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Progress Report on the Mediterranean Database of Cetacean Strandings

Presented by:
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Progress Report on the Mediterranean Database of Cetacean Strandings

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With the participation of:

- Department of Biology-Chemistry, Faculty of Natural science, University of Shkodra (**Albania**)
- University of Oran Es Senia, (**Algeria**)
- Institute of Fish Resources, Varna (**Bulgaria**)
- Faculty of Veterinary Medicine, University of Zagreb; Blue World Institute of Marine Research and Conservation; State Institute for Nature Protection (SINP) (**Croatia**)
- Centre de Recherche sur les Mammifères Marins de la Rochelle (CRMM) ; Groupe d'Etude des Cétacés de Méditerranée (**France**)
- ARION-Cetacean Rescue & Rehabilitation Research Centre (**Greece**)
- Israel Marine Mammals Research and Assistance Center (IMMRAC) (**Israel**)
- Marine Conservation, Nature Conservation Department, Environment General Authority (**Libya**)
- ACCOBAMS (**Monaco**)
- "Naturalist group Guelaya" (**Morocco**)
- National Institute for Marine Research and Development "Grigore Antipa" (**Romania**)
- Morigenos-Marine Mammal Research and Conservation Society (**Slovenia**)
- Aula del Mar de Málaga (Andalucía); Centro de Recuperación de Fauna Silvestre "El Valle" (Murcia); Conselleria d'Agricultura i Pesca del Govern de les Illes Balears; Consejería de Medio Ambiente de la Ciudad Autónoma de Ceuta; Consejería de Medio Ambiente (Melilla); CRAM - Fundació per a la Conservació i Recuperació d'Animals Marins; GRAMPUS (Colectivo para el Estudio y Conservación del Medio Marino, Huelva); Guardia Civil de Melilla; Sociedad Española de Cetáceos (**Spain**)
- Biodiversity and Protected Areas Directorate, General Commission for Environmental Affairs, Ministry of Local Administration and Environment t; General Establishment of Fisheries in Syria (**Syria**)

- Faculté des Sciences de Sfax; Institut National des Sciences et Technologie de la Mer –INSTM (**Tunisia**)
- Turkish Marine Research Foundation (**Turkey**)
- Green Balkans NGOs (**Greece**)
- Fisheries and Marine Research Officer. Ministry of Agriculture, Natural Resources and Environment. Department of Fisheries and Marine Research. Nicosia (**Cyprus**)
- Centro Studi Cetacei (**Italy**)
- Centre de recherches Marines. CNRS: Betraun (**Lebanon**)
- Faculty of Natural Resources and Environmental Science. FNRES, OMAR MUKHTAR UNIVERSITY. EI-Beyda (**Lybia**)
- Brema Laboratory. Simferopol (**Ukraine**)
- Italian Stranding on-line Database (BDS) (**Italy**)
- The Mediterranean Marine Mammals Tissue Bank (**Italy**)

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1. INTRODUCTION: THE MEDACES PROJECT

1.1. Origin and history of MEDACES

According to the recommendations listed on Annex VII of the 11th Ordinary Meeting of the Contracting Parties of the Barcelona Convention and its Protocols of the Mediterranean Action Plan, UNEP (Malta, 27-30 October 1999), relating to the ulterior implementation of the Action Plan for Cetacean Conservation in the Mediterranean Sea and other initiatives, the co-ordination of the information of stranded cetaceans on the coast of the Mediterranean countries is required for a better knowledge of cetaceans and their eventual protection and conservation.

Cetacean strandings represent an important tool for the development of scientific programs on cetacean conservation. The occurrence of stranded dolphins and whales provides an invaluable opportunity to gain insight on aspects of their population biology, as well as to investigate causes of natural or anthropogenic mortality that will help to assess the impact of potential threats. Altogether, these data can be used to determine the health status of cetacean populations and to identify conservation problems and reveal unusual mass mortality episodes (Geraci and Lounsbury, 2005; Peltier et al., 2009).

Stranding networks have been developed over the last decades in countries with high concern for cetacean conservation. The establishment of these stranding networks with centralized databases has facilitated the collection and dissemination of relevant information on these marine vertebrates and their conservation status.

The establishment of standards to keep the information and samples from cetacean strandings in the Mediterranean waters is very important. In this context, it is necessary to compile all details of cetacean strandings, including an inventory of the samples taken, in a single database maintained by a Mediterranean Database of Cetacean Strandings (MEDACES).

In November 2001, the 12th Ordinary Meeting of the Contracting Parties to the Convention for the Protection of the Mediterranean Sea against Pollution and its Protocols, within the "Biological Diversity and Specially Protected Areas" section, recommended the implementation of an Action Plan for the Conservation of Cetaceans in the Mediterranean Sea, to approve the offer by Spain with regard to the establishment in Valencia of a Mediterranean database on cetacean strandings (MEDACES). The Regional Activity Centre for Specially Protected Areas (**RAC/SPA**) is

the depositary for the database, whose management is entrusted to the University of Valencia's Cavanilles Institute of Biodiversity and Evolutionary Biology (**ICBI**BE), with the initial financial support of the Spanish Ministry of Environment and Rural and Marine Affairs (**MMA**). Nowadays, MEDACES database is supported exclusively by RAC SPA since 2010-11. This database strictly adheres to a deontological code.

The Mediterranean Database of Cetacean Strandings has been expanded to cover regions adjacent to the Mediterranean, i.e. the Black Sea and the contiguous Atlantic waters, as defined in the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area (**ACCOBAMS**).

1.2. MEDACES Database and web-page

The construction of the MEDACES database and its web-page (<http://medaces.uv.es>) are both operational.

MEDACES is a relational database, i.e., the information of every stranding record is stored in different, related tables. "Cetacean" has been established as the main entity of the database, containing the basic information along with the geometry for the geographical location of the stranding. The tables related to this entity contain the basic information regarding the institution sending the data, the cetacean species, body measurements, etc. The advanced data contains information on the organs and samples taken and preserved for different types of life-history studies (toxicology, histology, reproductive state, feeding ecology and diet based on digestive contents, etc.).

MEDACES is managed as a geodatabase (*Geographic database*), of the ArcGis™ family from ESRI®, using the Microsoft Access software. The geodatabase is able to represent geographical data of the strandings, being able to get the location of any event in a map.

The MEDACES web-page provides information about the MEDACES project and the collaborating institutions. Moreover, the web-page allows downloads which give users access to forms and programs that help to submit stranding data to the MEDACES database. The MEDACES web-page has two specific tools that are accessible for users: a search function for information related to the strandings. The search tool contains searching criteria by species, sex, date, country, province and locality. The output is a

printable list of records fulfilling the searching criteria. Moreover, by clicking the number of the report, all the information of a stranding on the list is available.

Nevertheless, the geodatabase server is not operational since 2009, and the data shown through the MEDACES webpage, although georeferenced, cannot be seen through the interface of the map. Georeferenced data can be provided via e-mail if this is required by a MEDACES user.

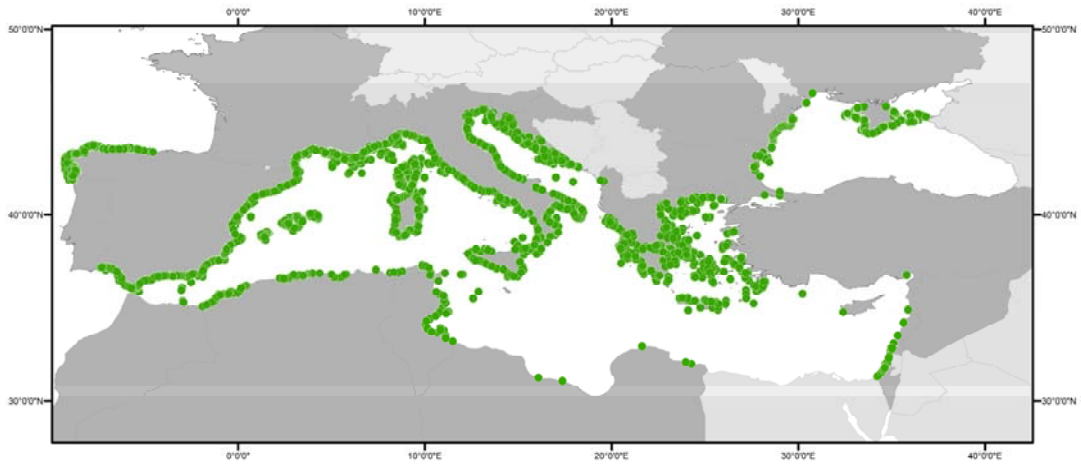


Figure 1. Map shown at 'Data set' ('Data') from MEDACES web-page where available cetacean stranding maps can be seen.

1.4. Obtaining the data

Stranding data has been sent to MEDACES by national stranding networks, national authorities, research and conservations institutions as well as RAC-SPA and ACCOBAMS. MEDACES provides three different options to facilitate the gathering of stranding data from the different institutions:

1) Database Extract

The *Database Extract* option allows submission of extracts of large data sets. This is especially relevant for institutions with an extended experience and large amount of records on strandings in their own databases. Submitted data are later transferred to the MEDACES database.

2) Paper Form (MEDACES form.pdf)

Stranding data can also be filled into a paper copy of a PDF document prepared. This possibility is aimed at institutions with limited access to computer facilities.

3) MEDACES Form Excel

The *MEDACES Form Excel* option allow data to be filled in and stored in a excel file format. The excel file can be sent to MEDACES by e-mail or by ordinary post.

Since 2009 all the data submitted to MEDACES has been sent in MEDACES form excel, which seems to be the quickest way of gathering the own institution data. In fact, since 2009 the data included to MEDACES database is the basic information of each stranding. The basic data included is:

Species
Province/State/County
Locality
Site of stranding (name of the beach, harbour, etc.)
Coordinates (latitude, longitude)
Date
Sex
Animal length (cm)
Stranded alive (status) / Stranded dead (carcass status)
Biological samples collected
Cause of death
Human interaction: none/boat collision/fishing gear/intentional/unknown
Comments

2. THE STRANDING DATA

2.1. Collaborating institutions

The MEDACES database currently contain stranding information from the coasts of Albania, Algeria, Bulgaria, Croatia, France, Greece, Israel, Libya, Monaco, Morocco, Romania, Slovenia, Spain, Syria, Tunisia and Turkey, Cyprus, Ukraine and Italy.

The following institutions have collaborated with their stranding data:

Albania

- Department of Biology-Chemistry, Faculty of Natural science, University of Shkodra (Denik Ulqini)

Algeria

- University of Oran Es Senia (Data provided by Regional Activity Centre for Specially Protected Areas (RAC/SPA))

Bulgaria

- Institute of Fish Resources (Varna)
- Green Balkans NGOs

Cyprus

- Fisheries and Marine Research Officer. Ministry of Agriculture, Natural Resources and Environment. Department of Fisheries and Marine Research. Nicosia

Croatia

- Blue World Institute of Marine Research and Conservation
- Faculty of Veterinary Medicine, University of Zagreb
- State Institute for Nature Protection (SINP)

France

- Groupe d'Etude des Cétacés de Méditerranée (Marseille)
- Centre de Recherche sur les Mammifères Marins de la Rochelle (CRMM)

Greece

- ARION-Cetacean Rescue & Rehabilitation Research Centre (Petroupolis)

- Environmental Research Bureau (Milos)
- Fisheries Research Institute, National Agricultural Research Foundation (Kavala)
- Hellenic Centre for Marine Research

Italy

- Museo di Storia Naturale di Milano and Dipartimento di Biologia Animale Università degli Studi di Pavia. Italy. Stranding data from 2001 to 2008
- Centro Studi Cetacei
- Museo di Storia Naturale di Milano
- Dipartimento di Biologia Animale Università degli Studi di Pavia
- Italian Stranding on-line Database (BDS)

Israel

- Israel Marine Mammals Research and Assistance Center (IMMRAC)

Lebanon

- Centre de Recherches Marines/CNRS. Batroun

Libya

- Marine Conservation, Nature Conservation Department, Environment General Authority
- Faculty of Natural Resources and Environmental Science. FNRES, Omar Mukhtar University. El-Beyda

Monaco

- Groupe d'Etude des Cétacés de Méditerranée (Marseille)
- ACCOBAMS (Monaco)

Morocco

- Naturalist group Guelaya: data sent by Niki Entrup (Whale and Dolphin Conservation Society)

Romania

- National Institute for Marine Research and Development "Grigore Antipa" (Constanta)

Slovenia

- Morigenos-Marine Mammal Research and Conservation Society (Ljubljana)

Spain

- Sociedad Española de Cetáceos (SEC)
- CRAM - Fundació per a la Conservació i Recuperació d'Animals Marins (Cataluña)
- Departament de Medi Ambient de la Generalitat de Catalunya
- Conselleria de Territori i Habitatge de la Generalitat Valenciana
- Universitat de València (Comunitat Valenciana)
- Conselleria d'Agricultura i Pesca del Govern de les Illes Balears
- Fundació Marineland (Illes Balears)
- Centro de Recuperación de Fauna Silvestre "El Valle" (Murcia)
- Consejería de Medio Ambiente de Murcia
- Ecologistas en Acción Almería-PROMAR
- Aula del Mar de Málaga (Andalucía)
- Consejería de Medio Ambiente de la Junta de Andalucía
- GRAMPUS (Colectivo para el Estudio y Conservación del Medio Marino, Huelva)
- Consejería de Medio Ambiente de la Ciudad Autónoma de Ceuta
- Septem Nostra (Ciudad Autónoma de Ceuta)
- Equipo de Protección de la Naturaleza (SEPRONA), Guardia Civil de Melilla, Consejería de Medio Ambiente (Melilla).
- División para la Protección del Mar. D.G. Sostenibilidad de la Costa y del Mar Ministerio de Agricultura, Alimentación y Medio Ambiente, Spain.

