COMENIUS MULTILATERAL PROJECT

MARE NOSTRUM

5TH MOBILITY

16TH - 20TH MARCH 2015

LISBOA – PORTUGAL

ESCOLA E.B. 2,3 PISCINAS-LISBOA

WHAT WE GET FROM THE SEA

PORTUGAL AND THE SEA

- Portugal, a country with a long maritime tradition.
  - Middle Ages:
    - Fishing expansion;
    - Naval building development;
    - Sea guidance evolution;
    - Discoveries;
  - 18th centuries:
    - Creation of the Royal Fishing Company of the Kingdom of the Algarve;
    - Codfish fishing with no taxes;
    - Harbours improvements.

PORTUGAL AND THE SEA

- 19TH CENTURY:
  - The first preserved food was created; canned tuna;

- Late 19th century / beginning of the 20th century;
  - Development of the canned industry.

- 21st century:
  - The sardine and tuna industry started to diminish.

PORTUGAL AND THE SEA

- The Sea is a main area for many reasons:
  - Political;
  - Economic;
  - Social;
  - Scientific;
  - Cultural;
  - Tourism;
  - Leisure.

The Ocean generates jobs and is one of the promoters of the country´s economy:

- Means of communication;
- Means of navigation;
- Food sources;
- Medicine sources;
- Energy sources;
- **Life resources**;
- Wellbeing and quality of life source;
- Leisure and sports activities.

The Portuguese Coast

- Continental Portugal is 943 km along its coast, 667 km in the Azores, 250 km in Madeira Island. There we can include *Ilhas Desertas* and *Ilhas Selvagens* – protected areas.
- The coast offers beautiful islands with white sand.
- Madeira and the Azores archipelagos which are geographically different offer great biodiversity.
- The Portuguese maritime fauna is extremely different and is one of the country´s biggest wealth.


odiversity in the Portuguese Sea


Fish

Tuna - Thunnus thynnus

- Only the biggest fish are caught.
- They feed on small fish, crustacean and squid.
- There are some underwater cages in the Mediterranean Sea where some of these species get fat to enter the sushi market.
- The biggest fish weighs more than one ton and is more than 4 metres long.

Tuna - Thunnus thynnus

- The three **Thunnus thynnus** species exist in every ocean and sea except in polar waters.
- **Thunnus thynnus** has an ancient relationship with Mankind.
- Japanes fishermen have been capturing this type of tuna in the Pacific Ocean for more than 5000 years.

Tuna - Thunnus thynnus

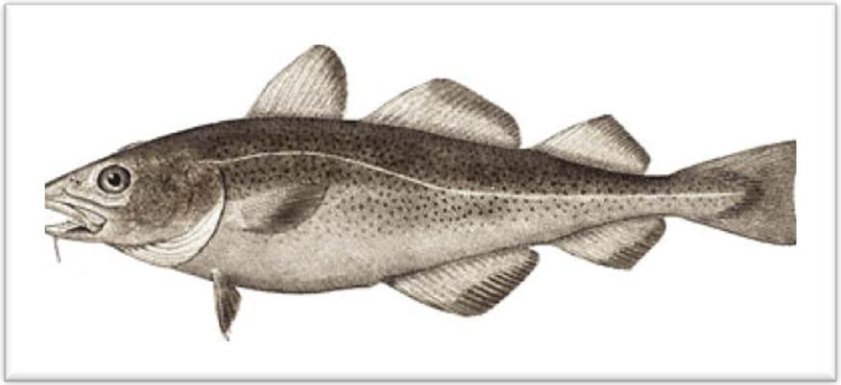
Nowadays Japonese people buy this type of tuna in Portugal.

Migrações épicas do atum-rabilho

Os atuns-rabilhos são peixes migratórios, atravessando os mares de todo o mundo em ciclos anuais de desova e alimentação. Pelo menos dois grupos partilham o Atlântico. Um desova no golfo do México e o outro no Mediterrâneo. Os grupos convivem no centro do oceano. Alguns peixes até passam anos do lado do oceano oposto àquele onde desovam.

- Common Portuguese Name: Atum
- Common English Mane: Tuna
- Scientific Name:*Thunnus thynnus*

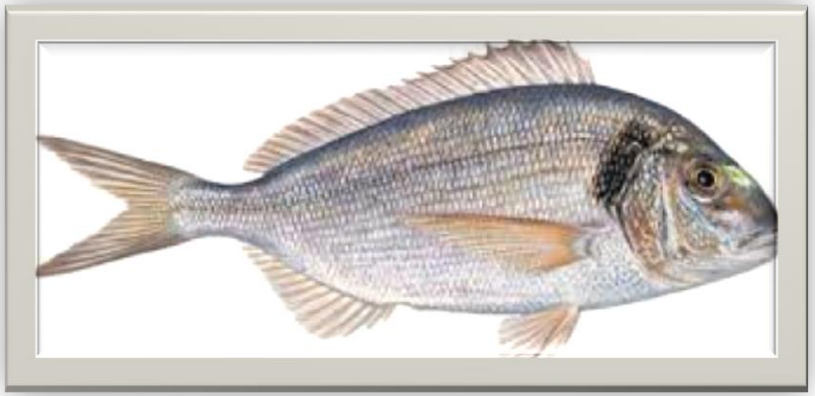
- Common Portuguese Name: Bacalhau
- Common English Name: Codfish
- Scientific Name: *Gadus morhua*



- Common Portuguese Name: Sardinha
- Common English Name: Sardine
- In the Azores we can find two species of sardines: *Sardinella maderensis e Sardina pilchardus*.

- Common Portuguese Name: Carapau
- Common English Name: Horse Mackerel
- Scientific Name: Trachurus trachurus

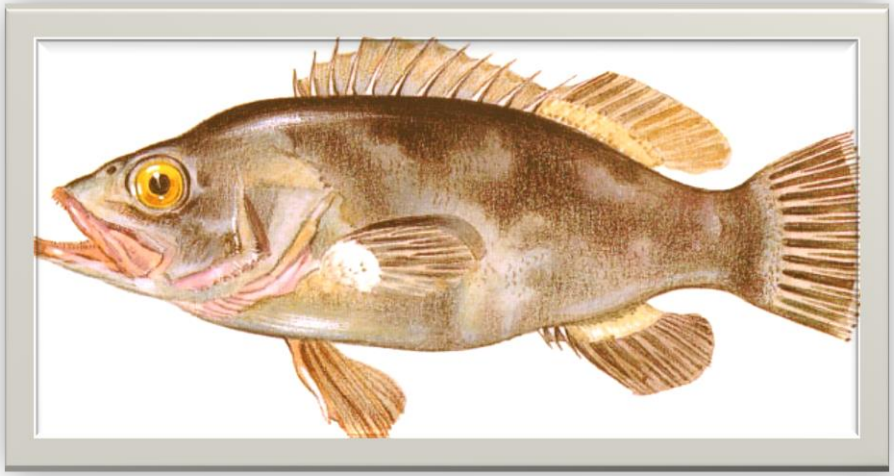
- Common Portuguese Name: Dourada
- Common English Name: Gilt-head bream
- Scientific Name: Spaurus aurata



