

THE BLUE
BOAT
INITIATIVE

Contents

PART I



- 4 Chile, an ocean-dependent country
- 5 Importance of the Chiloé Ecoregion

PART II



- 8 About us
- 10 Our history
- 12 Our mission
- 13 Climate Change, a multidimensional phenomenon

PART III



- 16 About us
- 17 Lines of work and programs
- 19 Our work with whales

PART IV



- 24 The role of oceans in Climate Change
- 26 The role of whales in the fight against Global Warming
- 32 Project's objective
- 33 Structure
- 34 Expected Impact
- 36 Institutionalilty



Ministerio del
Medio
Ambiente

Gobierno de Chile

PART I

Chile

Jaume Galofre
Chiloé Island

Chile, an ocean-dependent country

Chile is an ocean-dependent country with a coastline that stretches for over 4,500 kilometers. **A quarter of its population lives in coastal communities.**

Worldwide, 680 million people live in coastal areas.

However, the oceans - which cover more than 70% of the Earth's surface - are under multiple threats. Despite only absorbing 26% of anthropogenic CO₂ emissions, the oceans are facing historical levels of pollution, from “plastic islands” to the progressive destruction of the marine habitat, and the resulting effects on climate change.

In this regard, Chile has been committed for several years to a progressive agenda on the subject of marine protection. In particular, the country went from having 4% to **43% of its marine area under some protection system between 2004 and 2019.**

Although Chile has thirteen protected areas, 90% of them are concentrated in three ecoregions. The country has five reserves, in addition to ten fully protected marine parks. **This places Chile among the five countries with the most protected marine areas in the world, together with the United States, Australia, New Caledonia and New Zealand.**

Importance of the Chiloé Ecoregion

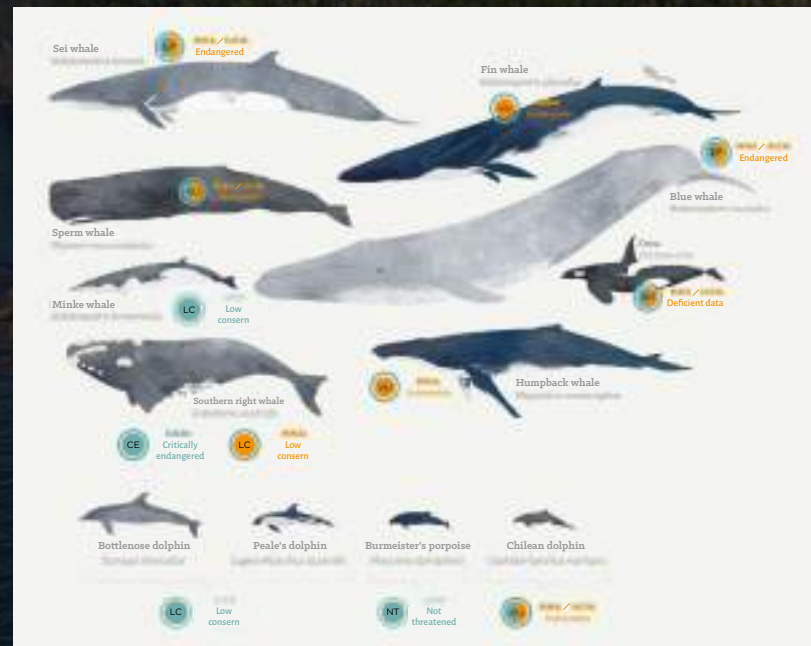
The Chiloé-Corcovado marine ecosystem is part of the so-called Chiloé Ecoregion, one of the five ecoregions on the Chilean coast.

This ecoregion has been classified as an area of great interest for marine conservation, both in Latin America and the Caribbean. This is due to the great diversity of organisms, especially marine invertebrates, fish, birds and mammals, which make it an area of high biological productivity and great ecological value. It is also an area of great economic development thanks to the aquaculture industry.

Furthermore, this marine ecosystem is the largest feeding ground for the **blue whale** (*Balaenoptera musculus*) in the southern hemisphere, where other mysticetes and odontocetes can also be seen feeding or swimming.

This area is of high interest for the conservation of whales. Due to the high concentration of these cetaceans in the area and their impact on climate change, an oceanographic study is needed as this umbrella species not only feeds many other marine species but also captures an average of more than 33 tons of CO₂ per animal.

CHILE: 43 cetaceans, 34 odontocetes and 9 mysticetes



In 2008, Chile banned whaling, including whaling for scientific purposes (Law No. 20,293), becoming a refuge for these cetaceans. This law marked a milestone in the conservation of the species, since Chile not only established a regulatory framework in this area, but also assumed, indirectly, the protection of its habitat.

In particular, the law instructs the competent authorities to take the necessary measures or establish regulations for the protection of these species, requiring fishing vessels to have a contingency plan in case of collision, damage or accidental extraction of cetaceans.

The need to join efforts to fight climate change and its effects on the oceans has been one of the requirements defined by Chile in its National Ocean Policy. In that regard, since 2012, Chile has been a part of the 51 countries that make up the London Protocol, one of the first global conventions dedicated to protecting the marine environment from human activities associated with the dumping of waste in the sea.

Its objective is to promote the effective control of all sources of marine pollution and the adoption of all possible measures to prevent pollution of the sea caused by the dumping of wastes and other materials.