Syria

- Biodiversity and Protected Areas Directorate, General Commission for Environmental Affairs, Ministry of Local Administration and Environment (Damascus)
- General Establishment of Fisheries in Syria

Tunisia

- Faculté des Sciences de Sfax
- Institut National des Sciences et Technologie de la Mer -INST
Regional Activity Centre of Special Protected Areas. UNEP-MAP

Turkey

- Turkish Marine Research Foundation (Istanbul)

Ukraine

- Brema Laboratory (Simferopol).

Since last MEDACES report in 2012, MEDACES has been updated when new stranding data has been sent to the MEDACES administrators.

1. Institutions that have sent data strandings since 2012. This data is already included in MEDACES

- Israel has sent its historical stranding database in February 2012
- Spain. 2010-2012
- Lybia. 2010-2012
- Bulgaria. 2010-2012

In 2013, as a RAC-SPA initiative, new effort has been given to MEDACES. Letters asking for new stranding data have been sent to the different institutions that have collaborated with MEDACES previously.

2. Institutions that have sent their datasets after 2013 RAC-SPA initiative.

- Faculty of Natural Resources and Environmental Science, FNRES, OMAR MUKHTAR UNIVERSITY, Lybia.
- Department of Anatomy, Histology and Embriology. Faculty of Veterinary Medicine, Croatia.
- Israel Marine Mammals Research and Assistance Center. The Recanati Institute for Maritime Sudies. University of Haifa. Israel.
- Centre de Recherches Marines, CNRS, Lebanon.
- División para la Protección del Mar. D.G. Sostenibilidad de la Costa y del Mar Mº de Agricultura, Alimentación y Medio Ambiente, Spain
- Institut National des Sciences et Technologies de la Mer (INSTM), Sfax, Tunisia

3. Institutions that have communicated the willing to contribute after 2013 RAC-SPA initiative.

- GECEM - Groupe d'Etude des Cétacés de Méditerranée, France
- MBRC (Marine Biology Research Centre), Tajura, Libya
- Green Balkans NGOs, Bulgaria.
- Fisheries and Marine Research Officer. Ministry of Agriculture, Natural Resources and Environment, Cyprus
- Unité de Recherche OCEMAR, Université Mohammed V Asdal, Morocco.

2.2. Stranding data

2.2.1. Total data in MEDACES / Contribution of each collaborating country

Twenty riparian countries are contributing with their data to MEDACES (see Table 1 and 2). The database contains information on strandings dating back to 1941 (from Tunisia). In total, data from 14,030 strandings are registered in the MEDACES database.

Table 1. List of countries contributing to MEDACES, period (years) and number of stranding records included.

			NUMBER OF STRANDING DATA
COUNTRY	YEAR BEGINING	YEAR END	
Albania		?	2
Algeria	1975	2008	158
Bulgaria	2009	2013	46
Croatia	1990	2010	210
Cyprus	1999	1999	2
France	1968	2011	2,175
Greece	1944	2006	1,187
Israel	1993	2013	224
Italy	1997	2008	1,113
Lebanon		2013	3
Libya	2009	2013	5
Monaco	1989	2008	7
Morocco	2005	2005	1
Romania	2002	2008	375
Slovenia	2005	2008	4
Spain	1960	2012	7,150
Syria		?	1
Tunisia	1941	2009	111
Turkey	2000	2002	5
Ukraine	1980	2010	1,251
TOTAL			14,030

The figure 2 shows relative contribution of stranding record submissions from each of the participating countries. France, Greece, Italy, Spain and Ukraine are the countries with the highest number of submitted records.

It should be taken into account that stranding numbers depend on the length of coast line, the size of cetacean species populations in adjacent waters, the period of time from which data have been submitted, the performance of the existing stranding networks, and other eventual factors.

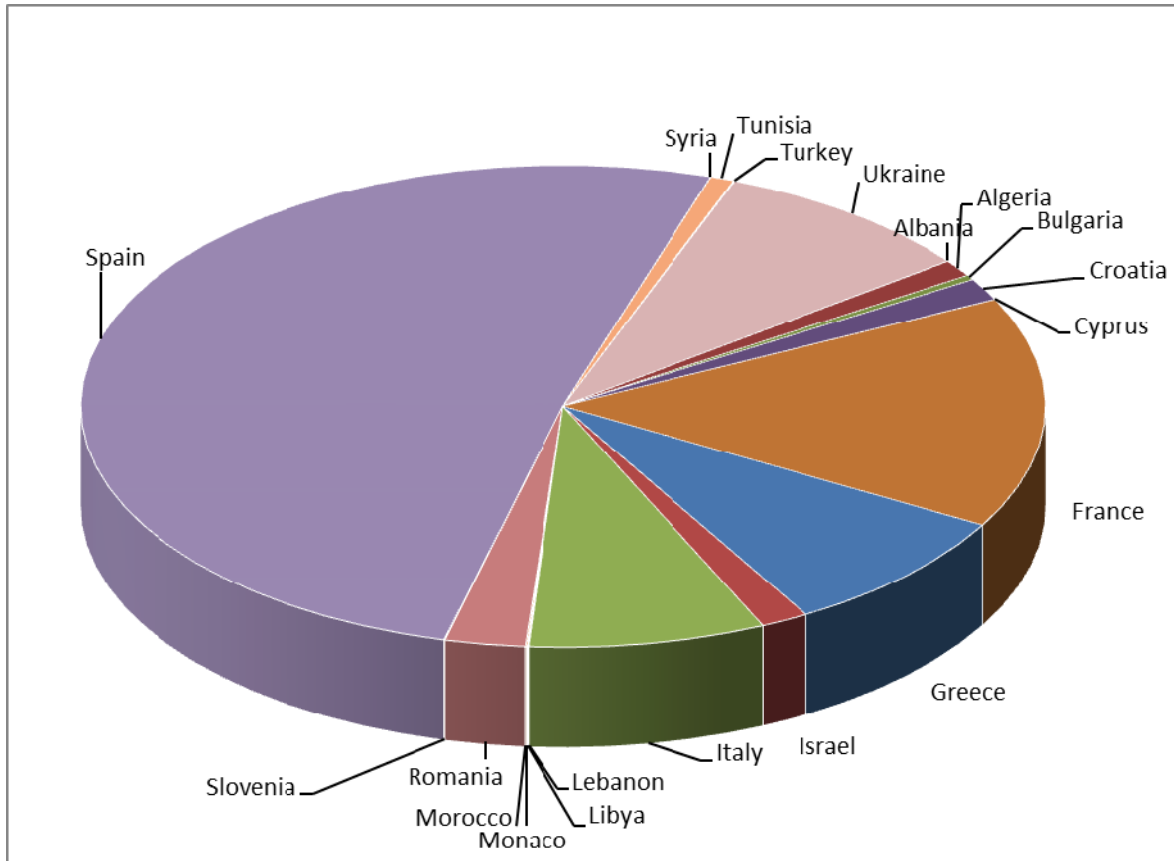


Figure 2. Strandings percentage sent to MEDACES by each country.

Figure 3 shows the relative contribution made by countries with less than ten stranding records sent to MEDACES.

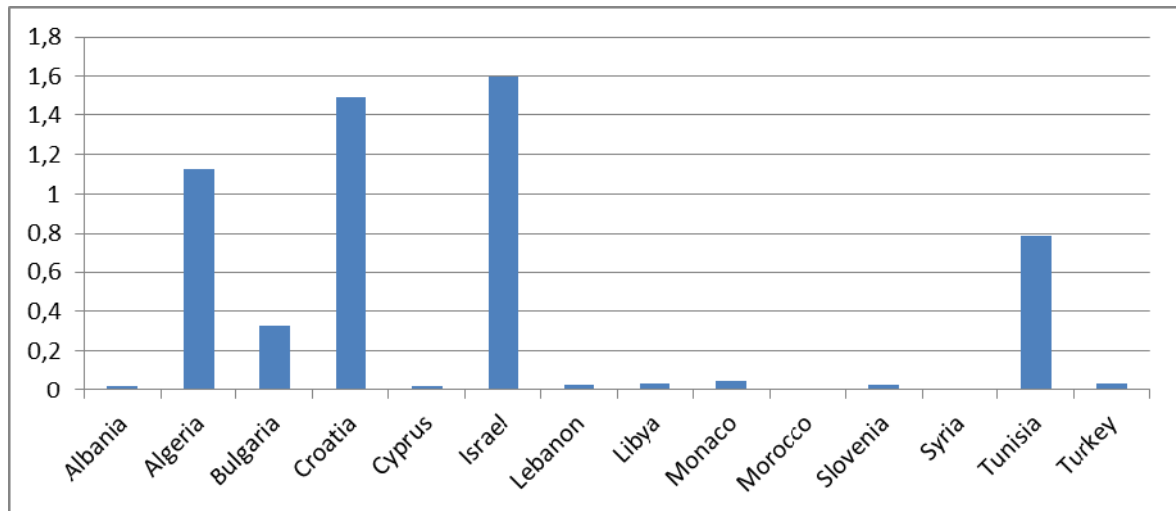


Figure 3. Strandings percentage of countries with minor contribution sent to MEDACES.

To date, almost all Mediterranean countries and some of the Black Sea coasts have contributed to the database. Figure 4 shows the distribution of the strandings registered in MEDACES.

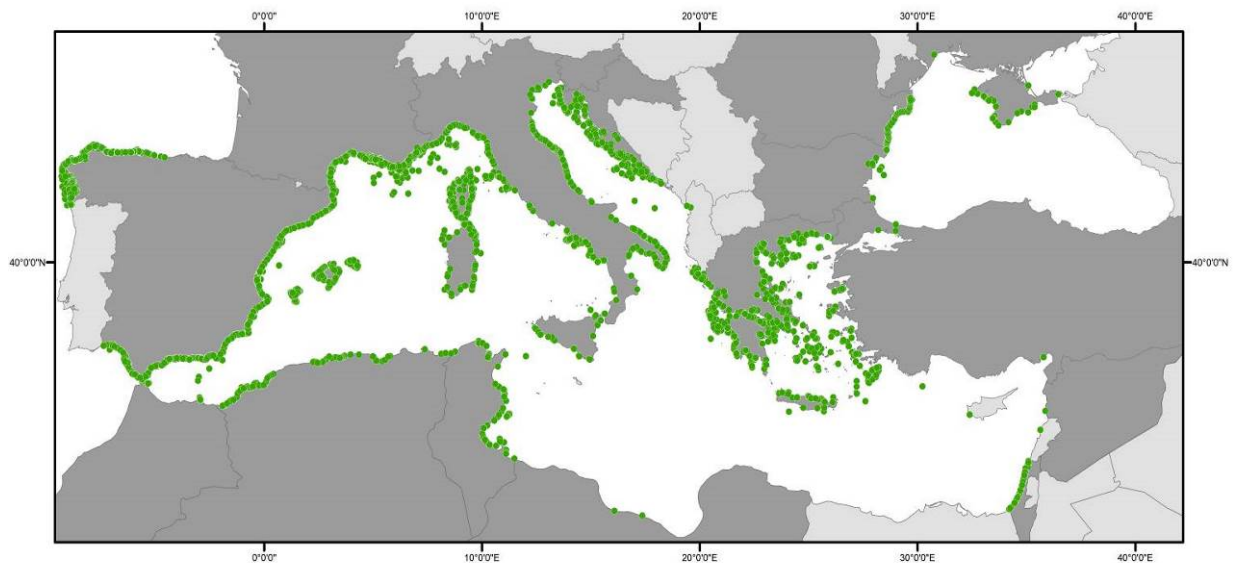


Figure 4. Cetacean stranding located along the Mediterranean and Black Sea coast using the data collected so far. The countries contributing with data to MEDACES are shown in dark grey colour. Green dots correspond to the stranding records.