- Common Portuguese Name: Robalo
- Common English Name: Bass
- Scientific Name: Dicentrarchus labrax

- Common Portuguese Name: Cavala
- Common English Name: Mackerel
- Scientific Name: *Scomber Colias*

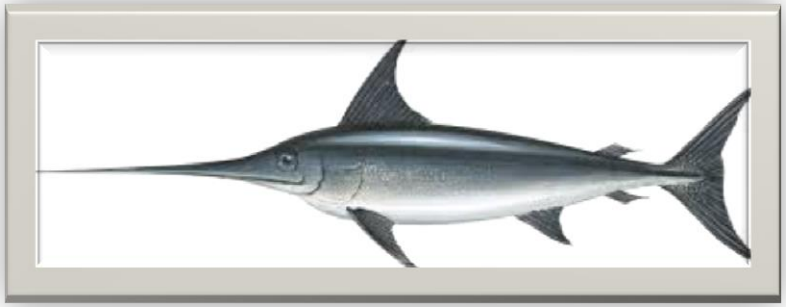
- Common Portuguese Name: Cherne
- Common English Name: Wreckfish
- Scientific Name: Polyprion americanus



- Common Portuguese Name: Congro
- Common English Name: Conger
- Scientific Name: Conger conger

- Common Portuguese Name: Corvina
- Common English Name: Meagre
- Scientific Name: Argyrosomus regius

- Common Portuguese Name: Espadarte
- Common English Name: Swordfish
- Scientific Name: Xiphias gladius



- Common Portuguese Name: Goraz
- Common English Name: Blackspot seabream
- Scientific Name: Pagellus bogaraveo

- Common Portuguese Name: Linguado
- Common English Name: Sole
- Scientific Name: Solea solea

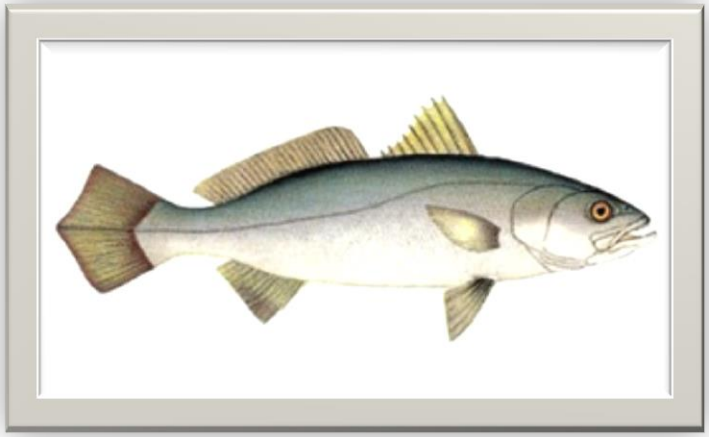
- Common Portuguese Name: Pargo
- Common English Name: Red porgy
- Scientific Name: Pagrus pagrus

- Common Portuguese Name: Peixe-espada-preto
- Common English Name: Black scabbardfish
- Scientific Name: Aphanopus carbo

- Common Portuguese Name: Peixe-galo
- Common English Name: John Dory
- Scientific Name: Zeus faber

- Common Portuguese Name: Cantarilho
- Common English Name: Bluemouth
- Scientific Name: Helicolenus dactylopterus

- Common Portuguese Name: Pescada-branca
- Common English Name: European hake
- Scientific Name: Merluccius merluccius



- Common Portuguese Name: Salmonete
- Common English Name: Red mullet
- Scientific Name: Mullus surmuletus

- Common Portuguese Name: Tamboril
- Common English Name: Monkfish
- Scientific Name: Lophius piscatorius

- Common Portuguese Name: Sargo
- Common English Name: White seapream
- Scientific Name: Diplotus sargus

Cephalopods

- Common Portuguese Name: Choco
- Common English Name: Cuttlefish
- Scientific Name: Sepia officinalis

- Common Portuguese Name: Lula
- Common English Name: squid
- Scientific Name: Loligo vulgaris

- Common Portuguese Name: Polvo-comum
- Common English Name: Common octopus
- Scientific Name: Octopus vulgaris


Bivalves

- Common Portuguese Name: Amêijoa-boa
- Common English Name: Groovet Carpet shell
- Scientific Name: Rutitapes tecussatus

- Common Portuguese Name: Mexilhão
- Common English Name: Blue mussel
- Scientific Name: Mytilus edulis; Mytilus galloprovinciales.

- Common Portuguese Name: Ostra
- Common English Name: Oyster
- Scientific Name: Crassostrea spp