In this respect, nature-based solutions become increasingly relevant. Therefore, the development and implementation of *blue carbon-based* activities requires a strategic policy and legal mechanisms, both to encourage the conservation, restoration and sustainable use of the coastal area, and to reverse the damage to coastal systems.



FILANTROPÍA
CORTÉS
SOLARI

PART II

Carlos Echavarría
Melimoyu Elemental Reserve
Northern Patagonia

About us

Filantropía Cortés Solari (FCS) is a philanthropic institution with more than 17 years of history, whose mandate is to **promote comprehensive and sustainable development, through science, education and conservation, in accordance with the United Nations' Sustainable Development Goals (SDG).**

For this purpose, FCS has two foundations (Caserta and MERI) and three Elemental Reserves, the latter being territories for effective conservation, located in the following strategic areas of Chile: the Atacama Desert (the most arid desert in the world, located at Latitude 22°), San José de Maipo (near the capital of Chile, Santiago, located at Latitude 33°) and Northern Patagonia (Latitude 44°).



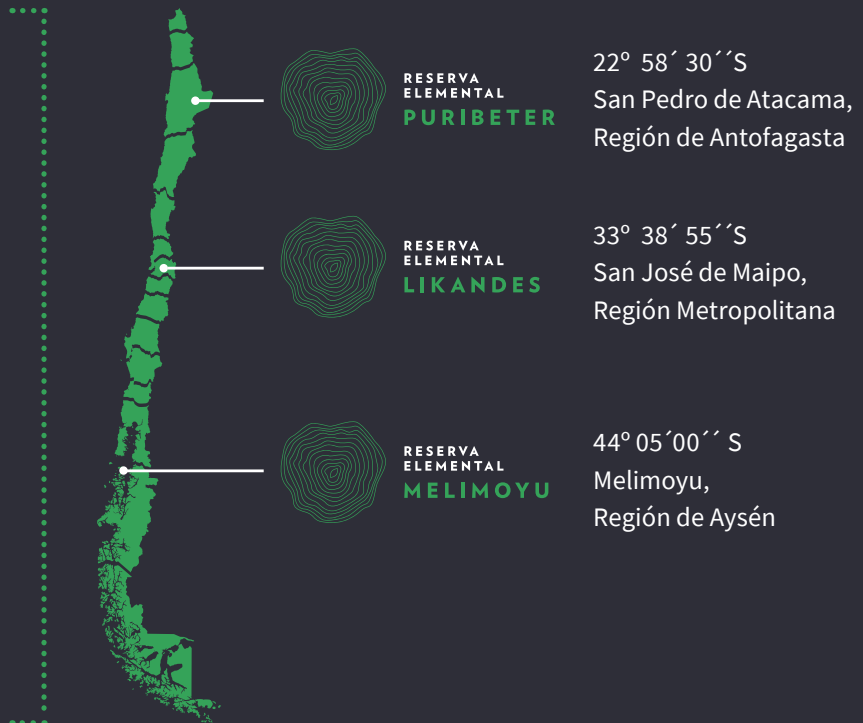
FUNDACIÓN
CASERTA

Design and implement integral education programs



FUNDACIÓN
MERI

Develops science and environmental education programs at the service of conservation



Francisca Cortés Solari

Francisca Cortés, a philanthropist, conservationist and entrepreneur, is passionate about nature.

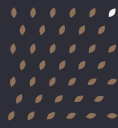
The granddaughter of Eliana Falabella and Alberto Solari -founders of the Falabella Empire- and the daughter of María Teresa Solari Falabella, Francisca Cortés has been a pioneer in the development of philanthropy that is defined as actions that emanate from the private sector, but are always of public interest.

As Executive President of Filantropía Cortés Solari, she has placed special emphasis on promoting the comprehensive and sustainable development of Chile and Latin America, through science, education, culture and conservation, especially in the context of climate change.