2.2.2. Stranding species and numbers

Stranding data from MEDACES are consistent with the available information about the distribution of cetacean species in the Mediterranean and Black Seas (Notarbartolo and Birkum, 2010, Notarbartolo di Sciara, 2002 and references therein). The most common **cetacean species stranded** in the **Mediterranean sea** are (see Figure 5 and 6): fin whale, *Balaenoptera physalus*; sperm whale, *Physeter macrocephalus*; Cuvier's beaked whale, *Ziphius cavirostris*; long-finned pilot whale, *Globicephala melas*; Risso's dolphin, *Grampus griseus*; striped dolphin, *Stenella coeruleoalba*; common dolphin, *Delphinus delphis* and bottlenose dolphin, *Tursiops truncatus*. In the coasts of the Black Sea are harbour porpoise (*Phocoena phocoena relicta*), common dolphin (*Delphinus delphis ponticus*) and bottlenose dolphin (*Tursiops truncatus aduncus*).

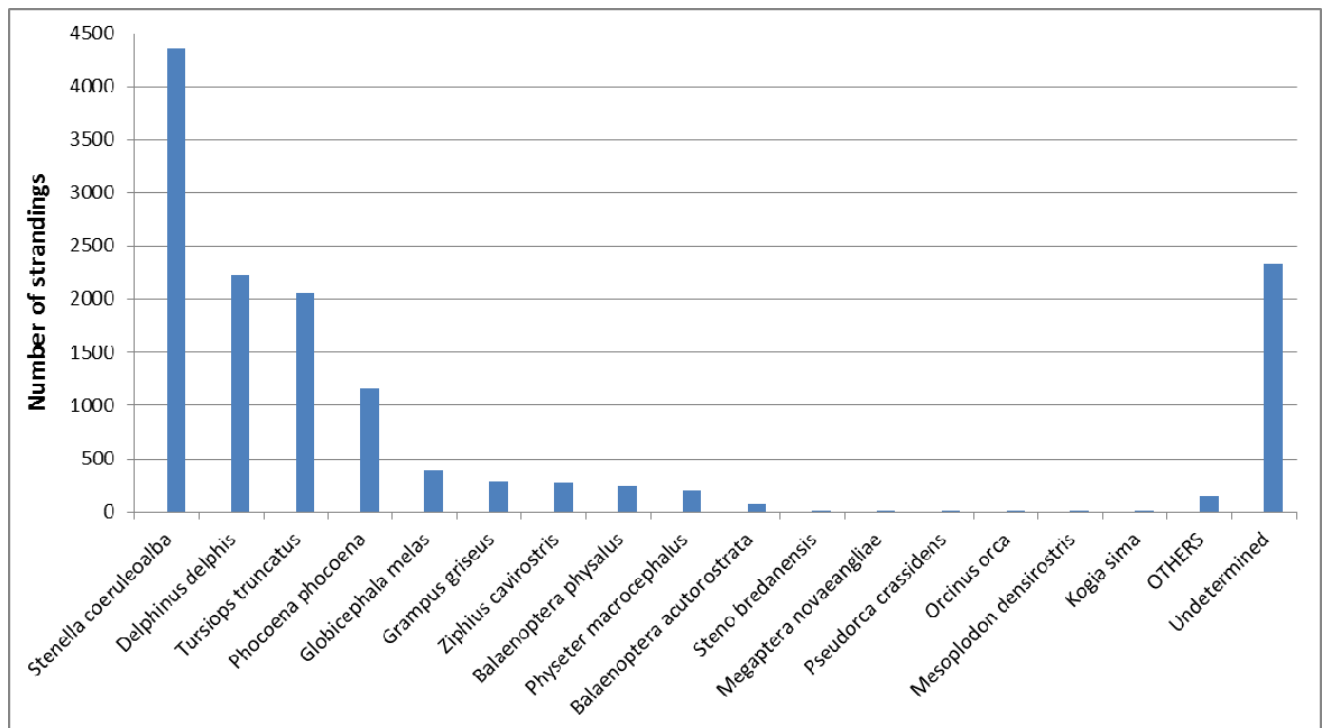
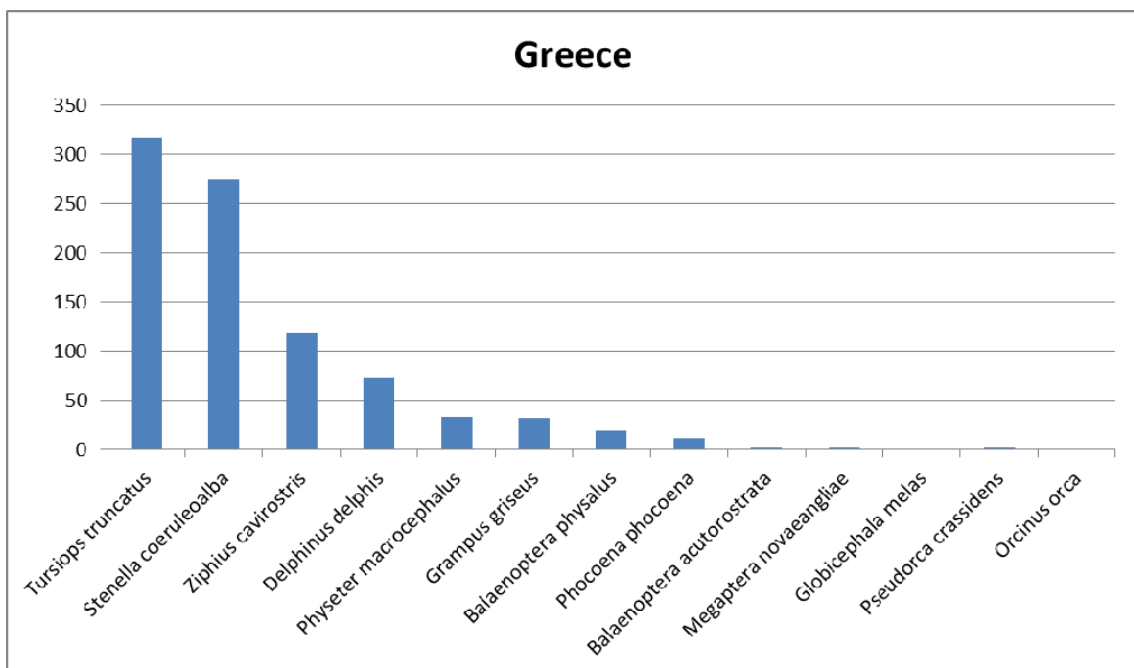
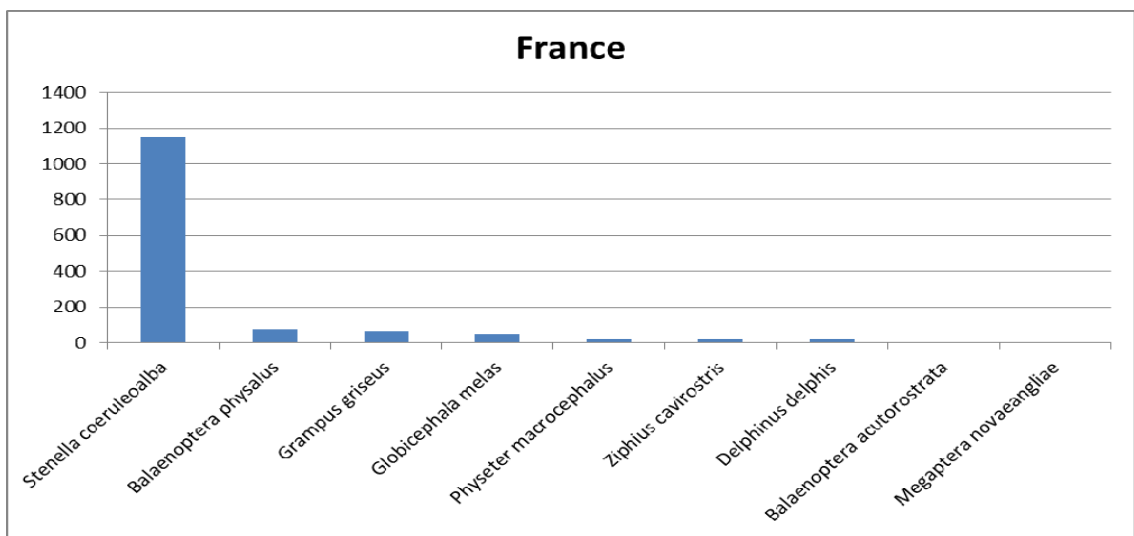
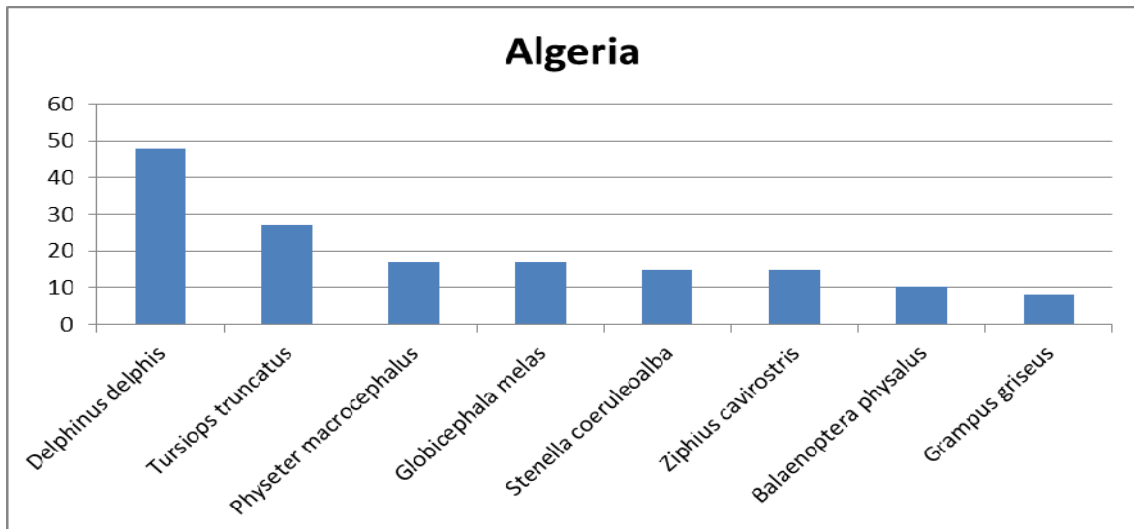
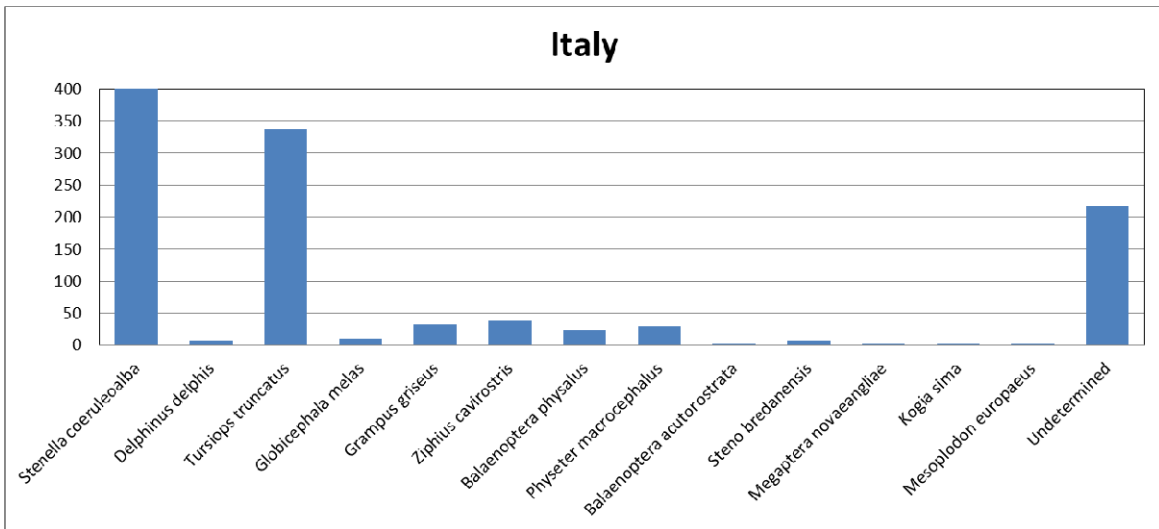
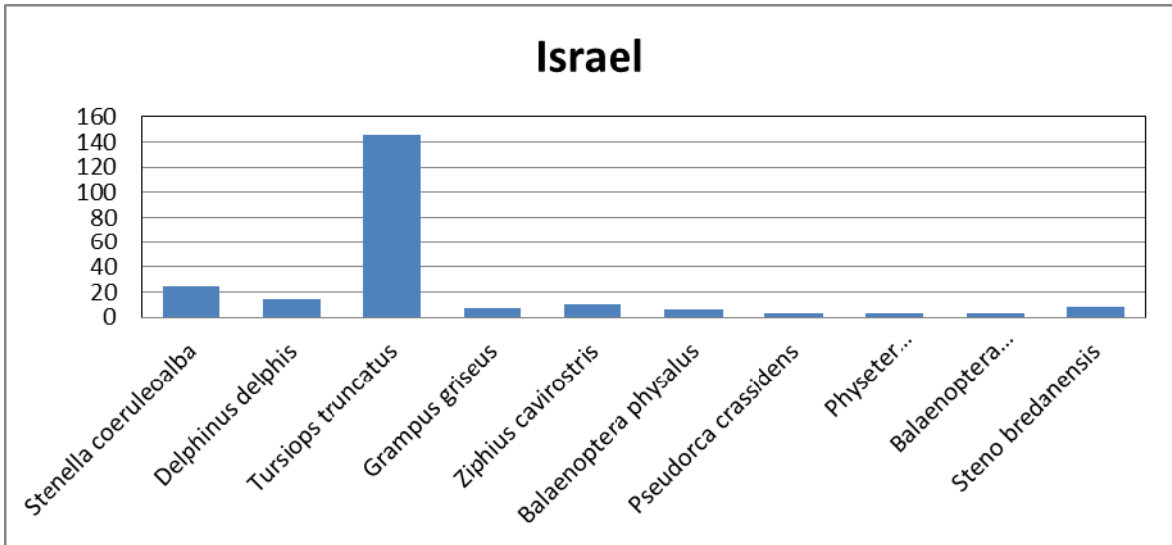
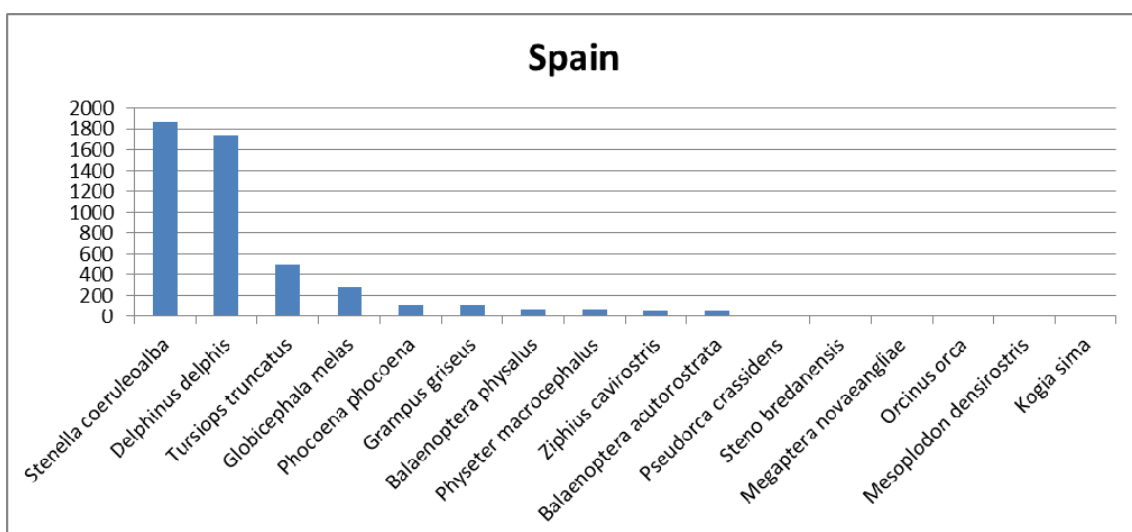
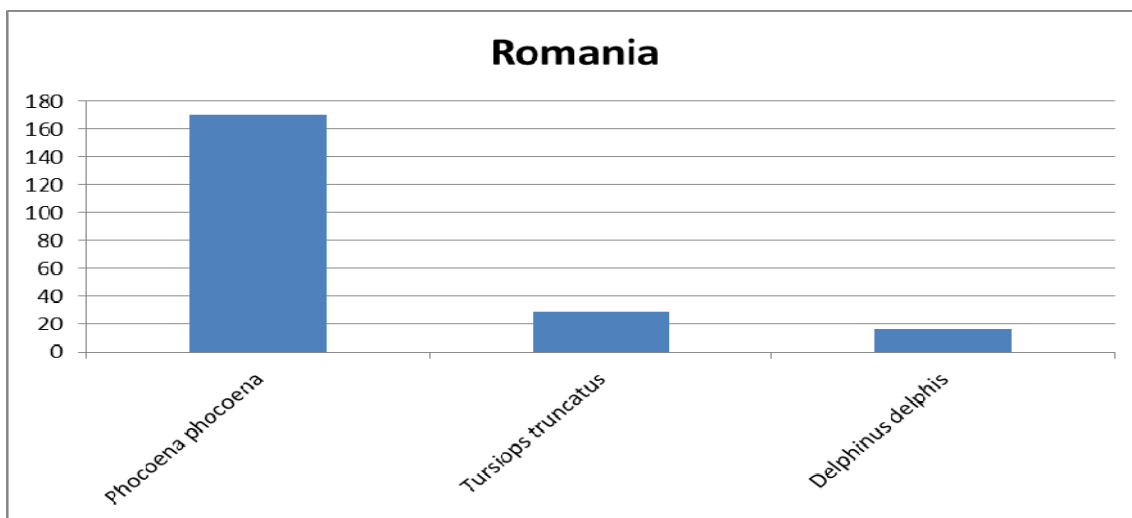
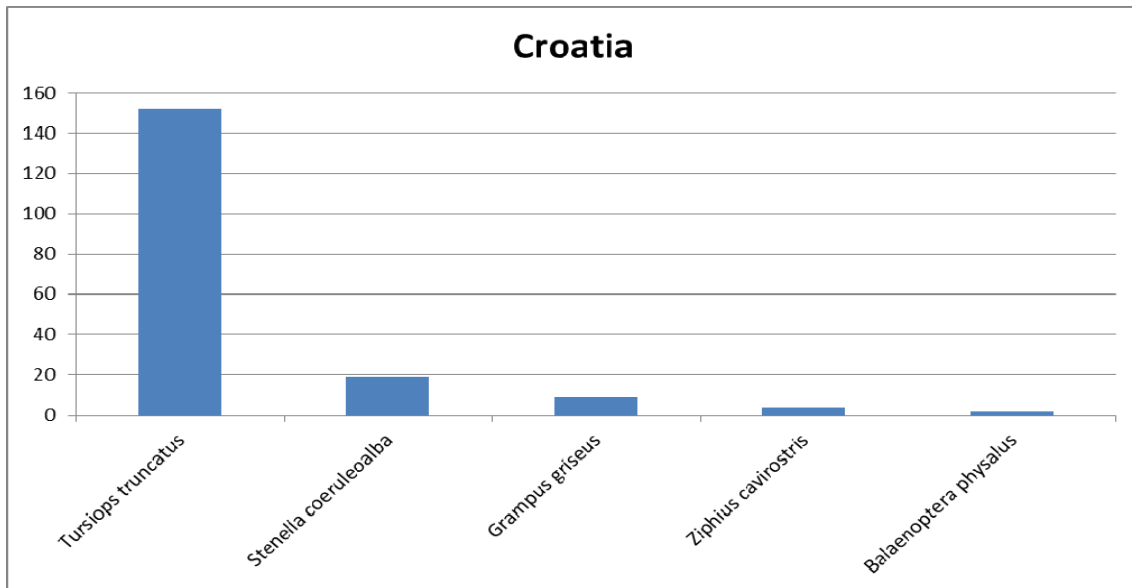