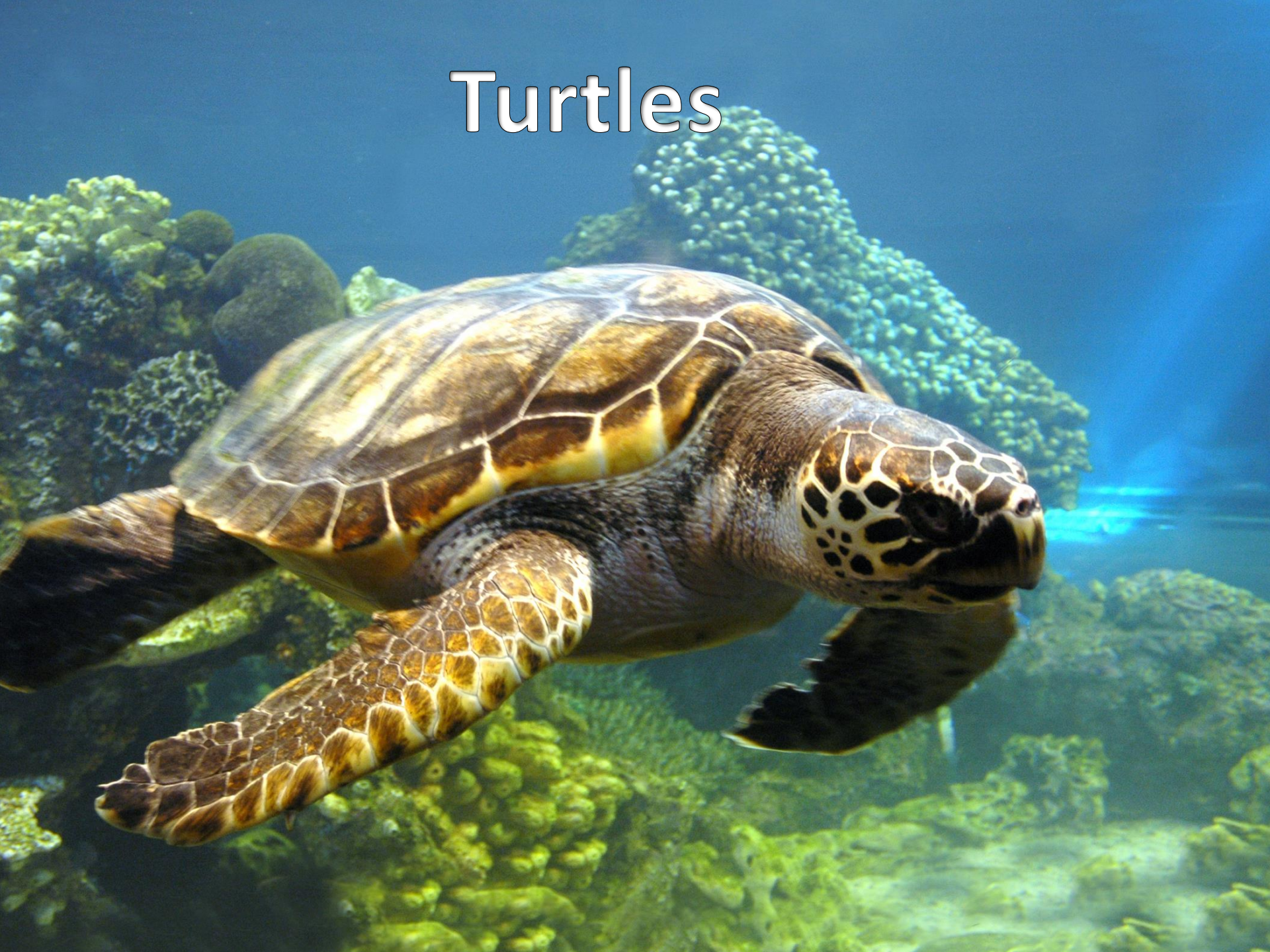
Crustaceans

- Common Portuguese Name: Navalheira
- Common English Name: Swimcrab
- Scientific Name: Necora puber

- Common Portuguese Name: Santola
- Common English Name: Spider crab
- Scientific Name: Maja Squinado

- Common Portuguese Name: Sapateira
- Common English Name: Ediple crab
- Scientific Name: Cancer pagurus

Turtles



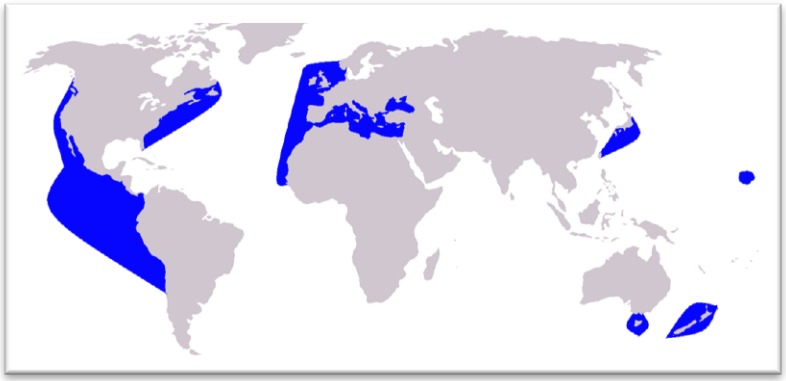
- Common Portuguese Name: Tartaruga-comum
- Common English Name:Common turtle
- Scientific Name: Caretta caretta

Aquatic mammals

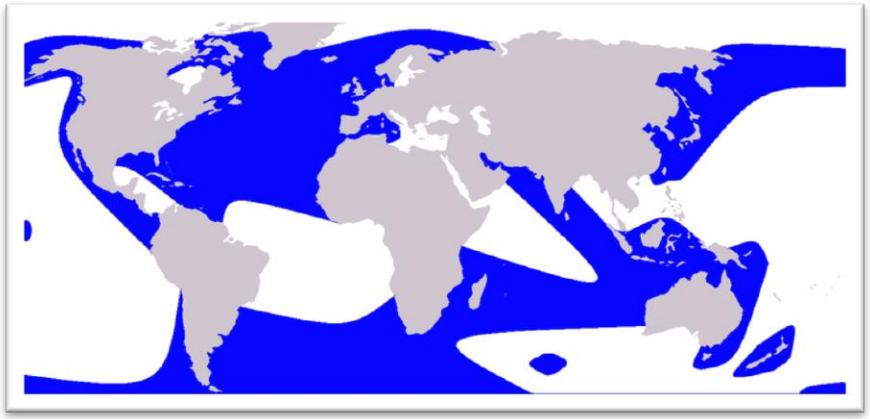
- Common Portuguese Name: Cachalote
- Common English Name: sperm whale or cachalot
- Scientific Name: Physeter macrocephalus

- Common Portuguese Name: Baleia Corcunda
- Common English Name: Humpback whale
- Scientific Name: Megaptera novaeangliae

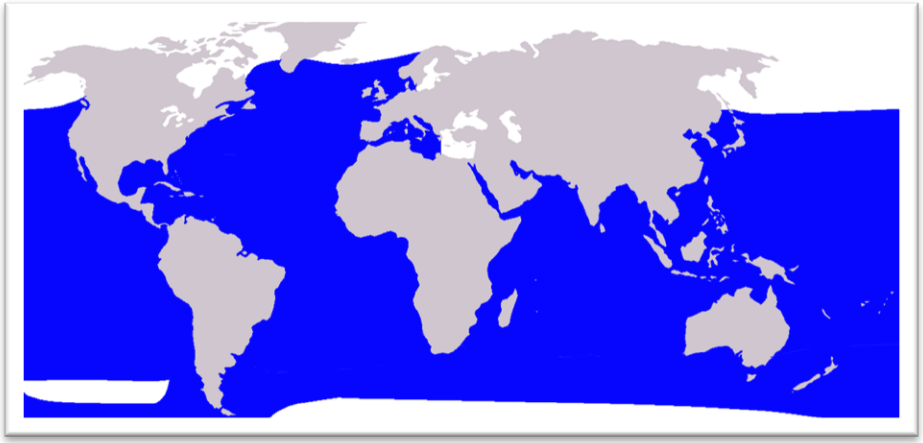
- Common Portuguese Name: Golfinho
- Common English Name: Dolphin
- Scientific Name: Delphinus dephis

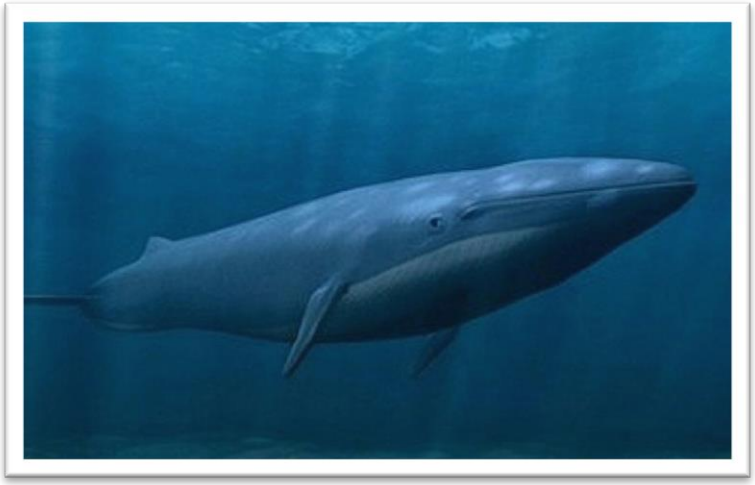


- Common Portuguese Name: Orca
- Common English Name: Killer Whale
- Scientific Name: Orcinus orca