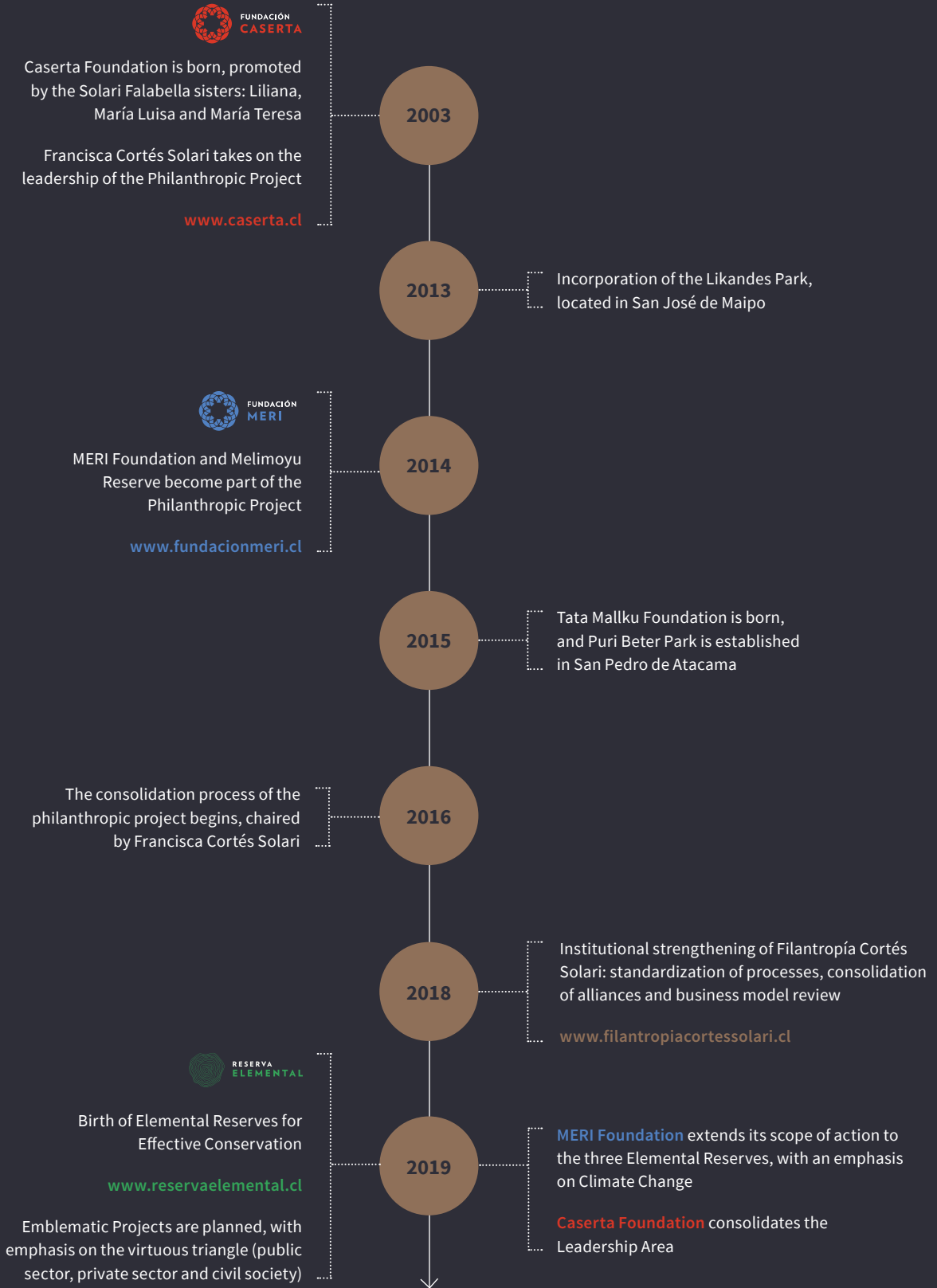
She has received several awards for her work in philanthropy, science and conservation. Some of which include the “100 Women Leaders” award, given by the El Mercurio newspaper; as well as the “Influential Women” and “Woman Speaks Out” awards, for her contribution to strengthening women’s leadership in scientific, environmental and educational matters, and the “Ecoscience” and “Recyclápolis” (2018) awards for her significant contribution to the development of science, among others.



Our history



FILANTROPÍA
CORTÉS
SOLARI



An institutionality at the service of Philanthropy

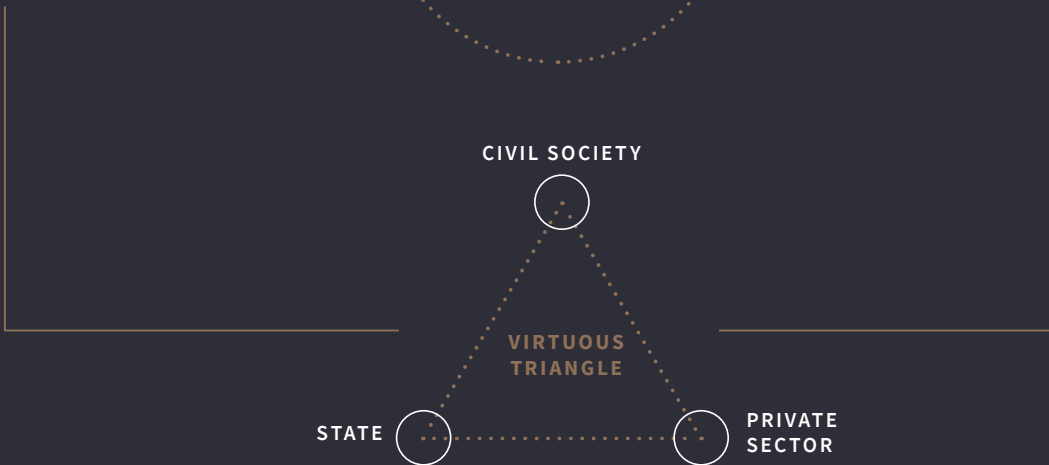


Foundations

Non-profit legal entities responsible for designing, promoting and executing projects and programs consistent with the mission of each organization, and in line with the philanthropic mandate.

Sustainability Model

Territories for Effective Conservation. With low-impact infrastructure, which ensures the implementation of programs in science, education and culture, serving the community and decision-makers.



Our mission

We promote the comprehensive and sustainable development of Chile and the region, through science, education and conservation, in accordance with the United Nations' SDGs.

To do this, we work in three areas of action:

Science: We promote the development of scientific research at the service of effective conservation and climate change.

Education: We promote the development of education for sustainability, which includes comprehensive education, leadership, and environmental education programs.

Conservation: We have implemented an effective multidimensional conservation model, starting with three Elemental Reserves, located in strategic territories of Chile, replicable to other territories of the country and the world.