Figure 5. Number of strandings of each cetacean species recorded in MEDACES database along the coasts of all the riparian countries of the Mediterranean and Black Seas.







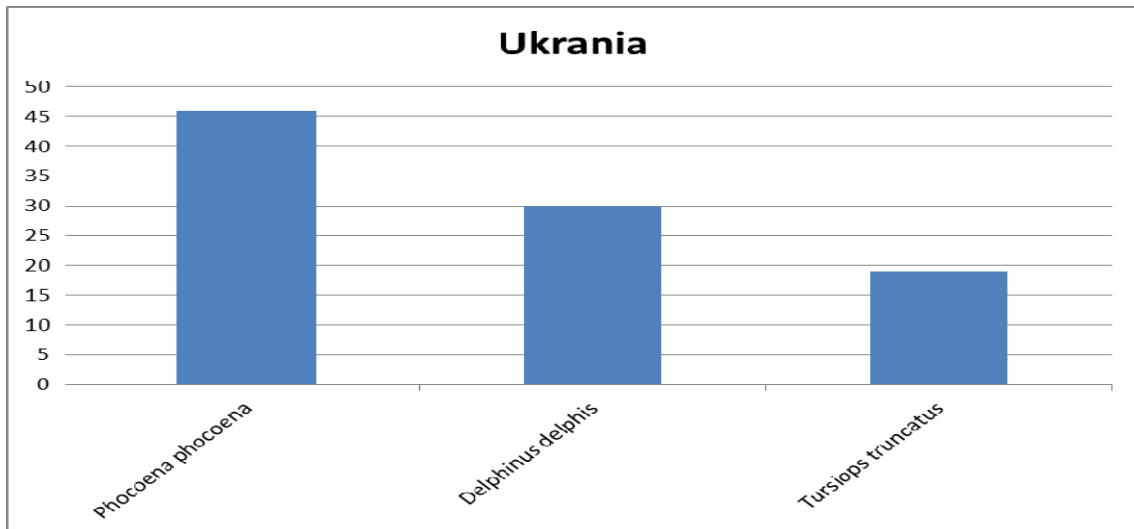
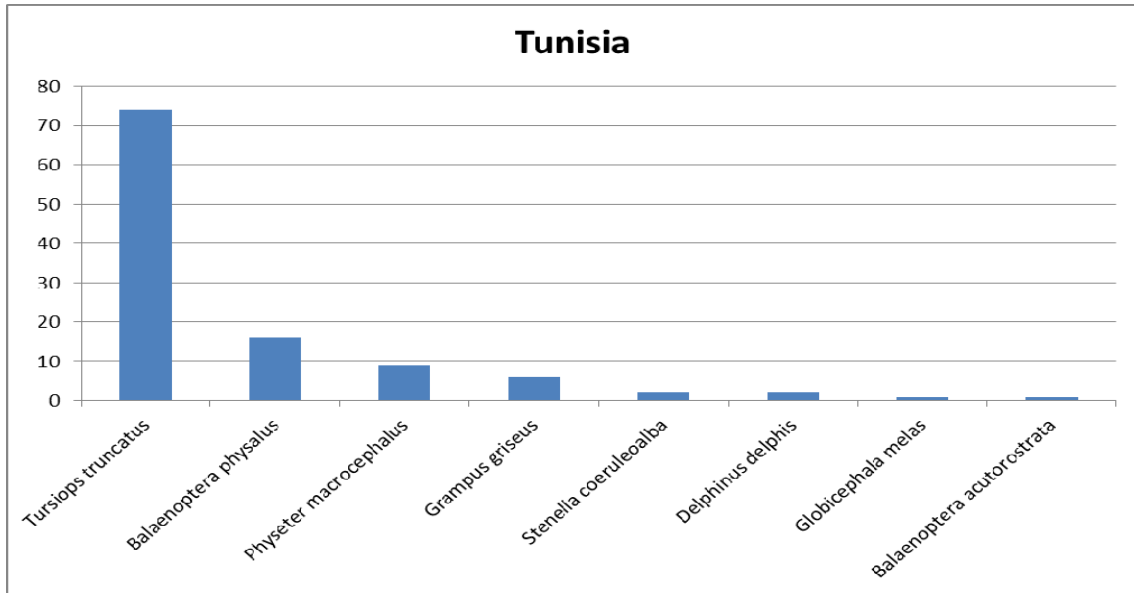


Figure 6. Number of specimens of each cetacean species stranded and reported in MEDACES individually by each of the riparian countries of the Mediterranean and Black Seas.