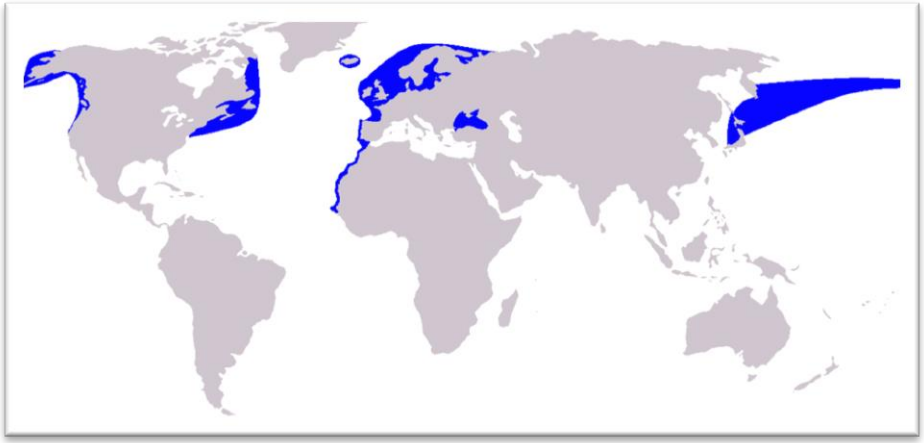


- Common Portuguese Name: Baleia Azul
- Common English Name: Blue whale
- Scientific Name: Baleonoptere



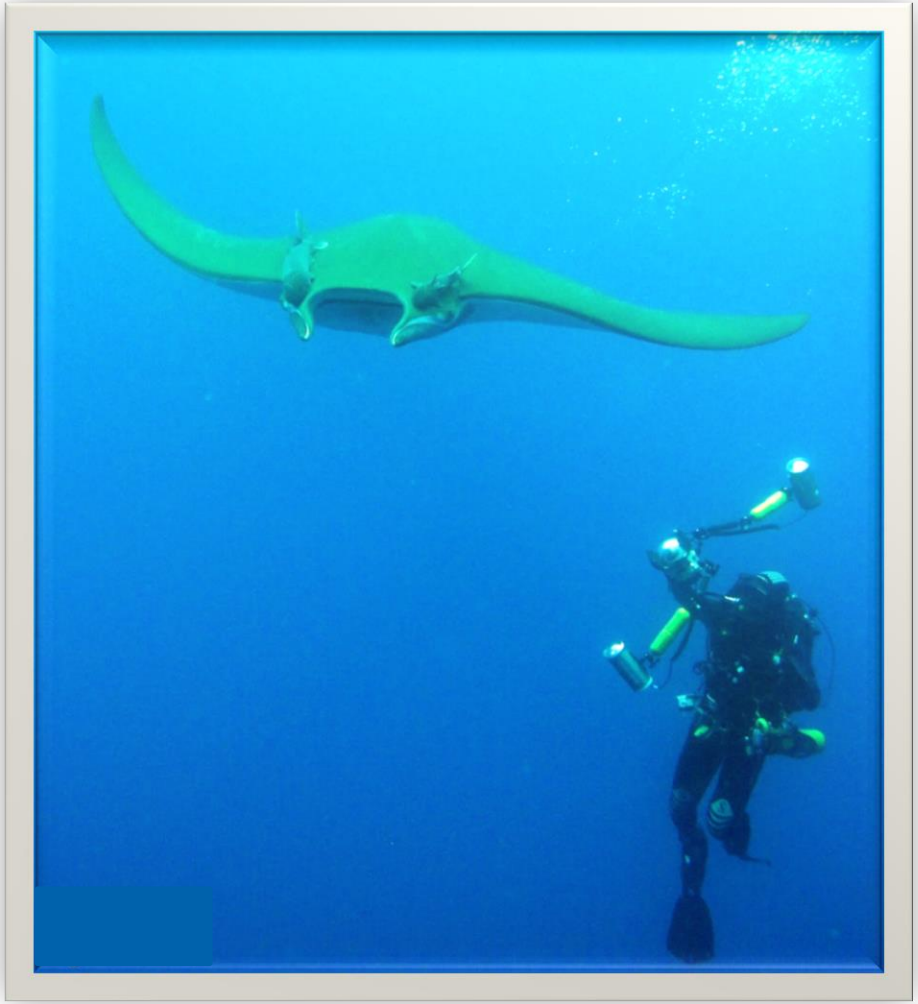


- Common Portuguese Name: Botos
- Common English Name: Boto
- Scientific Name: Phocoena phocoena



Azores Devilrays

- Devilrays used to be known as devils of the sea due to their huge size. They originated legends that talked about aggressive giants who swallowed seamen and boats, so masking the nature of these filtrators which feed on plankton and small fish, as other sea giants do, such as the blue whale or the shark whale.



Azores Devilrays

- Every summer they get together in the underwater mountains of the Azores;
- Their ecology still remains a mystery to science;
- This magnificent species goes on being an enigma:
  - Where do they go when the calm hot waters of the archipelago become wild?

Azores Devilrays

- Their fins have a span of almost three metres. They move slowly using their imponent chest fins, which are similar to enormous wings what makes them look like they are flying underwater.

Azores Devilrays

- *Mobula tarapacana* appears frequently in the Azores.
- It is a cartilagenious fish, just like sharks and devilrays which means they don´t have bones. While common rays live near the Portuguese coast, devilrays live in the open ocean not at the bottom of the sea.
- There are 11 species, including the enormous *Manta birostris*, which is common but less frequent and can be more than 6 or 7 metres wide and weigh more than 1 ton.