Climate Change, a multidimensional phenomenon

Conservation for Climate Change

We know that the effects of global warming are inescapable and have substantially changed our lives.

The consequences of prolonged droughts, floods, melting ice, sudden hurricanes and desertification, among many other phenomena, reflect the multidimensional nature of climate change.

Global warming has become a planetary emergency that requires all agents of society to intervene collaboratively.

In this sense, **effective conservation**, understood as a set of actions or initiatives aimed at preserving the biodiversity of a territory, is an essential strategy when facing climate change.

These actions can come from both the public and private sectors, or from a public-private partnership.

Effective Multidimensional Conservation

Effective conservation must be approached from a multidimensional perspective, which includes both the environmental and the **social, cultural and economic dimensions**.

Through the MERI Foundation and its Elemental Reserves, FCS promotes comprehensive and sustainable development, analyzing and studying species and ecosystems under threat, both in Chile and in the rest of the continent.

At the Elemental Reserves —our territories for effective conservation— the MERI Foundation studies diverse “objects of conservation”, that is, species under threat throughout the region, in order to provide decision makers with scientific evidence that allows for better decision-making.

The Elemental Reserves were also created as territories at the service of the community, putting science at the service of conservation, but also facilitating the creation of experiential and environmental education programs, available to the community, so that they can better understand their own ecosystems.





FUNDACIÓN
MERI

PART III

About

Created in 2012, the MERI Foundation is a private non-profit institution whose mission is:

**To develop scientific research
and environmental education in
connection with communities
for the conservation of strategic
ecosystems in Chile.**




Lines of work and programs

To fulfill its mandate, the MERI Foundation carries out three lines of work:

- **Scientific research**
- **Environmental education programs**
- **Community engagement projects**

This research is done not only to generate scientific knowledge, but also scientific evidence of public interest, for correct decision-making.

Science Area

TOPIC	LINES OF SPECIALIZATION
 <p>Water, oceans and cetaceans</p>	<ul style="list-style-type: none"> · Aquatic Ecotoxicology · Aquatic Invasive Species · Cetacean Acoustics · Cetacean Behavior · Oceanography · Limnology
 <p>Terrestrial systems</p>	<ul style="list-style-type: none"> · Forest Ecology · Plant Ecophysiology · Glaciers and Volcanoes · Geology · Meteorology
 <p>Ecological Restoration</p>	<ul style="list-style-type: none"> · Ecological Restoration · Agroecology

Environmental Education Area

The environmental education area designs and implements educational programs with a comprehensive approach. Through these programs, the MERI Foundation aims to not only make known the results of its research, but also to raise the community's awareness about its ecosystem and the threats it faces, in order to promote effective conservation.

Particularly noteworthy is the “MERI Environmental Education Plan” (PEAM) program, which aims to promote the valuation of biodiversity and natural resources of Chile's various ecosystems.

This set of programs seeks to promote the conservation of terrestrial and marine ecosystems, as well as to generate a sense of ecosystem relevance in the population through a comprehensive educational approach.

Community Engagement Area

Through the community engagement area, the MERI Foundation disseminates and shares with communities the threats affecting the ecosystems and invites them to be part of the solution



Our work with whales

History

Since 2012, as part of its Oceans Research Line, the MERI Foundation has been acoustically monitoring whales in Northern Patagonia, specifically in the Chiloe ecoregion, within the framework of scientific projects aimed at developing scientific evidence at the service of the conservation of large cetaceans in the Gulf of Corcovado.

Scientific evidence suggests the importance of moving towards a maritime regulation that would put an end to collisions between vessels and whales, and reduce the noise generated by vessels, which can cause disorientation, and at the same time disrupt basic communication between species, affecting their feeding or reproduction, as well as causing hearing damage, stranding or even death.

Progress

In 2014, it was scientifically proven that by reducing the speed of large vessels to 10 knots, it was possible to practically eliminate incidences of collisions with right whales on the coasts near New York.



