

THE

OCEAN BOOK

HOW ENDANGERED ARE OUR SEAS?

by Esther Gonstalla



ClimatePartner^o
klimaneutral

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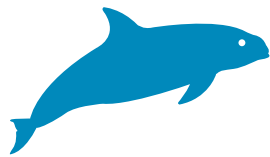
I really don't know why it is that all of us are so committed to the sea, except I think it's because in addition to the fact that the sea changes, and the light changes, and ships change, it's because we all came from the sea. And it is an interesting biological fact that all of us have in our veins the exact same percentage of salt in our blood that exists in the ocean, and, therefore, we have salt in our blood, in our sweat, in our tears. We are tied to the ocean. And when we go back to the sea—whether it is to sail or to watch it—we are going back from whence we came.

<<

US President John F. Kennedy,
Remarks at the Dinner for the America's Cup Crews
in Newport, Rhode Island, September 14, 1962

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Saving our Oceans

We are currently facing a global challenge of unprecedented magnitude: saving our ocean.

Reaching beyond the borders of States and crossing continents, the ocean covers two thirds of the Planet and represents 97 % of its biosphere.

It plays a key role in the regulation of climate and produces 50 % of the oxygen we breathe, while absorbing 25 % of the world's greenhouse gas emissions. One billion people depend on seafood as their main sources of protein, algae are used in products from cosmetics to medicine and more than 80 % of the world's trade is seaborne.

However, the consequences of climate change and marine pollution are putting our ocean under severe stress. Fish stocks are being depleted because of overfishing and illegal fishing. Over 10 billion tons of litter enter the ocean every year – and every single plastic bottle takes centuries to decompose.

It is time to stop taking the preservation of our ocean for granted and to start looking after its precious resources.

My Foundation has clearly positioned the ocean among its top priorities: better understand the environmental dangers our ocean is exposed to, fight against plastic pollution, develop marine protected areas, conserve endangered species and promote innovative solutions for a sustainable ocean.

I believe that there is hope, if we work hand-in-hand. This book, which aims to raise awareness as widely as possible by explaining the issue of ocean conservation in remarkably clear terms – appealing to our sense of responsibility – is thus particularly timely. I deeply thank the author as well as the German Ocean Foundation and Geomar for this publication.

For these reasons, together with my Foundation, I want to offer support to this book and I hope that those who read it will find it as fascinating as I have.



H.S.H. Prince Albert II of Monaco

What should the future of our oceans look like?

We humans have always lived with the oceans. We make use of them in many ways, even as we fear their enormous power, both at sea and on the coasts. For many of us, however, the ocean is not necessarily a part of our daily lives. Who thinks about the future of our oceans? Who is looking after their »health«? Oceans are being increasingly abused and polluted, especially in coastal areas. Life originated in and emerged from the oceans, and a healthy ocean is critical to sustaining life on earth. Awareness of the fact that pollution now endangers our marine environment is far from widespread.

We have always had the ocean at our service. Yet with the rapid rise of human populations, exploitation of the aquatic environment is becoming ever more intense. Questions about the future of our oceans and coastlines are becoming increasingly urgent. So how can we harmonise usage and protection?

This question seems particularly poignant in relation to fish and fisheries. Ocean fish have supplied humans in many regions with animal protein for thousands of years. In the past, fishermen often faced great peril, risking their lives to take what was needed from the ocean to provide sustenance for their communities. Thus, for a long time, the fishing industry was in balance with the ocean's ecosystems, as human need did not exceed what the ocean could spare. However, in recent years technological advancements in catching fish have caused the balance between human populations and fish populations to be lost. The current intensity of global fishing has caused the massive depletion of many fish stocks. What will the future of global fishing and our oceans look like? What should it look like?

The effects of climate change, combined with the chemical and litter pollution of our oceans, present further serious issues. As a consequence of climate change, our oceans become warmer, water levels rise, the levels of dissolved oxygen in seawater decrease, and the input of carbon dioxide turns the oceans increasingly acidic. How much pollution, especially in our coastal regions, is sustainable and reasonable?