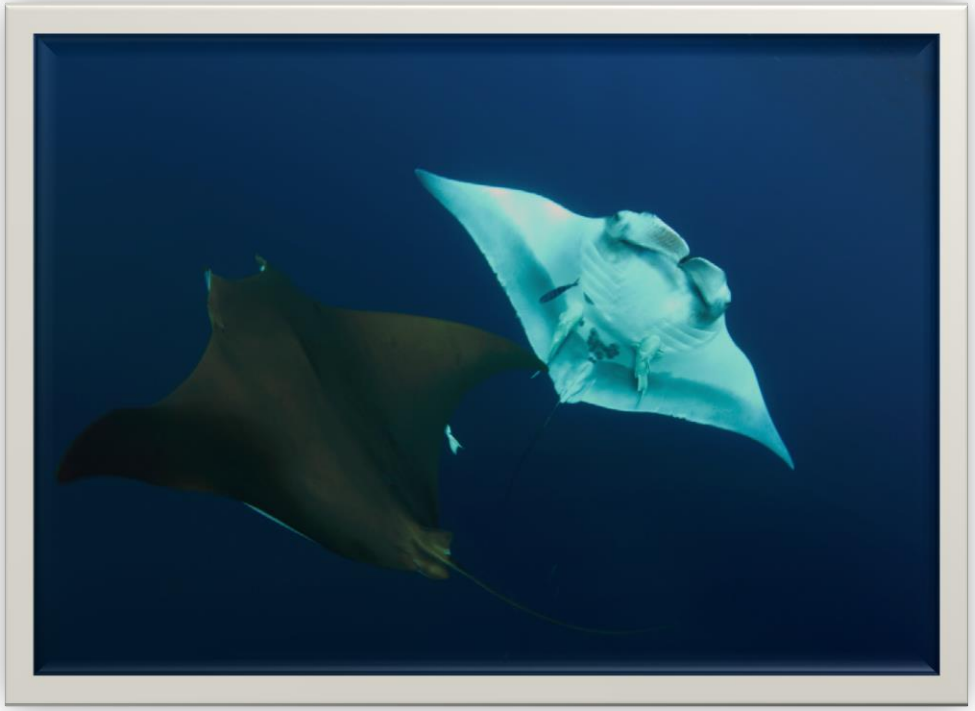
Azores Devilrays

- In the Azores, in Princess Alice´s shore, Portuguese scientists unveil the secrets of their ecology.

These magnificent and lovely animals atract divers and recreational photographers from all over the world.

Azores Devilrays

- In order to monitor these animals´behaviour scientists have created transmiters as well as a project of photo identification of this species.



- Five months after being attached to their bodies the transmiters get loose and come to the surface, thus giving information about the type of diving, anatomy and behaviour of these animals.

Azores Devilrays

At the Oceanography and Fishing Department (OFD), researchers got to know that devilrays dive very rapidly and are able to dive below 1,000 metres, where they resist smashing pression, darkness and low temperatures.

This can only be achieved due to an organ which is located in their skull and chest fins which allows heat to be generated no matter the temperature of the water where they swim. “Perhaps we have found their real function”, says on of the OFD investigators.

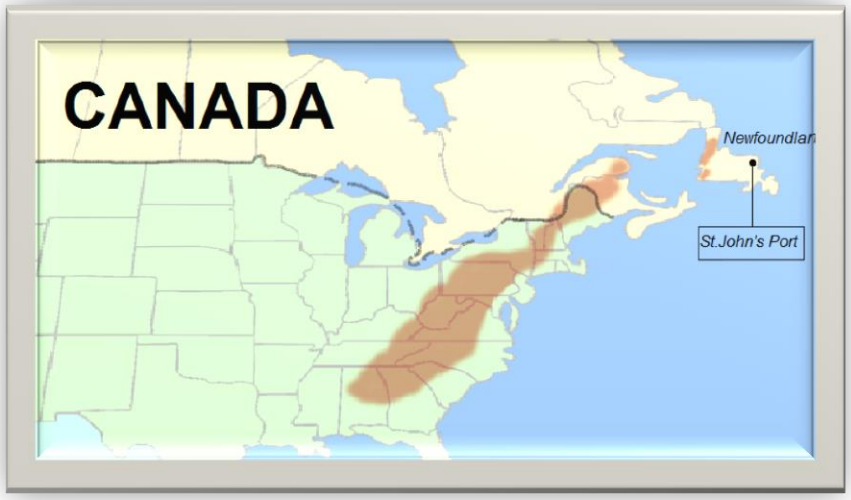
Azores Devilrays

- There has been an increase in the number of devilrays caught.
- As they have a diminished fertility rate and are caught in excess, it is difficult to level the population of devilrays what makes their number decrease.
- The trading of products related to the most threatened species has been conditioned.
- The income generated by recreational diving has been increasing. That will allow the necessary efforts to protect the species.

Codfish fishing in New Found Land

By the end of the 15th century Europe was under a harsh Catholic Curch which prohibited meat two days in the week. Therefore, the quest for fish started, what made the Iberian waters scarce for such great demand of fish.

In 1497, Giovanni Caboto left Bristol under the British Empire, convinced that if he went west he would arrive in Asia quicklier. In reality he got to New Found Land.



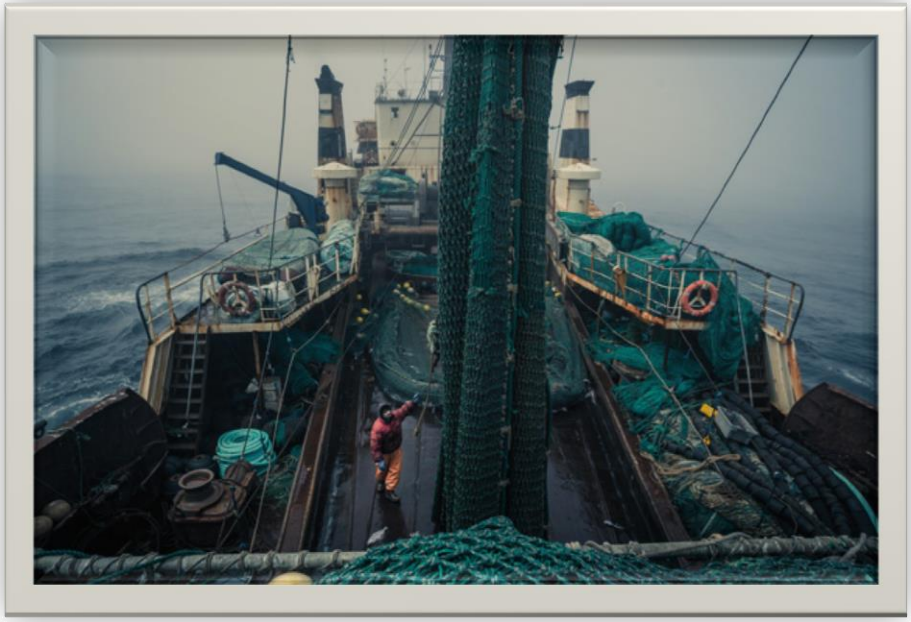
History of cod fishing in New Found Land

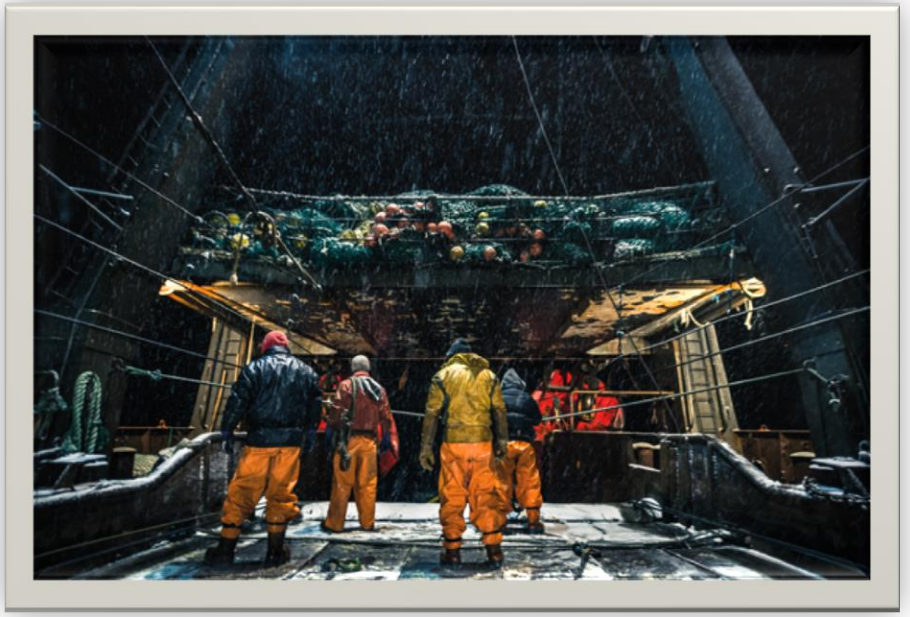
For centuries the white fleet, as the Portuguese fleet of codfish vessels was known took advantage of the eastern winds of spring to sail to New Found Land to fish the cod.