NORTHERN PATAGONIA
CORCOVADO GULF
CHILOÉ ECOREGION

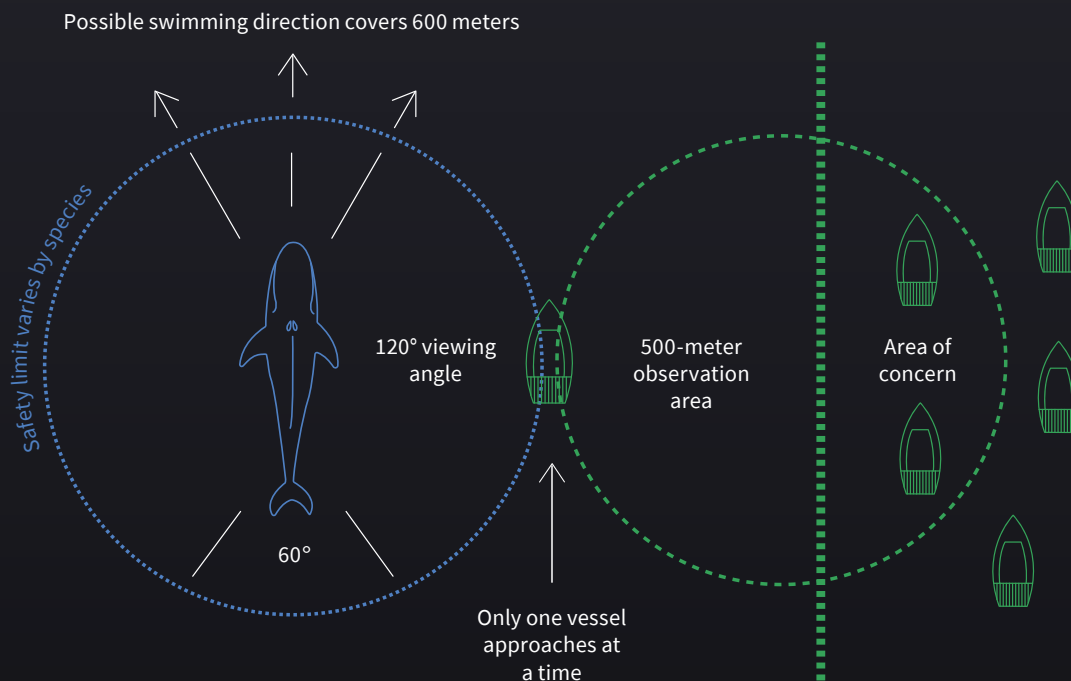


Blue whale (*Balaenoptera musculus*)

In December 2018, thanks to the joint work of the MERI Foundation and the Castro Maritime Government, Order No. 12.600/339/VRS was published, establishing voluntary measures to avoid collisions between whales and vessels navigating their jurisdictional waters (Pacific Sea and interior of Chiloé, Chacao Channel, Gulf of Ancud, Guafo Channel and Corcovado Bay, Tic Toc Bay, fjords and channels in this area)¹.

These measures include limiting the maximum speed of vessels (10 knots during the day and 8 knots at night), which would be sufficient to significantly reduce the risk of collision and noise.

This milestone, a pioneer of its kind in Chile, motivated the continuation of efforts - both in this and other countries in the region - to develop similar measures, this time binding, to protect these cetaceans, so that maritime transport can develop in a way that is compatible and sustainable with marine biodiversity.



¹ Link www.fundacionmeri.cl with Order No. 12.600/339/VRS



Whale Expedition



Cetacean environmental education



Layard's whale necropsy



Transfer of Layard's beaked whale



Whale tail



Cetacea Expo, Natural History Museum of Valparaíso



Passive acoustic monitoring of blue whales



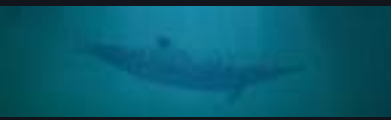
2nd Blue Whale Expedition
 “Melimoyu: Whale Song” Album



4th Blue Whale Expedition
 “Blue Patagonia” Documentary



“Cetacea, Echoes of the Sea” Expo



“Layard’s beaked whale’s Last Journey” Documentary



6th Blue Whale Expedition



2012

Passive acoustic monitoring of blue whales



2013

Passive acoustic monitoring of blue whales

2014

1st Blue Whale Expedition



2015

2nd Blue Whale Expedition
 “Melimoyu: Whale Song” Album

Didactic Guide on Cetaceans
 3rd Blue Whale Expedition
 Cetacean Environmental Education Program (Aysén)



2016

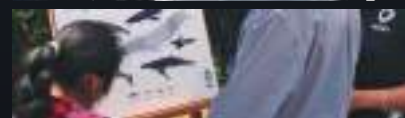
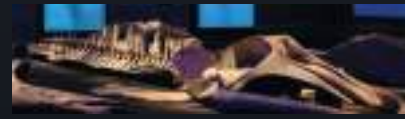
4th Blue Whale Expedition
 “Blue Patagonia” Documentary

5th Blue Whale Expedition

“Whales, Voices of the Sea” Expo. MERI-CCLM

2nd edition of Didactic Guide on Cetaceans

Cetacean Environmental Education Program (Chiloé)



2017

2018

2019

2020

THE BLUE
BOAT
 INITIATIVE

THE BLUE
BOAT
INITIATIVE



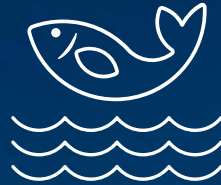
PART IV

The role of oceans in Climate Change

The UN has proclaimed the period of 2021-2030 as the “**Decade of Ocean Science for Sustainable Development**”.



The ocean covers **72%** of the earth's surface, being key to life on the planet and a fundamental part of the global climate balance. Oceans are thermoregulators, keeping the planet at an optimal temperature, as they absorb a thousand times more heat than the atmosphere and redistribute it through ocean currents and exchange with the atmosphere.



Oceans hold **96%** of all the water on the planet, providing more than 20% of the animal protein for one billion people worldwide, with coastal ecosystems producing almost 80% of the resources exploited by 90% of the world's fisheries.



All the inhabitants of the planet depend directly or indirectly on the oceans, as they provide **55%** of the oxygen we breathe and are an important source of resources, such as energy, food, medicine, transportation, tourism, among others.



Coral

The ocean is a mitigator of climate change, absorbing 30% of human-produced anthropogenic CO₂ emissions, a figure comparable to that captured by terrestrial ecosystems (forests, savannas and shrublands, to name a few).

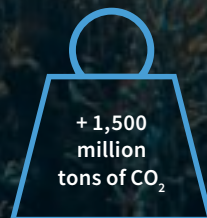
We know how important forests are in removing carbon dioxide from the atmosphere. However, the oceans not only absorb it, they trap it and don't let it out, making the oceans the largest and most relevant carbon sink in the world.