Are there intelligent solutions to these questions that can accommodate inter-generational fairness and global responsibility? The principles of sustainability demand that we weigh economic values against the future life of the environment and develop concepts for sustainable solutions immediately. We need to understand how the ocean functions as a valuable ecosystem. We have to acknowledge our planet's limitations and work within them.

A sustainable use of the oceans is certainly possible! Steps in the right direction have already been taken: in the fall of 2015, the United Nations passed a new bill setting out sustainable development goals—for the first time with an explicit focus on our oceans, giving the problems visibility and political capital. A primary focus and objective of this book is to illuminate the biggest issues our oceans face, with the aim and profound hope that this encourages us to consider better solutions and a sustainable approach to managing our marine biospheres.



Photo: GEOMAR

Prof. Dr. Martin Visbeck, May 2016

Research of Physical Oceanography

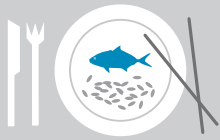
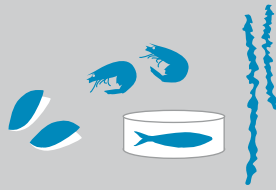
GEOMAR Helmholtz Centre for Ocean Research in Kiel
and University of Kiel

Humanity...

We profit from the oceans and use them as a:

Food provider

Fish, algae and bivalves constitute the staples of many people's diets.

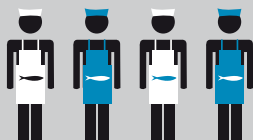


Poverty reducer

In many developing countries, fish provides the only affordable source of protein.

Energy and resource supplier

From petroleum to offshore wind farms.



Employer

Up to 12% of all employed people worldwide are dependent on the fishing industry.

Transportation route

Billions of goods are transported across the oceans annually.



Medication provider

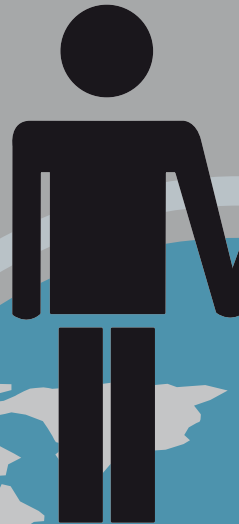
Several medications are produced with substances extracted from the ocean.



Oasis of rest and recreation

Beaches and coastal regions are popular recreational and vacation destinations.

How humanity threatens the oceans:



Climate change



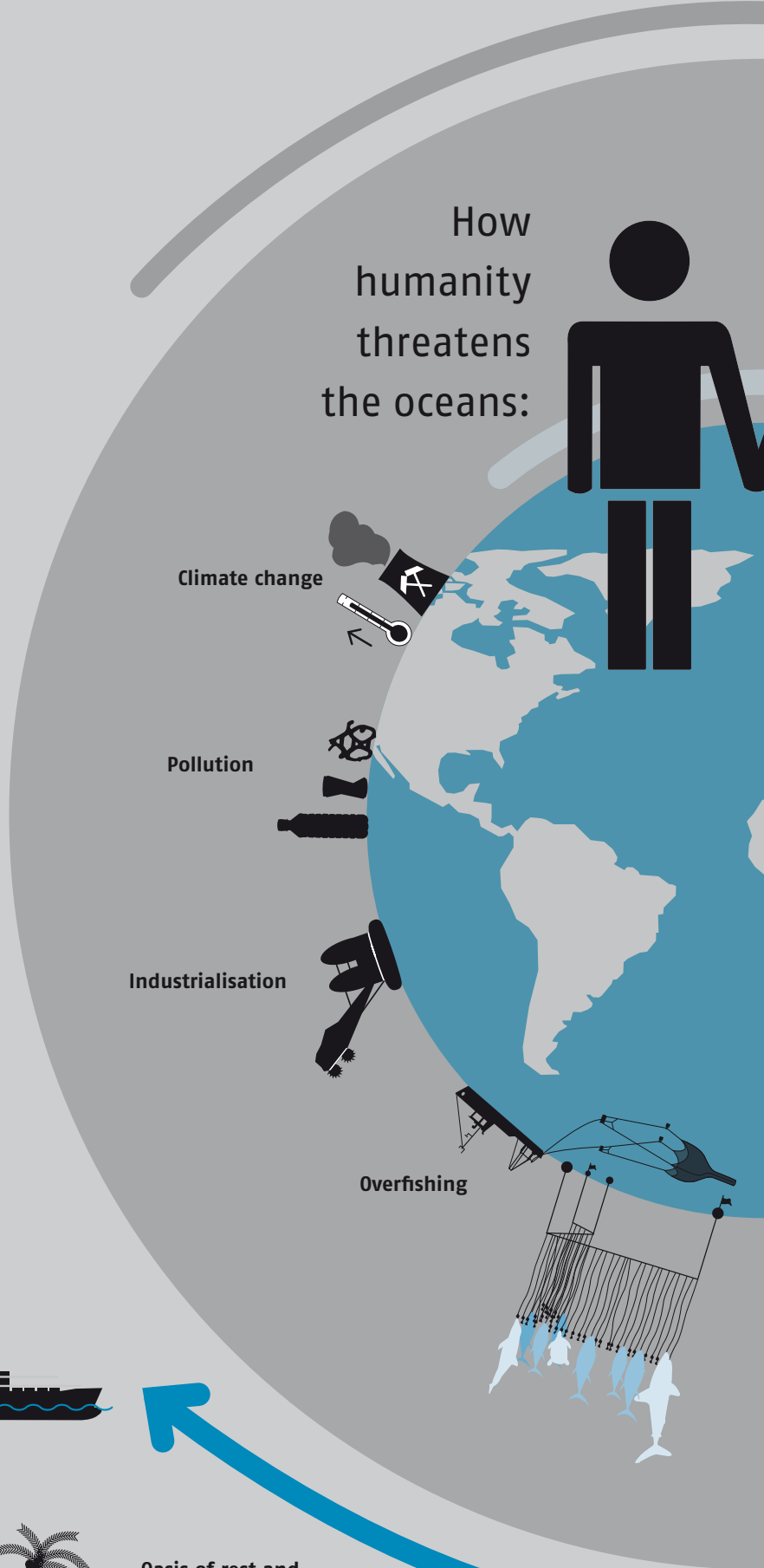
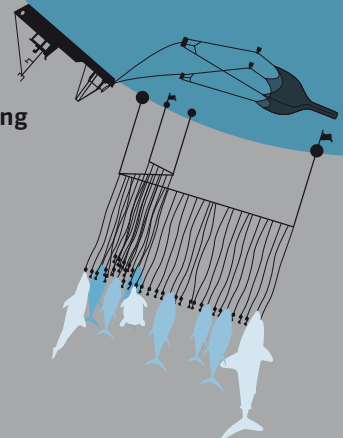
Pollution