More than 2,000 miles from home men fished for many months undergoing unthinkable conditions.

History of cod fishing in New Found Land

By the end of the first half of the 20th century the Portuguese codfish fleet started to change gradually. The sailing boats were replaced by engine vessels. Distant fishing entered a new phase, more industrial and massive in which the hook and the rod gave way to a fishing trawl equipment.





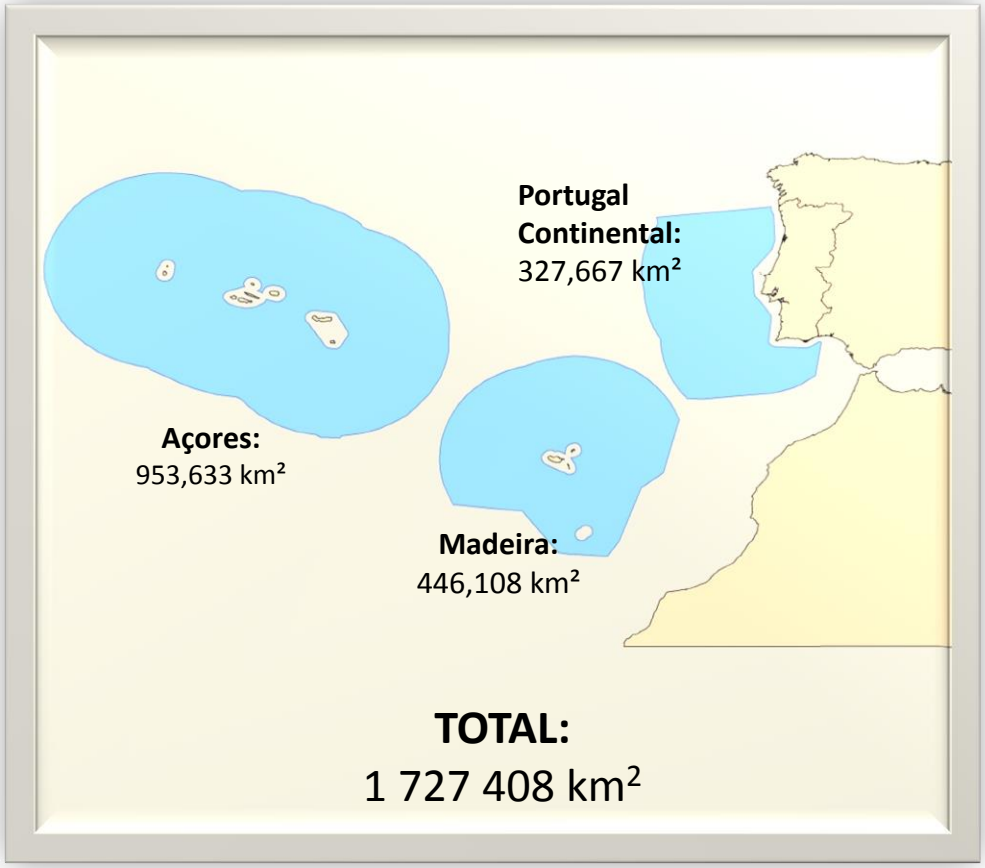
Nowadays…

- Portuguese codfish boats do around two voyages a year – a total of 8 months.
- Fishermen are poorly paid, no matter the risks they are exposed to.
- Tradition in consuming cod, being proud of their ancestors and in the 500 years of history of going to New Found Land are, for many, the reasons that lead them to go on sailing year after year.

- Today, codfish boats fish lots of other different species.

The Portuguese Exclusive Economic Area (PEEA)

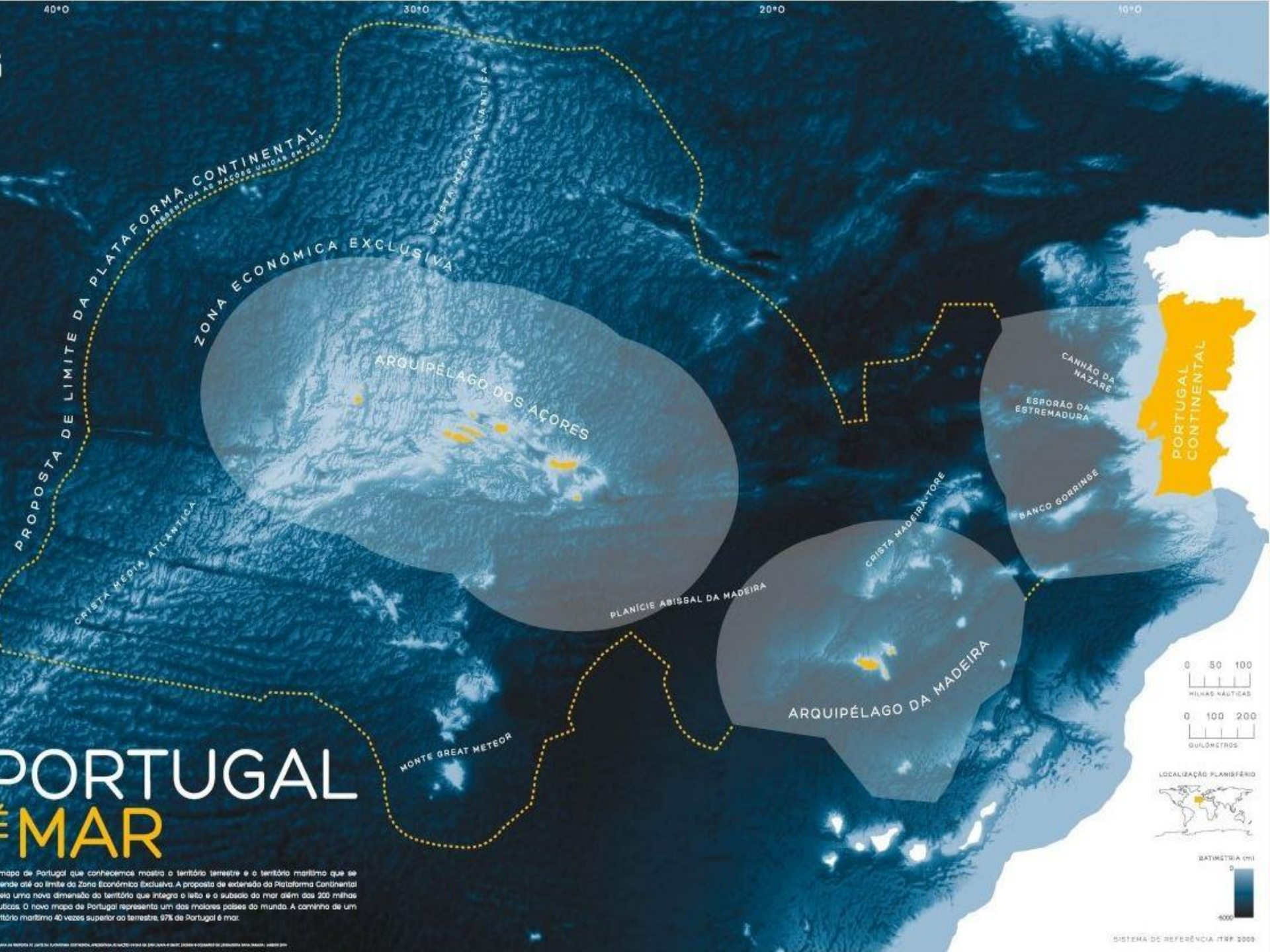
- The PEEA determines the maritime area under the responsibility and organization of each country.
- Portugal masters the 3rd biggest Exclusive Economic Area of the EU and is the 11 th worldwwide. It has 1 727 408 km² geographically speaking which corresponds to 1.25% of the whole oceanic area under the countries´ jurisdiction.