About 90% of the planet's CO₂ is recycled by the oceans and is stored on the ocean floor, mostly in a state of dead biomass.

However, this continuous absorption of CO₂ has caused the acidification of the oceans, affecting organisms that use this compound as part of their shells and skeletons. Acidification carries numerous risks for various species, from algae to fish, associated with failures in development, growth, decalcification, and decreased survival and abundance.

In turn, acidification increases the activity of decalcifying organisms such as excavating sponges, which are the main bioeroders of coral reefs. This phenomenon also affects the composition of seawater, by changing the organic and inorganic speciation of trace metals.

As a result, net primary production is expected to decline as a result of ocean warming and acidification.



It is estimated that the oceans capture and store this amount annually

The role of whales in the fight against Global Warming

According to the World Economic Forum, the current failure to mitigate and adapt to climate change is among the greatest global risks to our planet, in environmental, economic and health terms.

To date, no global effort has considered the importance of the ocean as a carbon sink nor the important ecological role that whales play in mitigating climate change, and therefore the devastating impacts it would have on the marine ecosystems if they were to disappear.

The International Whaling Commission (IWC) recognized the importance of whales as “**ecosystem engineers**”, highlighting the important role they play in transporting nutrients, enhancing ecosystem productivity and sequestering carbon in their bodies, which upon their deaths provide important habitats for deep-sea organisms (a phenomenon known as “the biological pump” of whales).

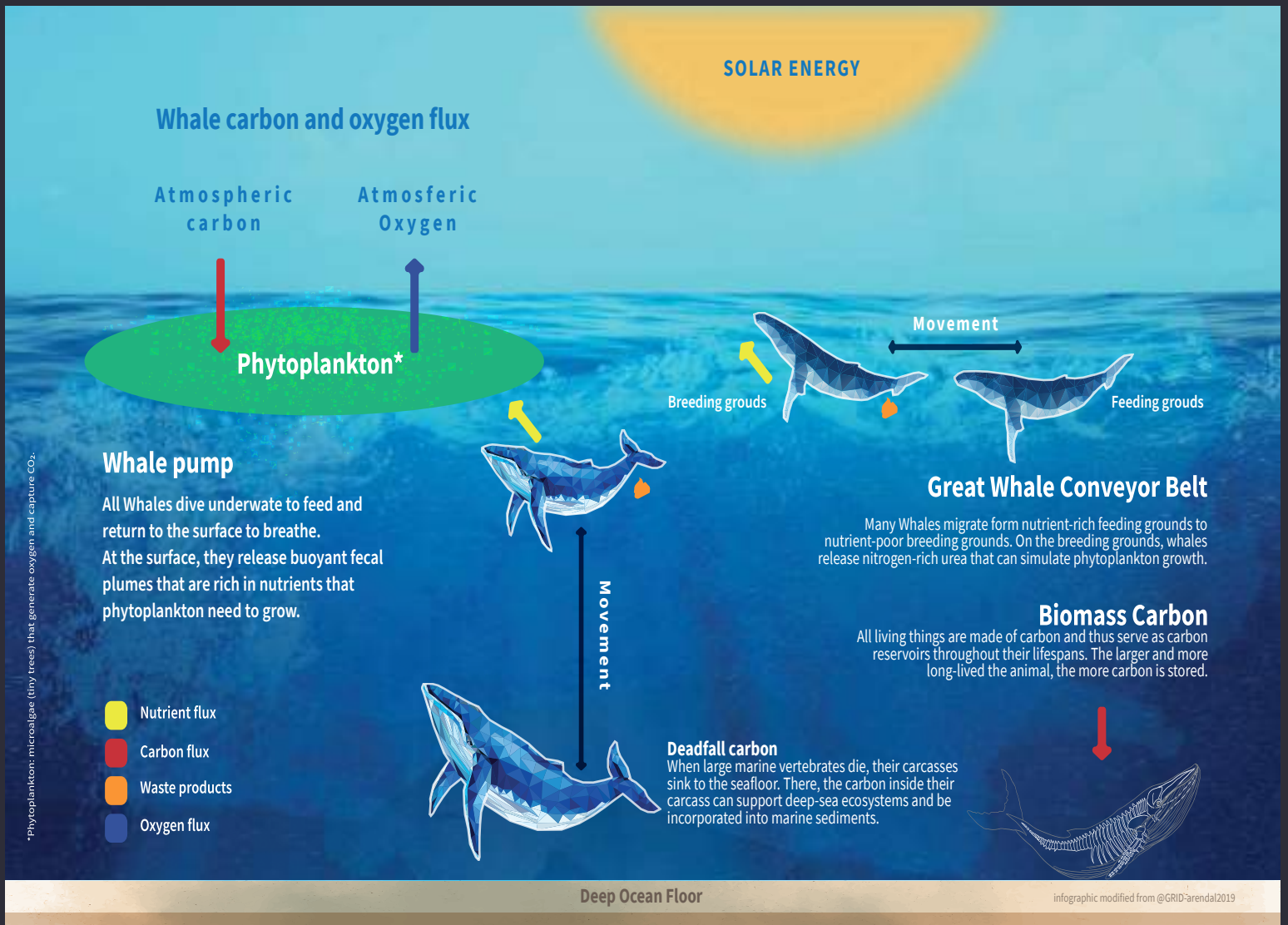


Humpback whale (*Megaptera novaeangliae*)

Whales help to reduce the CO₂ stock in the atmosphere, since the release and circulation of the nutrients they generate stimulates the appearance of **phytoplankton** and the consequent fixation of atmospheric carbon.