Spain is the country with the highest reported stranded species (n=18), probably related to the vicinity of the Atlantic Ocean. To this data Greece takes next place with 14 species, following France with 11, Israel with 10, Tunisia and Algeria with 8 and Croatia with 5 (Table 2).

Overall, the two species most frequently recorded are the striped dolphin and the bottlenose dolphin, especially in countries like Spain, France, Italy. However, in the Mediterranean it is important to notice that some countries like Greece, Tunisia, Algeria, Israel, and Croatia do not follow this pattern, as there are more records of bottlenose dolphin than of striped dolphins. This could be explained by the kilometres of coast of these countries, and the coastal habitat of bottlenose dolphins compared to striped dolphins. In the other hand, the two Morbillivirus epizootic episodes that occurred in 1990 and 2007, especially affected populations of striped dolphins in Spain, France and Italy.

For the Black Sea three cetacean species: *D. delphis ponticus*, *T. truncatus aduncus* and *P. phocoena relicta* were reported by Bulgaria, Romania, and recently Ukraine.

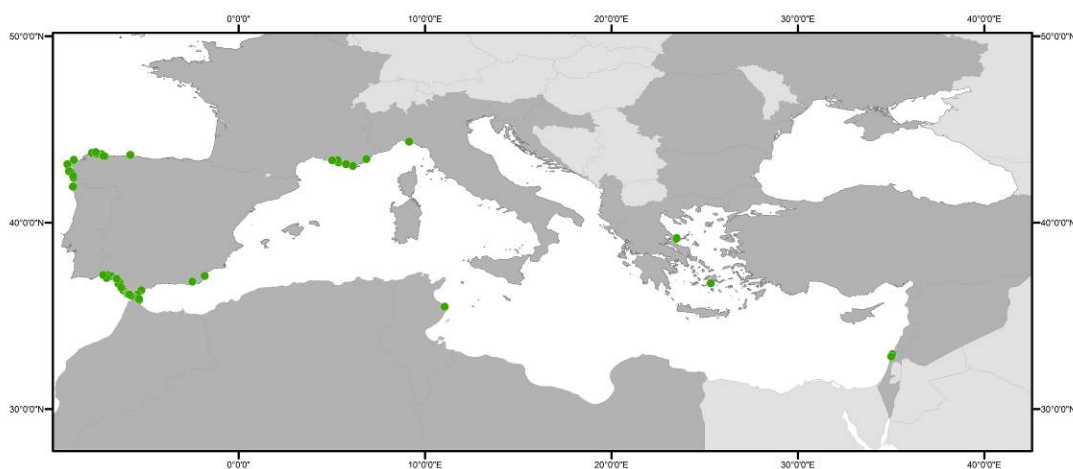
It must be taken into account the high number of harbour porpoises (more than 1100) that are registered stranded in MEDACES. This number could be comparable with the number of bottlenose dolphins and common dolphins stranded. Almost all records of harbour porpoises come from the Black Sea, with the exception of 131 stranded cases in Spain.

2.2.3. Distribution of the stranded species

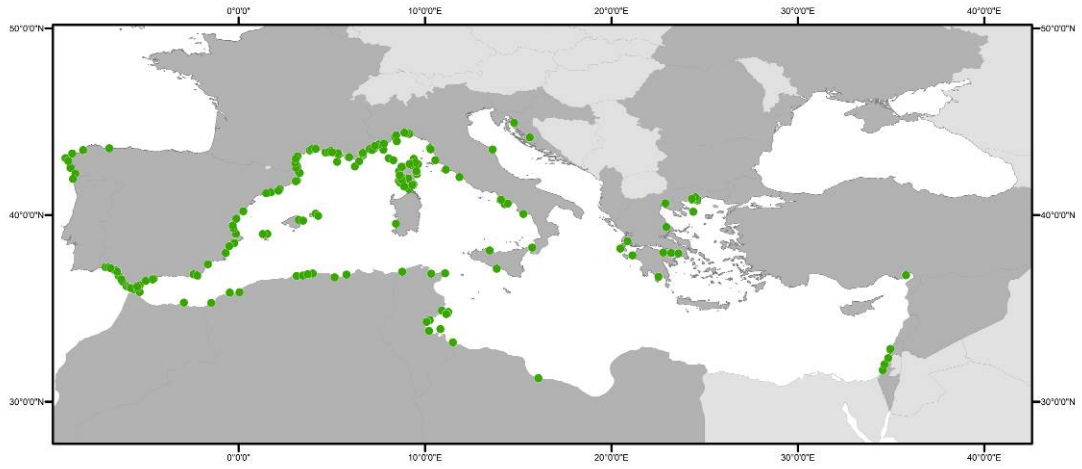
Not every species is uniformly distributed along the Mediterranean coast: strandings of *G. melas* are almost exclusive from the Western Mediterranean, whereas strandings of *D. delphis* are more abundant in the south of Spain (Alboran Sea) and in Greece. Strandings of other species have been reported occasionally in the Mediterranean: Sowerby's beaked whale (*Mesoplodon bidens*), humpback whale (*Megaptera novaeangliae*), killer whale (*Orcinus orca*), false killer whale (*Pseudorca crassidens*), dwarf sperm whale (*Kogia sima*), pygmy sperm whale (*Kogia breviceps*) and Blainville's beaked whale (*Mesoplodon densirostris*). Strandings of rough-toothed dolphin (*Steno bredanensis*) are not common in the Mediterranean basin but records seem to concentrate it in the Eastern Mediterranean (see Israel strandings). As the MEDACES database includes the adjoining Atlantic waters (South-Atlantic coast of Spain), strandings of several typically Atlantic species have been reported from this area, as minke whale (*Balaenoptera acutorostrata*) and harbour porpoise (*Phocoena phocoena*).

For the Black Sea (data from Bulgaria, Romania, and Ukraine), three cetacean species have been reported: *D. delphis ponticus*, *T. truncatus aduncus* and *P. phocoena relicta* (Figure 7). The latter species is the most frequently stranded in this region. Some strandings of this species occurred also in Mediterranean waters contiguous to the Black Sea (Northern Greek waters).