- EMEPC - SCPEM – Structure for Continental Platform Extension Mission – was given as mission to prepare a proposal to extend the Portuguese continental platform beyond 200 maritime miles.
- The goals of this mission were set in 2004, presented in 2009 and the result of the research will be known between 2013/2020, in the European Union.

EMEPC - SCPEM Objectives

- To know the geologichal and hydrographic characterisitics of the Portuguese coastal sea bottom and those of Madeira Island and the Azores in order to justify the Portuguese aim to widening the limits of the Continental Platform by 200 maritime miles;
- To define the limits of the Portuguese Continental Platform to submit to the Continental Platform Limits Commission;
- To create a dictionary of oceanic data and to prepare the structure that will serve as the basis to support the Continental Extension Platform. Thus it will be able to serve a system of monitorization of the ocean in the future;
- To promote the development of research projects to deal with the results obtained with the data given by CPEP;
- To reinforce the national scientific body with PhDs related to CPEP, namely computurized geographical, geologic, geophysics and international legal rights;
- To promote editing a data atlas containing data and information from CPEP;
- To support the preparation of proposals issued by other continental governments in order to extend their continental Platforms in accordance to the Portuguese government;
- To attract the involvment of young students and researches in the CPEP;



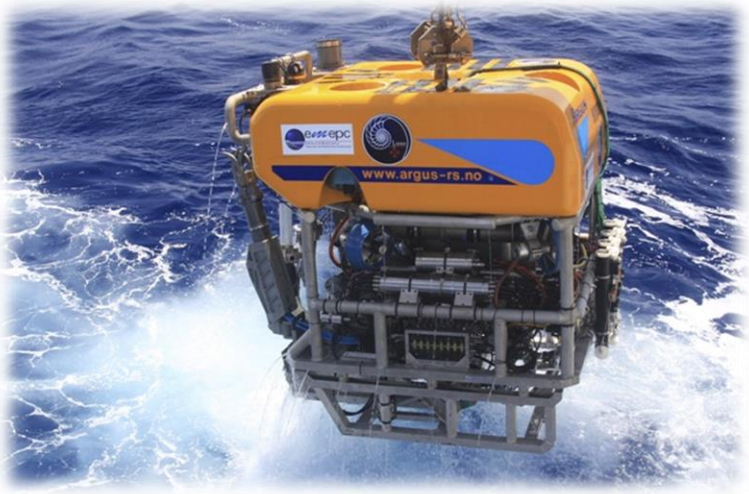
PORTUGAL É MAR

O mapa de Portugal que conhecemos mostra o território terrestre e o território marítimo que se estende até ao limite da Zona Económica Exclusiva. A proposta de extensão da Plataforma Continental revela uma nova dimensão do território que integra o leito e o subsolo do mar além das 200 milhas náuticas. O novo mapa de Portugal representa um dos maiores países do mundo. A caminho de um território marítimo 40 vezes superior ao terrestre, 97% de Portugal é mar.

O ROV LUSO

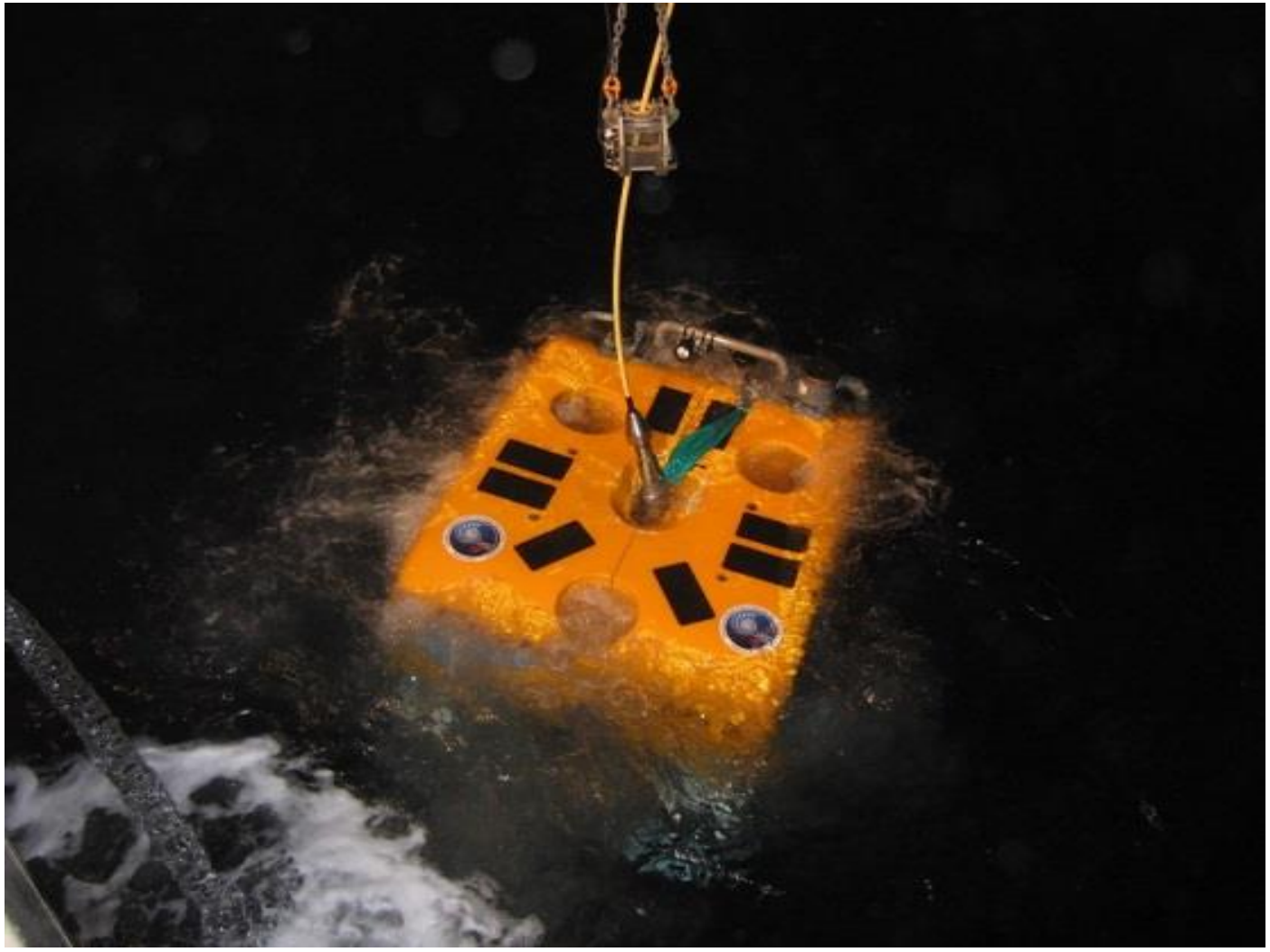
ROV Luso, acquired by Portugal due to the extension of the SCPEM Platform in 2008, is a remote control vehicle (ROV – Remote Operated Vehicle). It can dive 6,000 m deep.

