyment of goods and services of marine ecosystems (e.g. coastal tourism);
- The activities that provide goods and / or provide specific services to the activities that take place at the ocean (e.g. ports and logistics, construction, maintenance and ship repair, ship dismantling, construction and marine equipment maintenance and maritime services on land);
- The activities belonging to certain functional chain values, which can hardly be separated, and that influence, directly, the activities that take place at the ocean. In this situation are the value chain centred on fish (e.g. aquaculture in inland waters, as it uses the same fish distribution channels), the shipping value chain focused on water vessel and nautical tourism value chain (covering namely the maritime tourism companies operating in water).

The remaining activities, which do not operate or not depend on the ocean, represent the rest of the economy.

The definition of Ocean Economy takes into consideration the economic activities that use the ocean, directly or indirectly, focusing on the value chain in which they operate, covering both activities that are located in the maritime area, as others located in coastal areas and also in remote areas of the coast, if related to the Ocean. In this context, the



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economic value of production and consumption of "maritime" goods and services will depend on the set of productive activities defined in the scope of this study, as activities related directly or indirectly to the ocean.

The activities or goods and services (products) related to the Ocean Economy are fundamentally identified as those who meet simultaneously the following conditions:

1. Activities and / or goods and services that, in the absence of the ocean, would cease to exist in significant quantities, or their consumption would be significantly reduced;
2. Existence of statistical information available or that can be obtained.

The OSA compilation started with the transposition of maritime economy definition for statistical language, specifically the identification of ocean activities and products in the official classifications in use. The delimitation and characterization of the reference population of OSA (named "universe"), inventorying kind of activity units (KAU) and proceeding to their classification, was conducted by Economic activity (Portuguese Classification of Economic Activities – CAE) and by groups of activities, according to a specific classification designed by Statistics Portugal and DGPM.

The scope of the Ocean Economy considered in the OSA, aggregates activities in two main areas: "Established activities" and "Emerging activities" which, in turn, are divided into groups. It was considered nine groups, eight of which correspond to established activities (groups 1 to 8) and the last group 9 - New uses and resources of the ocean, which congregates emerging activities. The adopted criterion for the classification of economic activities as established or emerging obeyed the international logic of maturity level of the markets, namely what was followed in the EU, in the "Blue Growth" report for the purpose of international comparisons.

It was adopted a value chain logic in the larger extension possible, taking into account, inter alia, the level of industry disaggregation permitted by the National Statistical System (NSS). Given this restriction, the methodological option was to consider Maritime and Marine Equipment and Services as independent groups, containing cross economic activities to other groups.



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Table 3 – Groups of economic activities for the Ocean Economy in OSA

Groups	Activities	
	That operate on the Ocean	That do not operate at the ocean but depend on it*
ESTABLISHED ACTIVITIES		
1. Fisheries, aquaculture, processing, wholesale and retail of its products	Sea fishing	Inland fishing
	Marine aquaculture	Inland aquaculture
	Aquaculture in inland waters	
	Processing industry	
	Processing of fishery and aquaculture products	
		Marketing of fishery and aquaculture products
2. Non-living marine resources	Research marine mineral resources	Sea salt extraction and refining
	Research of conventional energy resources (oil and gas)	
	Exploitation of marine mineral resources	
	Operation of conventional energy resources	
3. Ports, transports and logistics	Maritime freight transport	Inland freight transport
	Transport of passengers by ferry	
	Cruises	
	Ports and logistics	
	Boating (recreational and sport)	
4. Recreation, sports, culture and tourism	Cultural activities (eg heritage, shows, events related to the sea)	
		Coastal tourism (ex.: sun / beach)
		Imputed rents (second homes)
5. Shipbuilding, maintenance and repair	Shipbuilding	
	Naval maintenance and repair	
		Naval dismantling
6. Maritime equipment**		Machinery and marine equipment
	Submarine cables and pipelines	
	Ocean Information Technology, Communication and Electronics (ICTE)	
	Maritime robotics	
	Other equipment (e.g. textiles, clothing, packaging, etc.)	
7. Infrastructures and maritime works	Coastal defense works	
	Port infrastructure	
8. Maritime services**	Education and R & D	
	Governance	
	Maritime information and communication services	
		Consulting and services to companies in the areas of the sea
		Financing and marine insurance
Other services		
EMERGING ACTIVITIES		
9. New uses and resources of the ocean	Marine biotechnology	
	Unconventional energy resources (gas hydrates)	
	Marine renewables	
	Gas storage	
	Earth observation services	

Note: * Or other aquatic environment; ** Encompass transversal uses and activities to other groups.