Whales contribute to the removal of carbon from the atmosphere through the accumulation of large amounts of carbon in their bodies. Once they die, they often sink to the bottom of the sea, contributing to the oceans being the largest storehouse of CO₂ on the planet.

A single 40-ton gray whale is capable of absorbing two tons of carbon, which could be trapped on the sea floor for more than 2,000 years.



In the 20th century, whaling reduced some whale populations by 99%, so **the current population absorbs 9 million tons less carbon, reflecting the importance of recovering the whale population.**

Scientific evidence on the role whales play in keeping the oceans alive and their contribution to carbon sequestration makes the conservation and recovery of these species a key mitigation strategy to fight climate change, especially given the multidimensional effects of this phenomenon, which affect everyone equally.



Maritime traffic

Maritime traffic is one of the main threats to marine mammals, mainly due to injuries, including strandings, caused by collisions and the noise they generate, which leads to hearing damage and loss of communication probability, among other consequences.

Today, 90% of the world's goods are transported across oceans. These vessels are getting bigger and faster, increasing the threat to the whales.

The International Whaling Commission has identified the need to address the effects of vessel collisions on cetacean populations, especially large whale populations, as a worldwide conservation concern.



Death of blue whale after collision with vessel. Craig Hayslip, Oregon State University Marine Mammal Institute, 2014.

Reducing the threat of collisions is a complex issue to address, due to the variation of factors depending on the region and the season. Also, many collisions go unnoticed.



- In 2018, 10 dead whales washed up in the San Francisco Bay Area in the U.S., as a result of collisions. This figure represents an increase from the observed average of 3 per year over the last 5 years.
- In the last 10 years, at least 60 whales, including blue, gray, fin and humpback whales, were found dead off the coast of California with signs of collision.
- Between 2007 and 2016, an estimated 1,200 vessels collided with whales.



Source:
International
Whaling
Commission



Source:
International
Whaling
Commission



Source:
Alvarado-Rybak
et. al. 2020

Project's objective



The Blue BOAT Initiative (Buoy Oceanographic Alert Technology) is a project sponsored by the Chilean Ministry of the Environment, developed jointly with the MERI Foundation, which aims to preserve and protect whales, while monitoring the oceans, studying and valuing marine ecosystem services, particularly those associated with the capture of CO₂ by whales, necessary to address climate change.

This project will install and connect the first South American network of sonobuoys, which **will make it possible, through real-time whale vocalization detection, to warn vessels in the area of the presence of whales, so that they can reduce their speed and decrease the risk of collisions and underwater noise.**

In addition, temperature, pH, salinity, nutrient, chlorophyll (through a fluorometer) and dissolved oxygen sensors will be installed on these buoys to record variations and serve as indicators of climate change in the oceans.

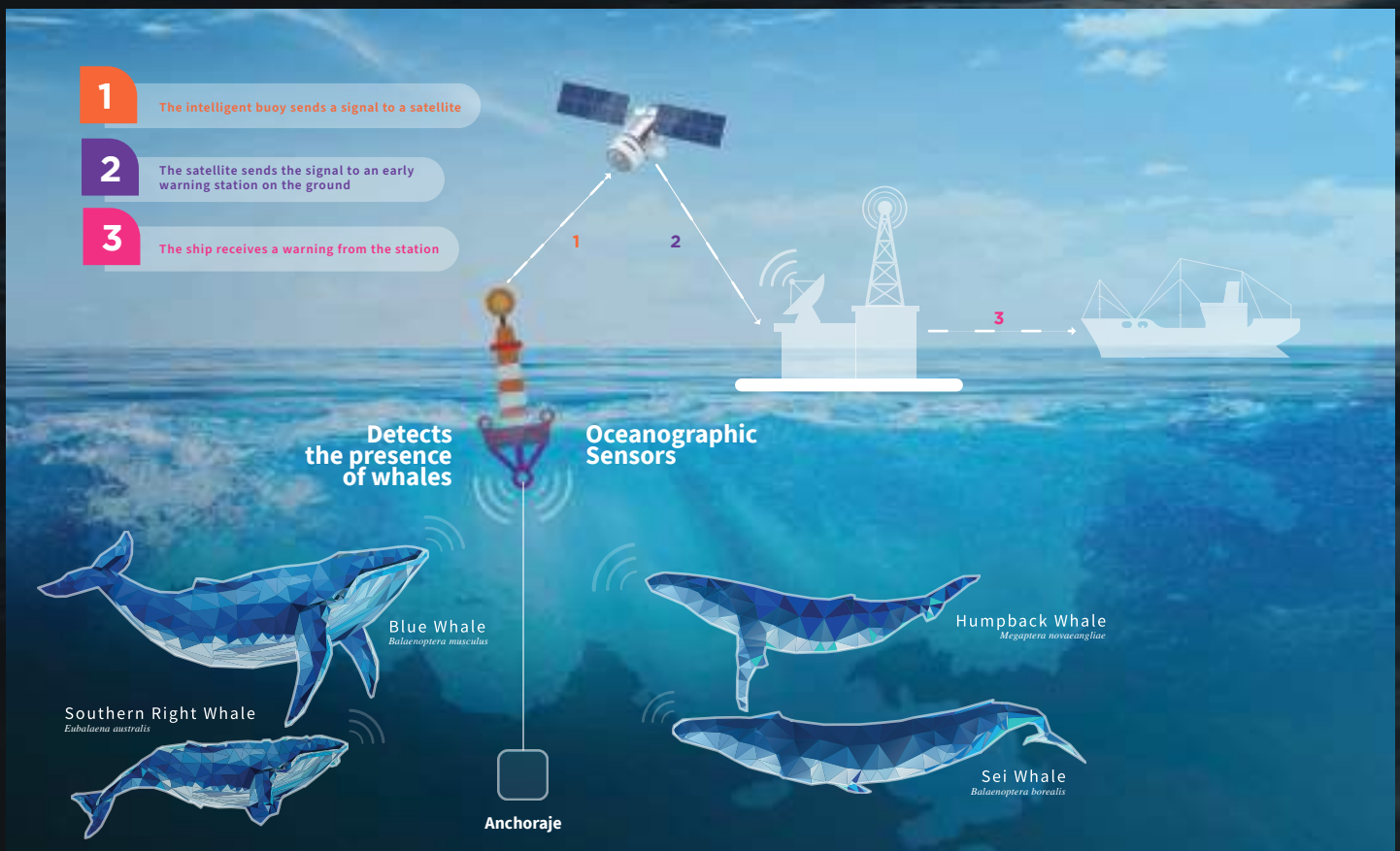
Contributing to the care of whales by avoiding collisions with vessels, reducing underwater noise and monitoring the health of the oceans is key to understanding and valuing the ecosystem services of the oceans, and of cetaceans in particular.