ROV LUSO has achieved to finish three campaigns in which it accomplished 88 dives in a total of 350 hours .

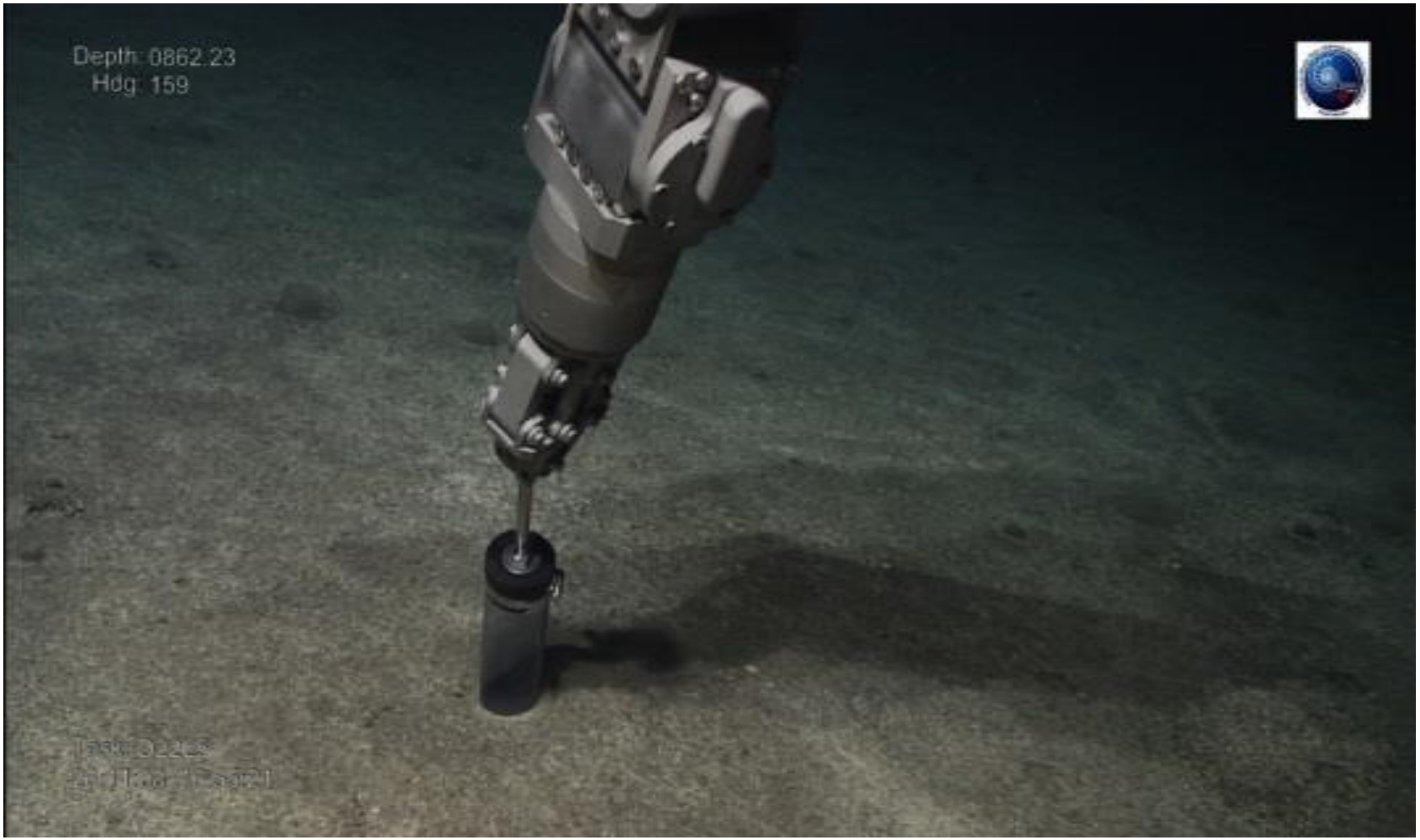


Working with ROV LUSO

Working with ROV LUSO



Working with ROV LUSO



Working with ROV LUSO

Working with ROV LUSO

Working with ROV LUSO

Popular species from the Portuguese sea

- Currently Portugal is the country of the UE in which the amount of fish eaten per person is the biggest and it is the third worldwide.
- More than half of the species can be found in the oceans.
- 250,000 types of species are known.
- Possibly, there are between 500.000 to 10 million species.
- Our attitude as fish consumers will determine the future of Mankind´s relationship with the Sea.

The Sea at your table

- Fish have had great importance as a nutritional element since ancient times.

- Besides proteins, fish give important mineral salts, such as phosphorus, which is essential to the nervous system, especially brain activity.

Mackerel Courses

Boiled mackerel

Canned mackerel

Baked mackerel

Tuna Courses

Tuna Muxama - a kind of tuna ham

Canned tuna

Tomato tuna steak

Cod courses

Codfish and cream

Baked codfish

“Bacalhau à Brás”

Sardine courses

Grilled sardine

Canned sardine

Sardine salad

Bream Courses

“Salted”Bream

Grilled Bream

Baked Bream

Octopus Courses

“Polvo á lagareiro”

Octopus rice

Fried octopus

Seafood

Bulhão Pato Clams

Crab

Fresh fish and seafood