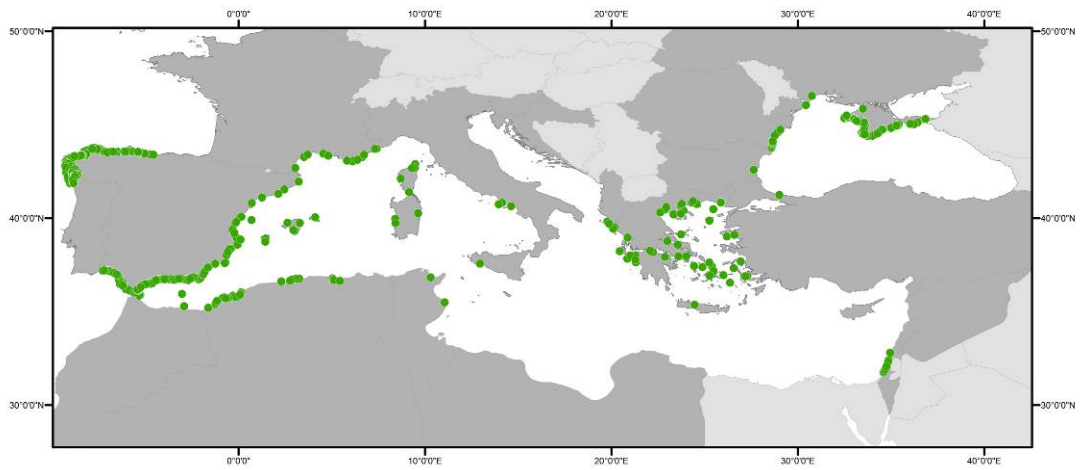
Balaenoptera acutorostrata



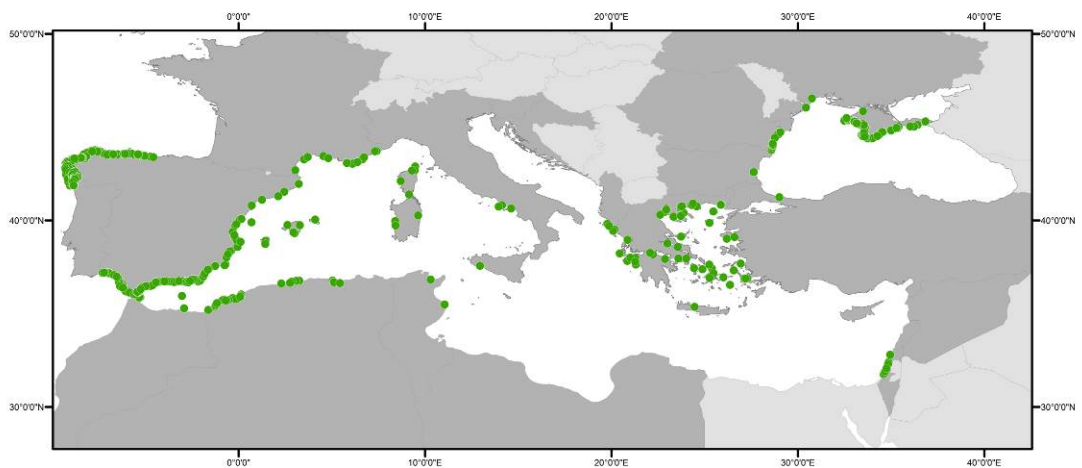
Balaenoptera physalus



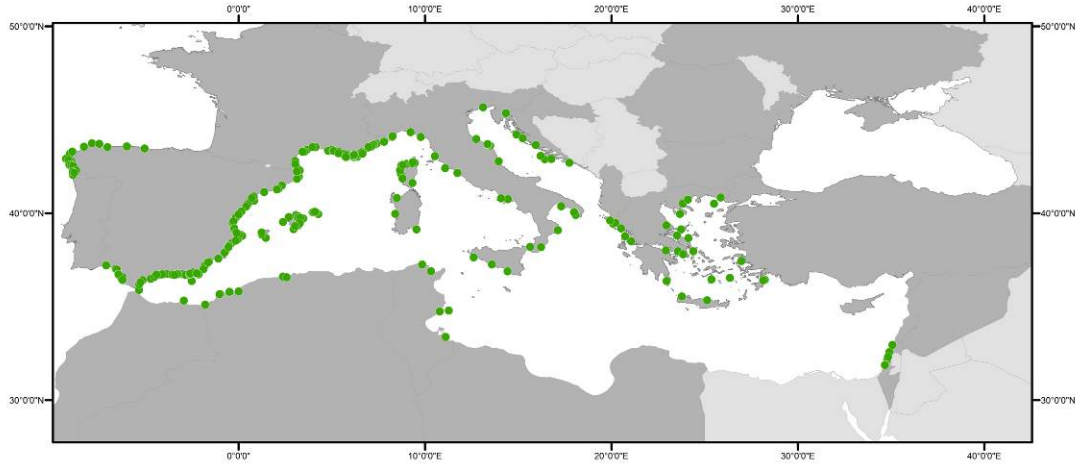
Delphinus delphis



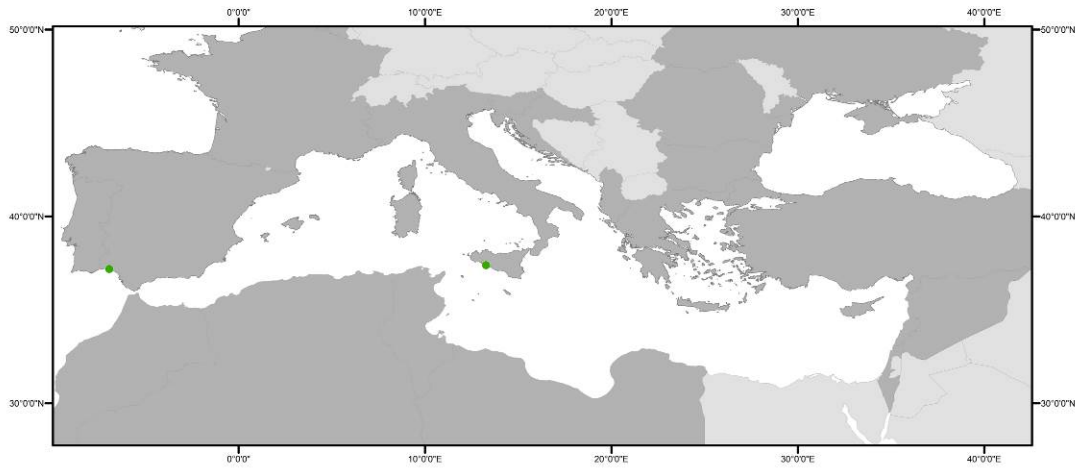
Globicephala melas



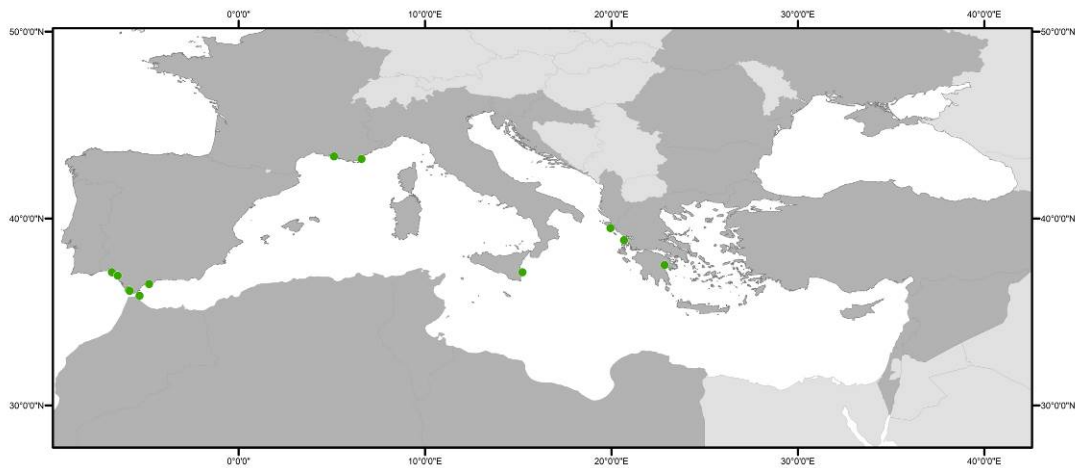
Grampus griseus



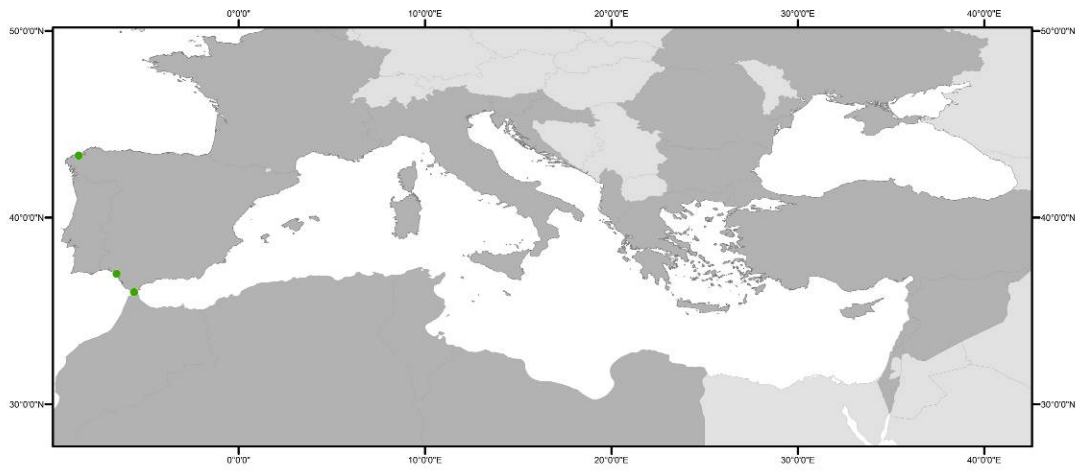
Kogia sima



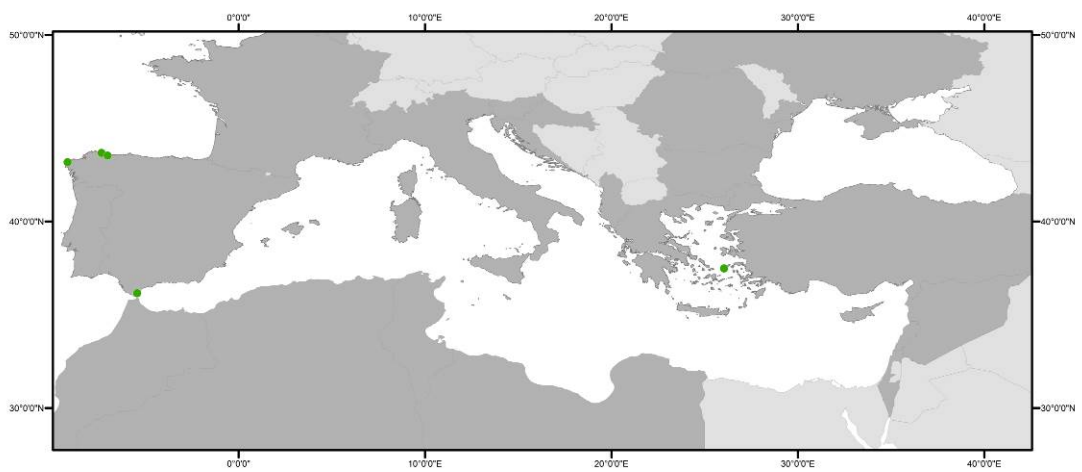
Megaptera novaengliae



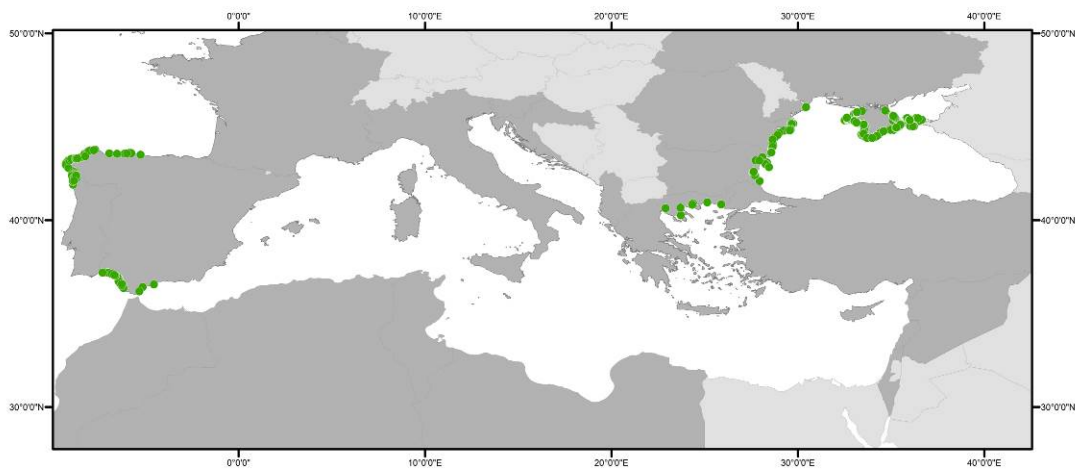
Mesoplodon densirostris



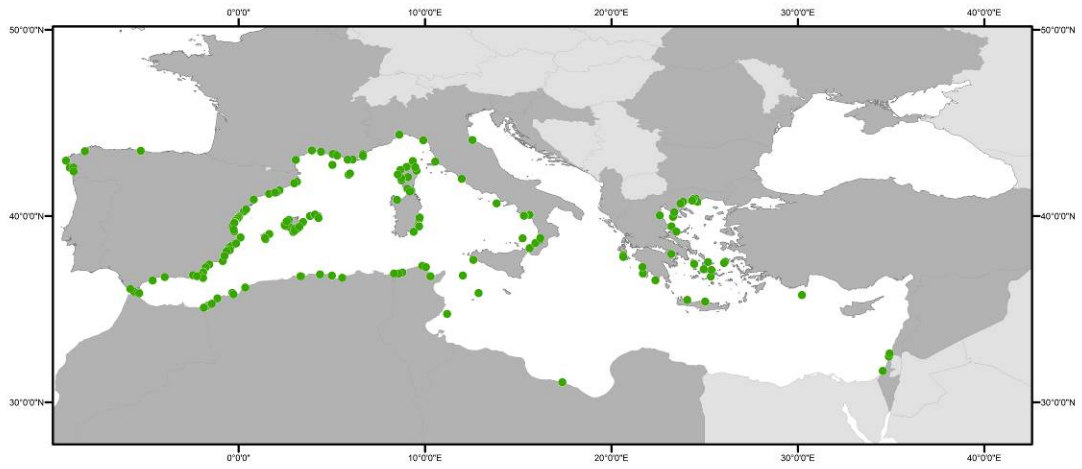
Orcinus orca



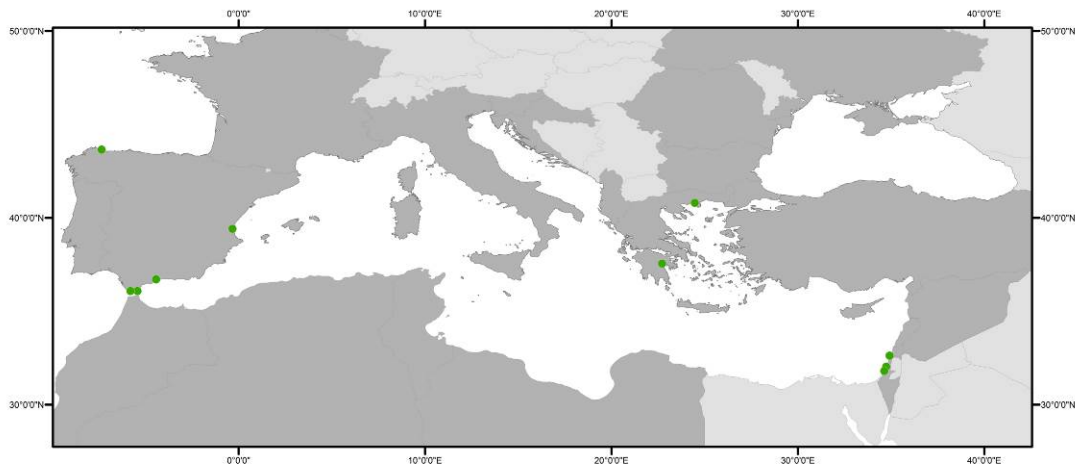
Phocoena phocoena



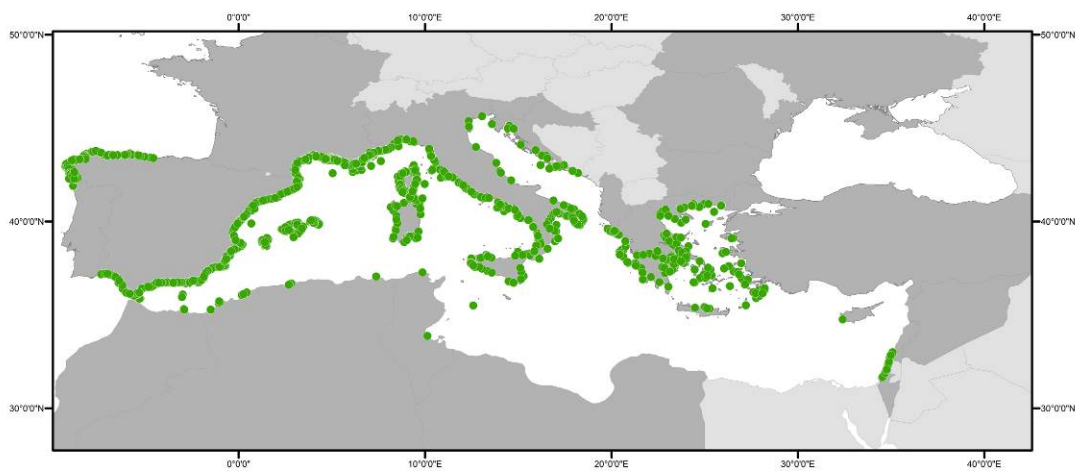
Physeter macrocephalus



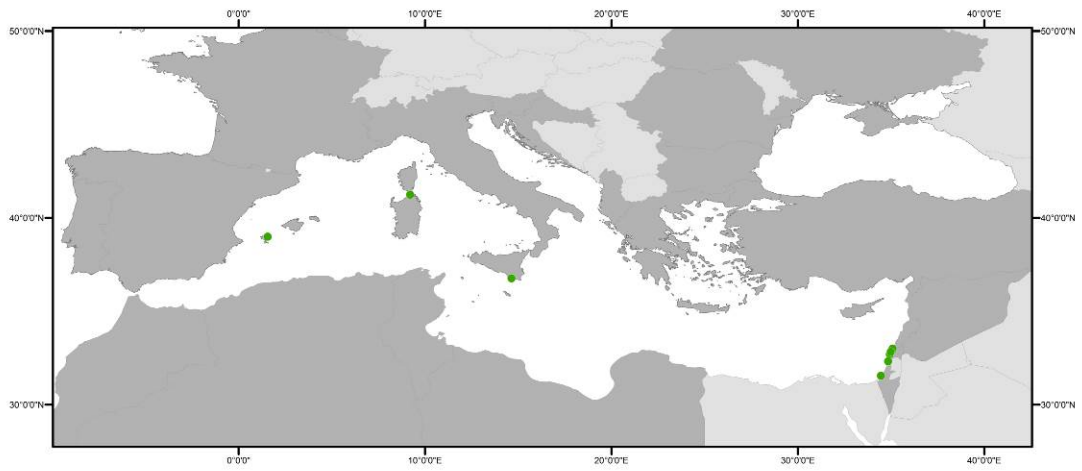
Pseudorca crassidens



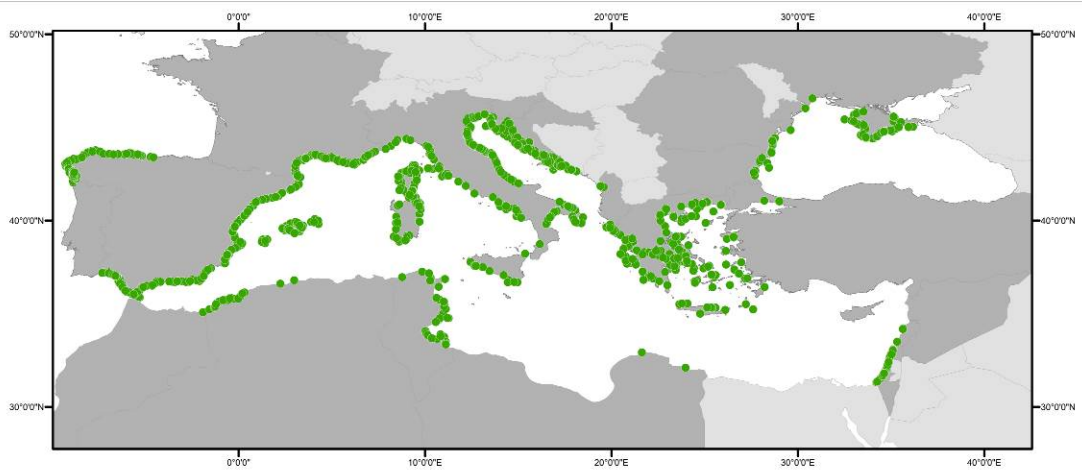
Stenella coeruleoalba



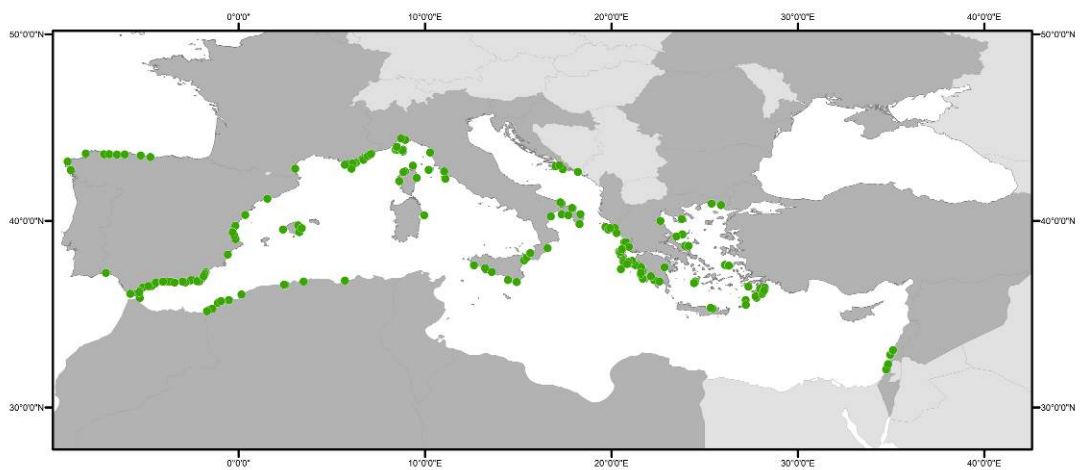
Steno bredanensis



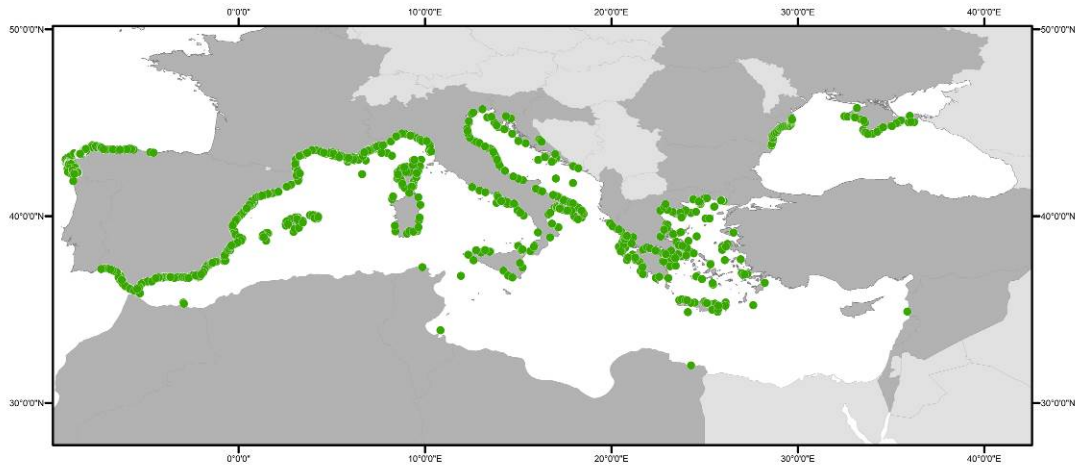
Tursiops truncatus



Ziphius cavirostris

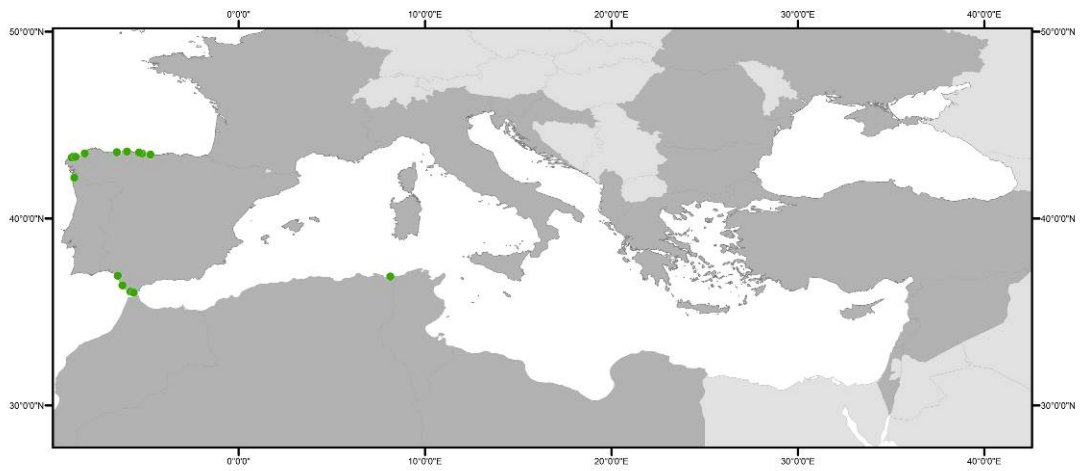


Unknown

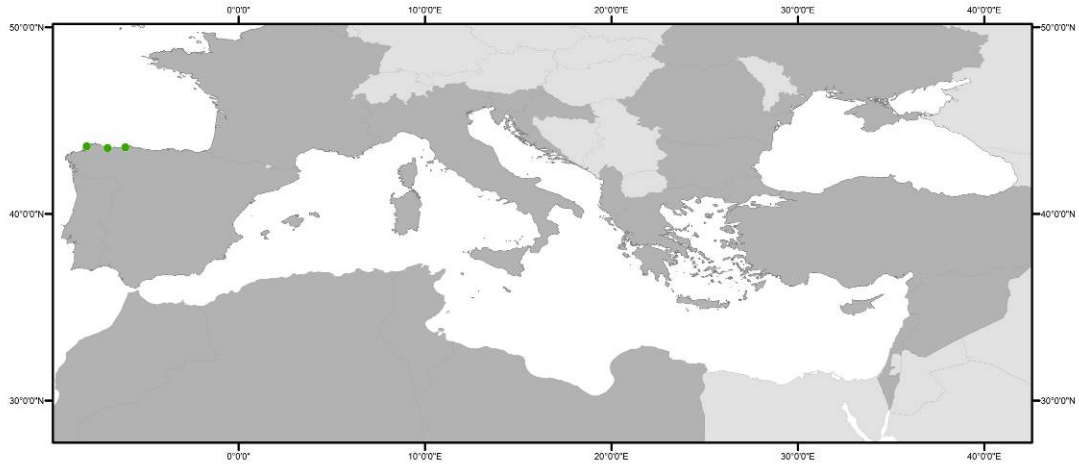


Others

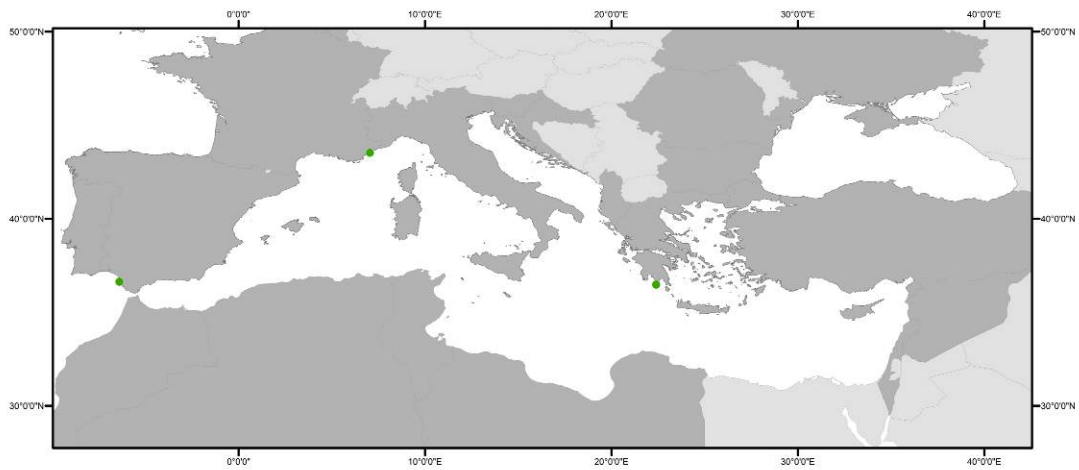
Kogia breviceps



Lagenorhynchus acutus



Mesoplodon bidens



Mesoplodon europaeus

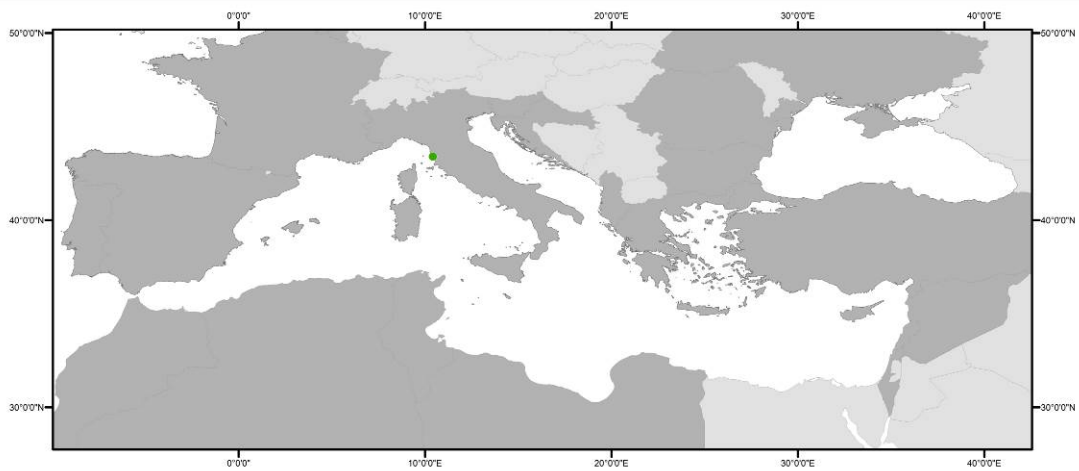


Figure 7. Each of the cetacean species strandings distributed along the coasts of each of the riparian countries of the Mediterranean and Black Seas.

2.2.4. Stranding rate

MEDACES would play an important role in detecting anomalies in the rate of cetacean strandings at the Mediterranean and Black Seas across time. However, this is only possible if the database is continuously updated with the latest information. To date, MEDACES has not been able to show general trends in the number of strandings, as there are still some gaps in the information. Only Croatia, France, Italy, Israel, and Spain seem to have complete stranding records from 1990 to 2010 in the Mediterranean, and Ukraine and Bulgaria for the Black Seas.

Table 3 shows the number of cetacean strandings of each species by year. No special trends are shown here. To evaluate if there is a trend along time for cetacean strandings in the Mediterranean we used the complete records across time given by Croatia, France, Italy, Israel, and Spain (Table 4).

Table 3. Number of strandings recorded for each cetacean species in all partner countries recorded by year. Ba, *Balaenoptera acutorostrata*; Bp, *Balaenoptera physalus*; Dd, *Delphinus delphis*; Gg, *Grampus griseus*; Gm, *Globicephala melas*; Ks, *Kogia Sima*; Md, *Mesoplodon densirostris*; Mn, *Megaptera novaengliae*; Oo, *Orcinus orca*; Pc, *Pseudorca crassidens*; Pm, *Physeter macrocephalus*; Pp, *Phocoena phocoena*; Sb, *Steno bredanensis*; Sc, *Stenella coeruleoalba*; Tt, *Tursiops truncatus*; Zc, *Ziphius cavirostris*, O, others; U, unknown.