Structure

The Blue BOAT Initiative is a national project that the MERI Foundation carries out in conjunction with the Chilean Ministry of the Environment.

This is a Chilean project that seeks to be replicable at a regional level along the Pacific. The initiative will begin in the Chilean Patagonia, in the Gulf of Corcovado, an area that groups the largest number of blue whales, which gather to feed, and then cover the rest of the country.

The Blue BOAT Initiative will be implemented with state-of-the-art technology, tested in other countries, including a passive acoustic monitoring system and an oceanographic monitoring system.



The information collected by this project will be essential for understanding marine ecosystems and, therefore, fundamental for the valorisation of the ecosystem services of the oceans.

Joining efforts to generate tools to prevent collisions has become a priority to increase the oceans' capacity to reduce the carbon dioxide stock.

Expected Impact



The Blue BOAT is an innovative and cutting-edge initiative that aims to **reduce the carbon dioxide stock through the conservation of whales, specifically generating better conditions for their survival and monitoring ocean health.**

This project constitutes a new step towards the consolidation of the oceans, as a fundamental player in the fight against climate change, while ratifying the commitment to national and international governance in ocean matters, and the commitment to the blue economy.

At the same time, this project highlights the importance of conservation as a fundamental tool for mitigating climate change. This is based on the understanding that climate change is a multidimensional phenomenon that requires multiple approaches, ranging from the environmental to the social, cultural and financial.

Incorporating the ocean as a mitigation and adaptation measure, and protecting whales, leads to the implementation of the commitments established in the United Nations' Sustainable Development Goals associated with the 2030 Agenda, the Paris Agreement on Climate Change Targets and the Decade of the Ocean program via the Intergovernmental Oceanographic Commission (IOC).



Nature is our ally in the fight against climate change, where the development and implementation of activities based on blue carbon require a strategic policy and legal mechanisms, both to encourage the conservation, restoration and sustainable use of the coastal area, as well as to end the damage of coastal systems.

With this project, we hope not only to preserve the whales, but also to protect the marine ecosystem services that this species provides, such as CO₂ capture, and also learn more about our oceans and climate change.



Humpback whale (*Megaptera novaeangliae*)

Institutionality

The Blue BOAT Initiative is a multi-pronged, multi-stakeholder project which requires a solid institutional framework that incorporates, from the outset, the main players of the public and private sectors and civil society, both nationally and internationally.

The Blue BOAT has an **Executive Committee**, made up of representatives of the Ministry of the Environment and the MERI Foundation, which aims to guarantee the correct execution of the project, by defining the necessary actions. In particular, the committee will be responsible for:

- **Defining the guiding road map, as well as all the necessary decisions in the short- and medium-term to achieve the desired objectives.**
- **Ensuring that the suggestions made by the so-called “Work Groups” are properly evaluated and incorporated, based on the arguments presented.**
- **Ensuring that all aspects of the project are properly managed.**

This committee will be binding, so the decisions made will have to be implemented by the teams in charge of the Blue BOAT Initiative project.

The **Work Groups** will be formed based on the needs defined by the Executive Committee, and their objective will be to analyze specific topics according to their composition and description. They will be made up of specific experts on the topics of each group and will make recommendations, which will be submitted to the Executive Committee for review and approval.

EXECUTIVE COMMITTEE + **WORK GROUPS**



Experts

THE BLUE
BOAT
INITIATIVE

FILANTROPÍA
CORTÉS
SOLARI



LABORATORI D'APLICACIONS BIOACÚSTIQUES
UNIVERSITAT POLITÈCNICA DE CATALUNYA
BARCELONATECH