Industrialisation



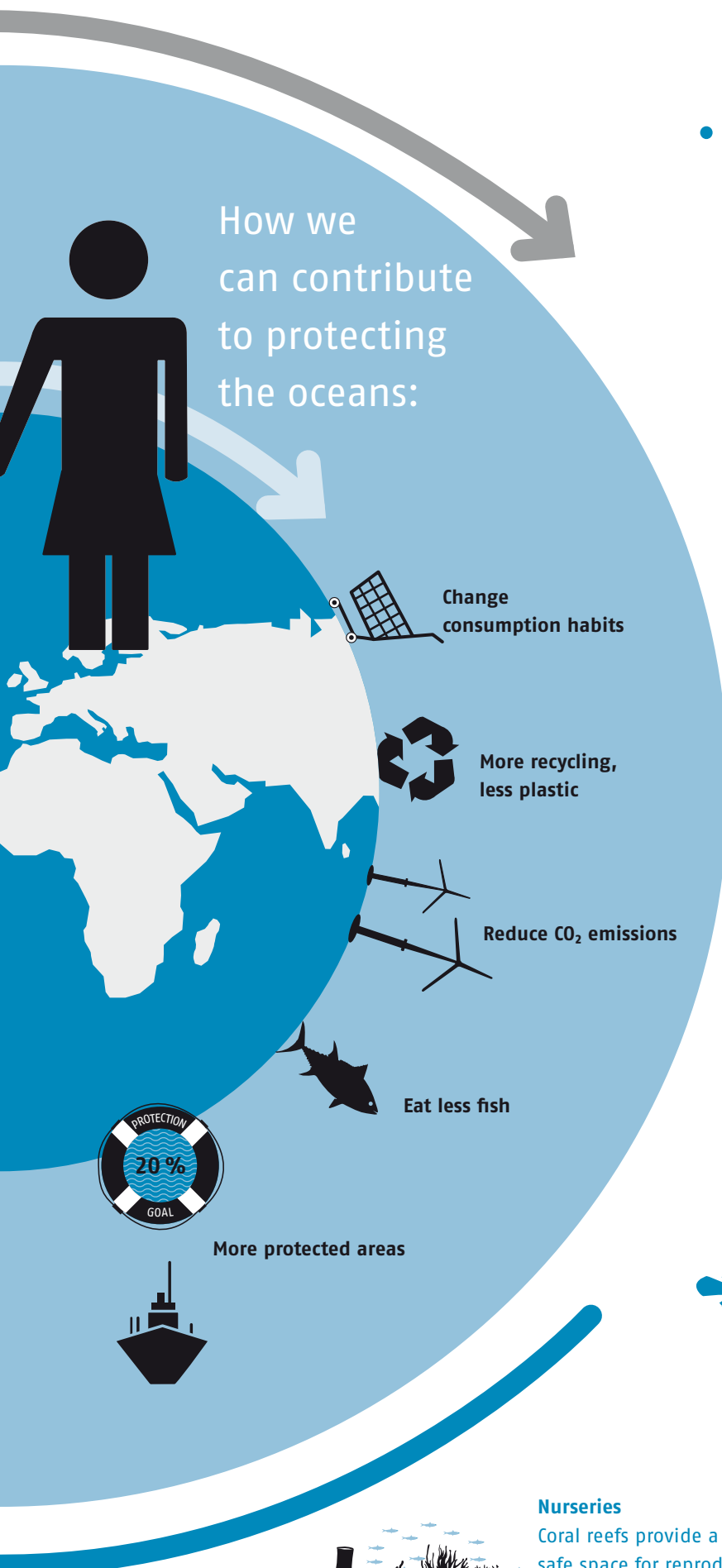
Overfishing



...and the sea

The oceans' major contributions are as:

How we can contribute to protecting the oceans:



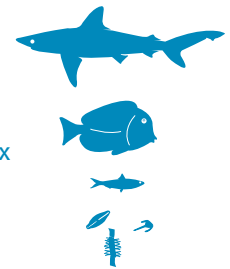
Climate regulators

They control the weather in their constant exchange with the atmosphere.



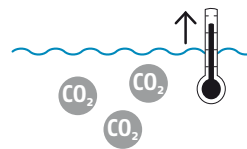
Habitats

They facilitate a balanced biosphere through complex food chains.



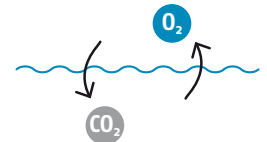
Climate protectors

They provide a »buffer action« by absorbing CO₂ and heat from the atmosphere.



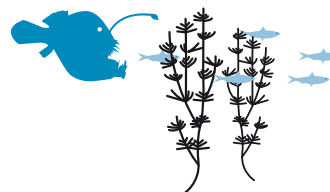
Oxygen providers

They convert our CO₂, providing oxygen, among other things.



Stabilisers

They provide stable ecosystems through biodiversity.