- Living resources
- Non-living resources
- Infrastructure, uses and industrial activities
- Infrastructure, uses and services activities
- Governance activities



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Groups:



1 – Fisheries and aquaculture Fisheries and aquaculture, processing and wholesale and retail of its products - includes activities related to the value chain of fishery and aquaculture products. The core activities include Fisheries and Aquaculture, with connections upstream to the food industries for animals, namely for aquaculture, and downstream with the transformation industry, such as processing and preserving of fish, crustaceans, and molluscs. It also includes the production of ice, cold storage and trade, wholesale and retail trade, of fishery and aquaculture products.



2 – Non-living marine resources – includes activities related to the research and exploitation of conventional energy resources (oil and natural gas), to research and exploitation of marine minerals and the extraction and refining of salt and production condiments derived from it. It also includes the desalination of seawater.



3 – Ports, transports and logistics – includes activities related to the water transportation value chain, whose main activity is the shipping of goods and passengers. Downstream includes port services and rental of maritime and inland waterway transports and river transport of goods and passengers.



4 – Recreation, sports, culture and tourism – includes the maritime activity of recreation and sport, the maritime dimension of culture and maritime and coastal tourism, including maritime touristic activities operating in water. This group includes activities related to boating, which are considered recreational boating and nautical sports. Coastal tourism includes housing, imputed rents of second homes, real state promotion of tourist accommodation, restaurants, travel agencies and associated recreational activities and leisure, including the related cultural activities, like the activities considered in the Tourism Satellite Account, only the ones taking place in coastal areas.



5 – Shipbuilding, maintenance and repair - comprises construction activities of ships and floating platforms, including pleasure and sport boats, as well as the repair and maintenance activities of boats and the dismantling of end-of-life vessels.



6 – Maritime equipment - comprises diverse manufacturing activities such as, for example, the ones allowing equipping a vessel or a floating platform. It is a heterogeneous group, dedicated primarily to building and repair of relevant equipment for the other activities of the ocean economy. It was decided, therefore, to bring together in one group all the activities identified in the manufacturing industry with the production / repair of marine equipment of support for most of the activities of the other groups.



7 – Infrastructure and maritime works - includes activities related to construction works and expansion of port terminals in order to develop maritime and land accessibility conditions, It also includes the construction and repair of ports, marinas, as well as dredging, protection and coastal defence, etc.



8 – Maritime services - includes, as the name indicates, the service activities related to the ocean. Includes education, training and R&D in areas related to the ocean, governance activities, such as defence and maritime security and maritime spatial planning, and a large subgroup of other service activities encompassing maritime information and communication services, consulting and business services in the ocean areas, maritime finance and insurance, trade and distribution activities related to the ocean and others.



9 – New uses and resources of the ocean - was established in order to quantify a set of emerging activities, yet with little economic importance, which would, otherwise, be "diluted" in other activities. The relevance of this isolated group was evaluated during the work. Includes the marine biotechnology; marine renewable energies; gases storage; research and exploitation of unconventional energy resources (gas hydrates) and the services of earth observation.



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In addition, the OSA information was segmented into observation levels:

- **Characteristics activities** - activities in which an important part of the operations takes place at ocean or whose products come from or are intended for use at ocean or on the shore limit. This level includes all groups except 6-*Maritime equipment*, 8-*Maritime services* and part of 4-*Recreation, sports, culture and tourism* (notably coastal tourism);
- **Cross-cutting activities** - activities of support to the remaining activities considered under the OSA scope. Include group 6- *Maritime equipment* and 8-*Maritime services*;
- **Activities favoured by the proximity of the sea** – this set of activities corresponds to coastal tourism (group 4) that includes the accommodation activities, restaurants and imputed rents of second homes located in villages in coastal areas (based on the European classification of coastal and non-coastal areas, i.e. parishes with maritime coast or with 50% or more of the surface up to 10 km away from the sea (see Methodology, for further detail).