	Ba	Bp	Dd	Gg	Mn	Gm	Ks	Md	Mn	Oo	Pm	Pc	Pp	Sb	Sc	Tt	U	Zc	total
2000	2	19	147	16	0	21	0	0	0	0	12	0	13	0	136	102	113	10	591
2001	7	7	126	22	1	20	0	0	0	0	12	1		1	192	198	133	14	744
2002	4	21	224	28	0	23	1	1	1	1	11	0	17	7	219	144	159	16	879
2003	11	10	224	17	0	20	1	1	0	0	8	10	19	2	309	151	169	7	960
2004	11	10	234	16	0	29	0	0	3	0	16	1	24	2	249	167	207	7	978
2005	12	15	244	27	0	43	0	0	0	1	22	12	0	0	218	164	207	16	982
2006	3	12	146	16	0	31	0	0	0	1	14	0	5	1	201	101	160	16	707
2007	12	15	244	27	0	43	0	0	0	1	22	0	12	0	218	164	207	16	943
2008	3	8	39	18	0	7	0	0	0	0	8	0	1	1	321	109	131	8	654
2009	0	8	28	12	0	10	0	0	0	0	7	7	0	0	207	58	49	3	420
2010	2	7	56	4		4	0	0	0	0	4	0	23	0	215	73	39	3	470
2011	0	3	54	14	2	14	0	1	0	0	6	0	5	0	249	62	26	4	498
2012			10	1							2	2	6		27	24	11	3	86

Table 4. Number of cetacean strandings by year from Croatia, France, Israel, Italy and Spain. These countries have a continuous record in the Mediterranean.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
<i>Balaenoptera acutorostrata</i>	2	7	4	11	11	12	3	4	3	0	2	0	0
<i>Balaenoptera physalus</i>	19	7	21	10	10	15	12	18	8	7	7	3	0
<i>Delphinus delphis</i>	147	126	229	239	239	249	158	138	41	51	63	54	12
<i>Grampus griseus</i>	16	22	28	17	16	27	16	18	18	12	4	14	1
<i>Globicephala melas</i>	21	20	23	20	29	43	31	60	7	10	4	14	2
<i>Physeter macrocephalus</i>	12	12	11	8	16	22	14	16	8	7	4	6	0
<i>Phocoena phocoena</i>	13	6	47	162	51	53	104	23	33	22	43	5	6
<i>Stenella coeruleoalba</i>	136	192	219	309	249	218	201	416	321	207	215	249	27
<i>Tursiops truncatus</i>	102	200	165	174	180	187	120	115	116	67	80	62	24
Unknown	113	133	180	205	214	207	243	143	135	49	39	26	11
<i>Ziphius cavirostris</i>	10	14	16	7		16	16	11	8	0	3	4	3

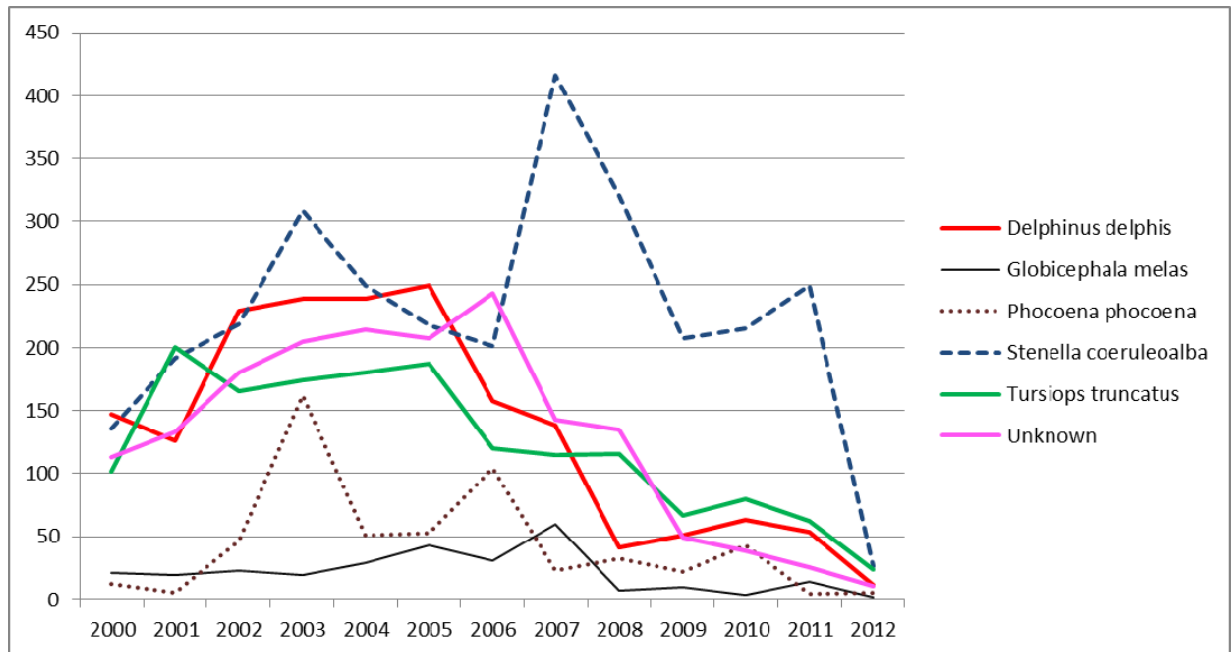


Figure 8. Number of strandings of the main cetacean species in the countries that have a complete record from 2000 to 2012.

Even though the total number of strandings does not show trends along time due to the lack of data in some years, we use the complete dataset given by Croatia, France, Israel, Italy and Spain to look for trends and there are some relevant points that could be extracted from these stranding rates in the Mediterranean presented in table 4 and Figure 8:

- The number of Unknown cetacean species has decreased, probably due to the use of new technologies in the identification of the species carcasses by pictures.
- The majority of the species show a constant pattern of strandings along the years.
- The number of striped dolphin stranded was significantly higher in 2007 and 2008, due to the mortality caused by the Morbillivirus infection.
- The number of pilot whales, common dolphins and harbour porpoises strandings seem to have decreased in the last year. Special attention should be paid to this point.
- The number of pilot whale strandings showed an increase in 2007 and 2008, due to the mortality caused by the Morbillivirus infection.