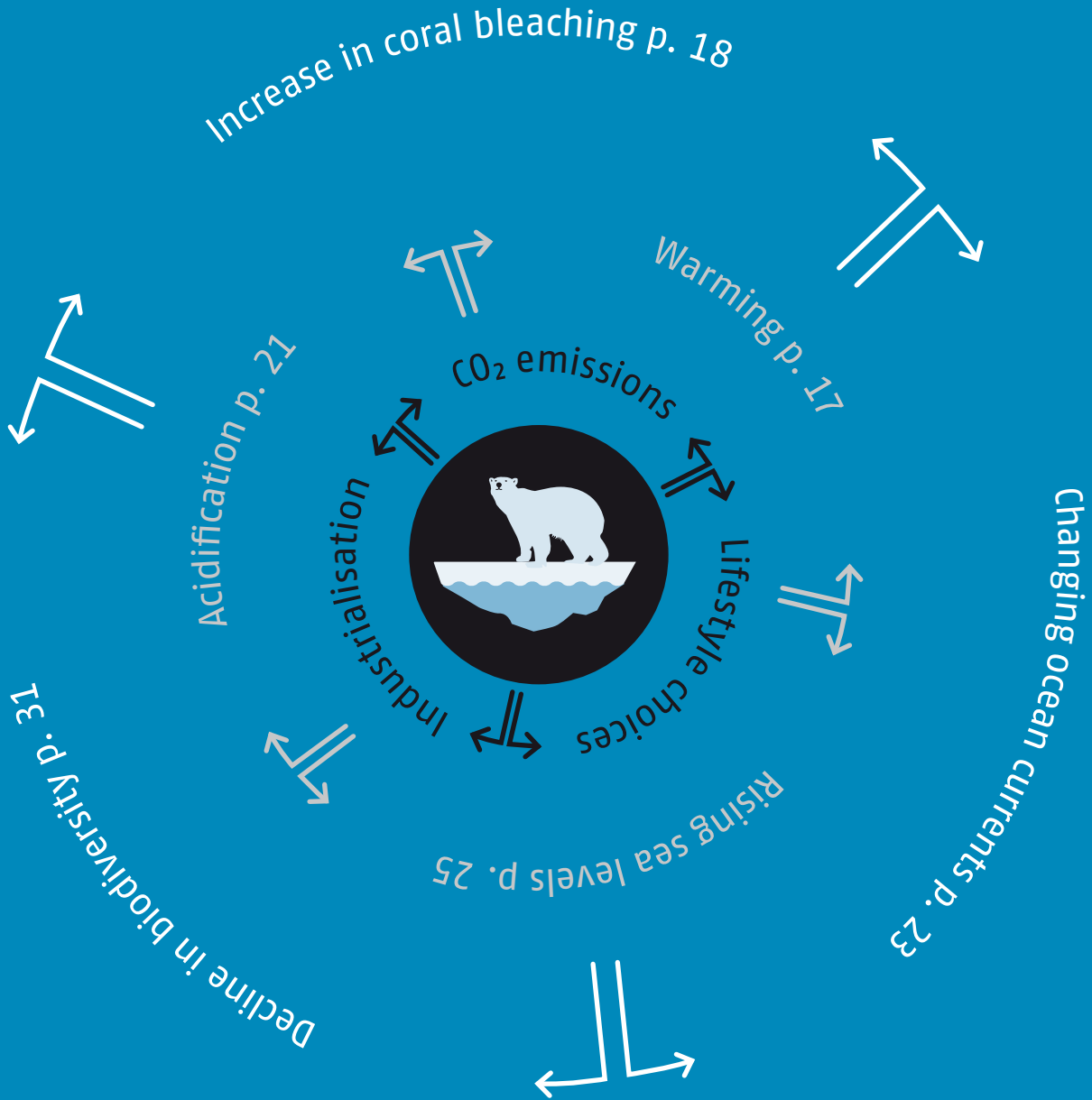


Coastal protection

Mangroves protect our coasts from erosion and flooding.



→ Causes → direct consequences → indirect consequences → approach to solutions



- Aquaculture of the future p. 65
- Renewable energy p. 75

Climate change