Methodology

The **selection of the OSA-RAM reference population** for the years 2016-2017 used the universe of RA as a reference (Base 2016). Whenever it was concluded that a certain kind of activities unit (KAU) operations were relevant in the ocean area, it was included, regardless of the CAE code.

Regarding **education**, an estimate was made for services related to the teaching of subjects / courses linked to the Ocean.

For **Research and Development (R&D)**, the main data source was the Survey on National Scientific and Technological Potential (IPCTN), which, since 2014, individualizes the ocean projects, through the following strategic priority codes: 10.1. Ocean economy - marine food resources (fisheries and aquaculture), 10.2. Ocean economy - natural systems and renewable energy resources, 10.3. Ocean economy - deep-sea resources, 10.4. Ocean economy - ports, logistics, transport, shipbuilding and maritime works and 10.5. Ocean economy - culture, tourism, sport and leisure. This information was complemented namely by IES data and information provided by the Foundation for Science and Technology (FCT).

The estimate of **employment** in the OSA consisted of the calculation of the Full-Time Equivalent (FTE) for entities considered for the purposes of “ocean” production, according to the respective economic activities and institutional sectors to which they belong. The FTE is equivalent to the number of full-time equivalent jobs and is defined as resulting of the total hours worked divided by the annual average of hours worked in full-time jobs in the economic territory.

Tourism and coastal areas

The compilation of information on tourism within the scope of the OSA, which includes hotels and similar, restaurants and similar establishments, travel agencies, tour operators and other reservation services and related activities, was particularly complex.

Under the OSA, and according to *Turismo de Portugal*, IP, in ocean-related tourism analysis were considered two aspects:

- **consumption stemming from the motivations of consumers;**
- Territory (geographic location of consumers of tourism products), taking into account the definition of coastal area.

As far as motivation of consumers is regarded, in the context of OSA, different typologies were registered, namely:

- cruises;
- nautical (recreational / sports);
- sun and sea;
- sporting event (who participate) and for sports-event (onlooker who goes to watch the event);
- health tourism (e.g.: thalassotherapy);
- scientific tourism/research;
- “nature tourism” (e.g.: observation of cetaceans).



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The criteria for defining “coastal region / zone” is the following:

- If the parish is by the sea, it is part of the coastal region;
- If the parish is not by the sea but has 50% of its surface to a 10km away from the sea, is also considered coastal parish.

With the application of this criterion, uniform at national level, all parishes in the Autonomous Region of Madeira are considered coastal.

However, this criterion was complemented with the **component motivation**, having proceeded to the breakdown of the business component, which was not included in the estimates of OSA.

The simple application of geographical criteria could imply an overvaluation of the Ocean component. Thus, in the case of the Autonomous Region of Madeira, tourist entities dedicated to other activities, not related to the sea, were left out whenever identified.

In very synthetic terms, the calculation methodology for this component may be summarized as follows:

- Restaurants - Using information related to NA/Tourism accounts it was possible to consider only the situations related to leisure tourism purposes, i.e. dislocations made for business reasons were not considered, since it was assumed that they didn't carry out for sea reasons;
- Hotels - The headquarters of hotel chains were not considered. As in the case of restaurants, using detailed information on NA/Tourism accounts it was possible to consider only the consumption for leisure tourism purposes, i.e., dislocations made for business reasons were not considered, since it was assumed that they didn't carry out for sea reasons;
- Imputed rentals of second homes - imputed rents correspond to income associated with assets that families hold in the form of own housing and are the counterpart of accommodation services that this asset provides. The estimated value for these services - the imputed rents - is embedded in GDP. The methodology for measuring the rents to be charged followed the 2010 SEC Recommendations, resorted to the use of the 2011 Housing and Population Census, more specifically the information on actual rents, and the use of an econometric model of hedonic regression.

Final considerations

The OSA is an exploratory work based on concepts and compilation practices that are still under development at the international level. On the other hand, the ocean economy is a broader concept than the one that was operationalized in the satellite account for statistical purposes. It should also be noted that, according to the OECD, any complete Ocean Economy definition should contemplate, besides the set of economic activities that take place at ocean and others that, if not carried out at ocean, depend on it, also the marine natural capital environment and the non-marketable services of the marine ecosystems. However, as mentioned above, these activities are not included in the OSA since they are not included in the NA and RC production boundary according to the ESA 2010.