3. COMMENTS/RECOMMENDATIONS

- The MEDACES web-page plays a very important role for the fulfilment of the following objectives: 1) To collect the stranding information of cetaceans from all the collaborating countries in a unique database; 2) To provide access to the different information that has been collected from each stranded animal; 3) To facilitate the contact information among people and institutions working on cetacean biology and conservation at the Mediterranean and Black Seas. The database joins also information about the organizations/institutions collaborating with MEDACES, including data of contact-persons. Hence, MEDACES makes the cetacean stranding information available to everyone interested in cetaceans (although submitted data are protected by a Deontological Code).
- During 2012, MEDACES has been updated with the data sent by different institutions, Israel, Bulgaria, Lybia and Spain.
- Since the 2013 RAC-SPA initiative, some countries have collaborated sending stranding data in order to update MEDACES, and others have shown their willing to contribute. This step is important in order to make MEDACES a useful tool for researchers.
- The way of sending data to MEDACES has been developed in the last years. More simple data forms have been used in order to make easier the collection of data from the different institutions.
- More contacts have been made from MEDACES, ACCOBAMS and RAC/SPA to encourage the different countries around the Mediterranean and Black Sea to collaborate with the database. But still, in every riparian country wishing to collaborate, the different National Focal Points should increase the support to the national organizations and institutions working in stranding networks. This should be conducted through the RAC/SPA or/and ACCOBAMS.
- Data analyses presented in this report have identified the occurrence of abnormal stranding rates in the Mediterranean in recent years. Several species has been affected: striped dolphins, common dolphins, harbour porpoises and bottlenose dolphins. It would be very interesting to follow up on these observations in order to test for possible infections or an increase in human interactions.

- The fact that this kind of events can be reflected through the MEDACES web page is an opportunity for scientists as well as for competent members of the different governments of the riparian countries, to set up an emergency protocol to anticipate a possible die-off. In addition, standardized methods for necropsies and tissue sampling, as well as coordination procedures can be prepared. MEDACES is also providing contact information about relevant scientists and institutions, allowing fast and easy exchange of experience and advices.

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