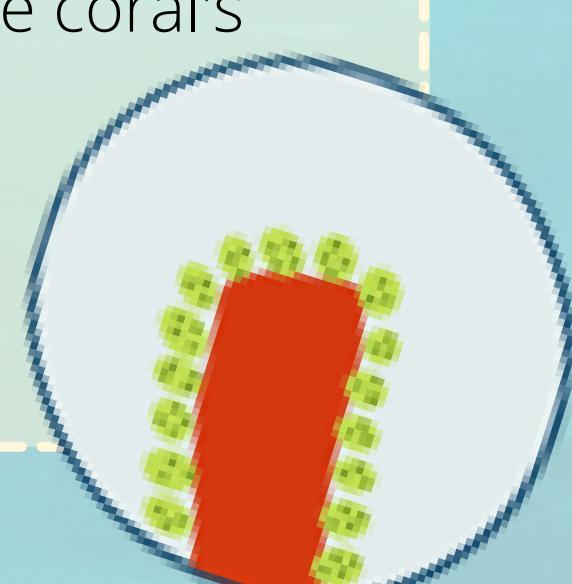


CORAL CRISIS

GLOBAL CHANGE AND CORAL BLEACHING

HOW A CORAL WORKS

- most reef-building corals contain photosynthetic algae - zooxanthellae
- they are in a dependent relationship, a symbiosis
- the coral provides the algae with a protected environment and substances it needs for photosynthesis
- the alga produces oxygen and removes waste materials. It therefore provides the coral with glucose, glycerol and amino acids. The environment is altered to produce more calcium for the coral's skeletal formation.
- the zooxanthellae are also responsible for the unique colors of the coral.



Coral reefs make up 25% of all **marine biodiversity** despite only taking up less than 1% of the **ocean floor**

WHY CORALS GET STRESSED

- Water temperature increases

Increased ocean temperature caused by climate change is the leading cause of coral bleaching. Water temperature higher than the average summer maximum – just 1°C higher for four weeks – can cause bleaching.

- CO₂ level rises

CO₂ levels in the ocean due to increasing greenhouse gas emissions, leading to ocean acidification. The corals' calcareous skeletons react very sensitively to a decreasing pH value and their calcification can decrease and their growth can slow down.

- Strong weather

Increase in strong weather, especially tropical cyclones, and consequent devastation of reefs. Simultaneous light weakening and force of the waves damage the corals.

- Sea pollution

Pollution of the seas with plastic garbage damages corals as well as the toxins poison corals.

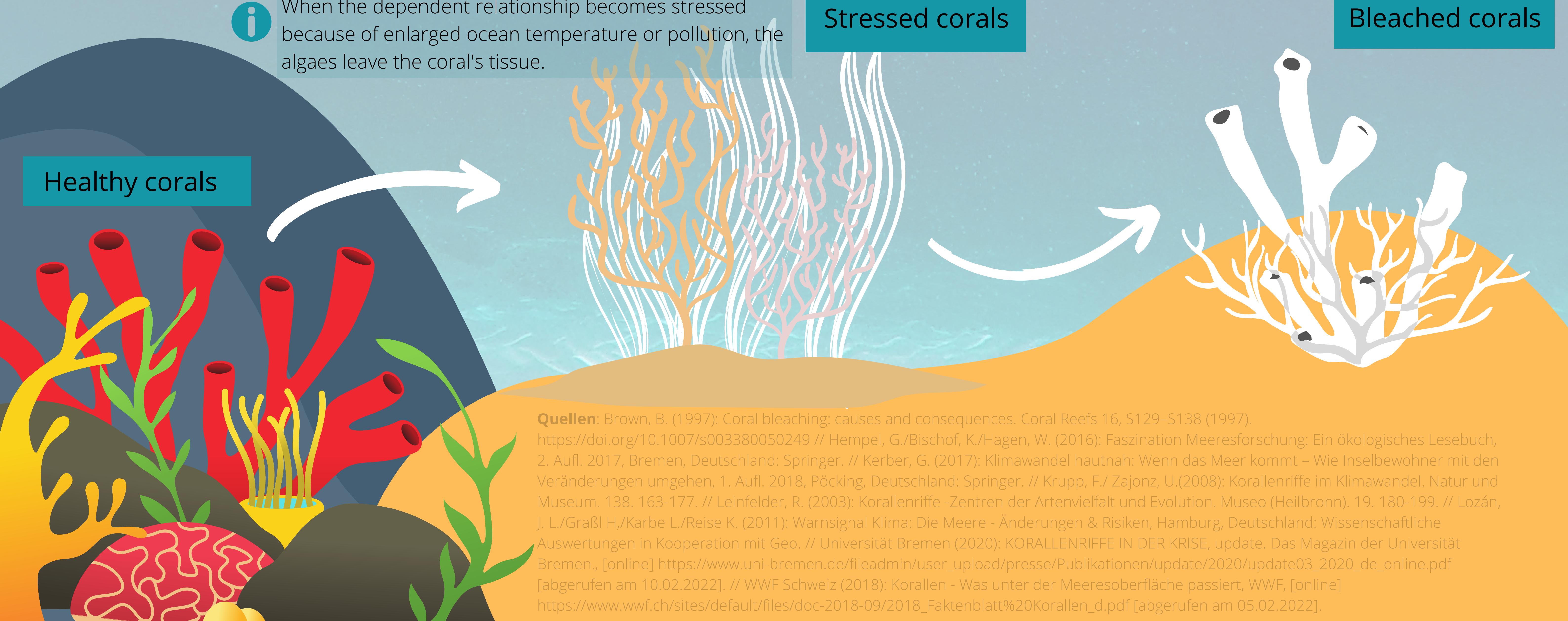
- Fishing

Conventional fishing and overfishing upset the balanced ecosystem of the coral reef, drastically reducing fish populations and thus depriving other marine life of their food source.

- Low tides

Corals get exposed to air during extreme low tides and this can cause bleaching in shallow corals.

Healthy corals



When the dependent relationship becomes stressed because of enlarged ocean temperature or pollution, the algae leave the coral's tissue.

Stressed corals

Bleached corals

WHY WE NEED CORALS

- Coral reefs are home to an enormous wealth of species.



Next to tropical rainforests, coral reefs are among the richest in species and the oldest ecosystems on our planet.

- Coral reefs as an economic foundation



An estimated half a billion people depend economically on the health of corals. Coral reefs are habitat for many species of fish that are fished and consumed by humans. Reef tourism with divers and vacationers also contributes to the economic importance.

- Corals and oxygen



We owe every second breath to the sea. Phytoplankton, microscopic algae, produce almost half of the oxygen in the air - more than all forests and meadows combined. Many of these algae live in symbiosis with corals.

- Corals algae bind carbon dioxide



Carbon dioxide is not the most potent greenhouse gas in our atmosphere, but it is certainly the most abundant. It therefore plays an important role in the context of climate change. Algae are capable of fixing large quantities of the greenhouse gas.

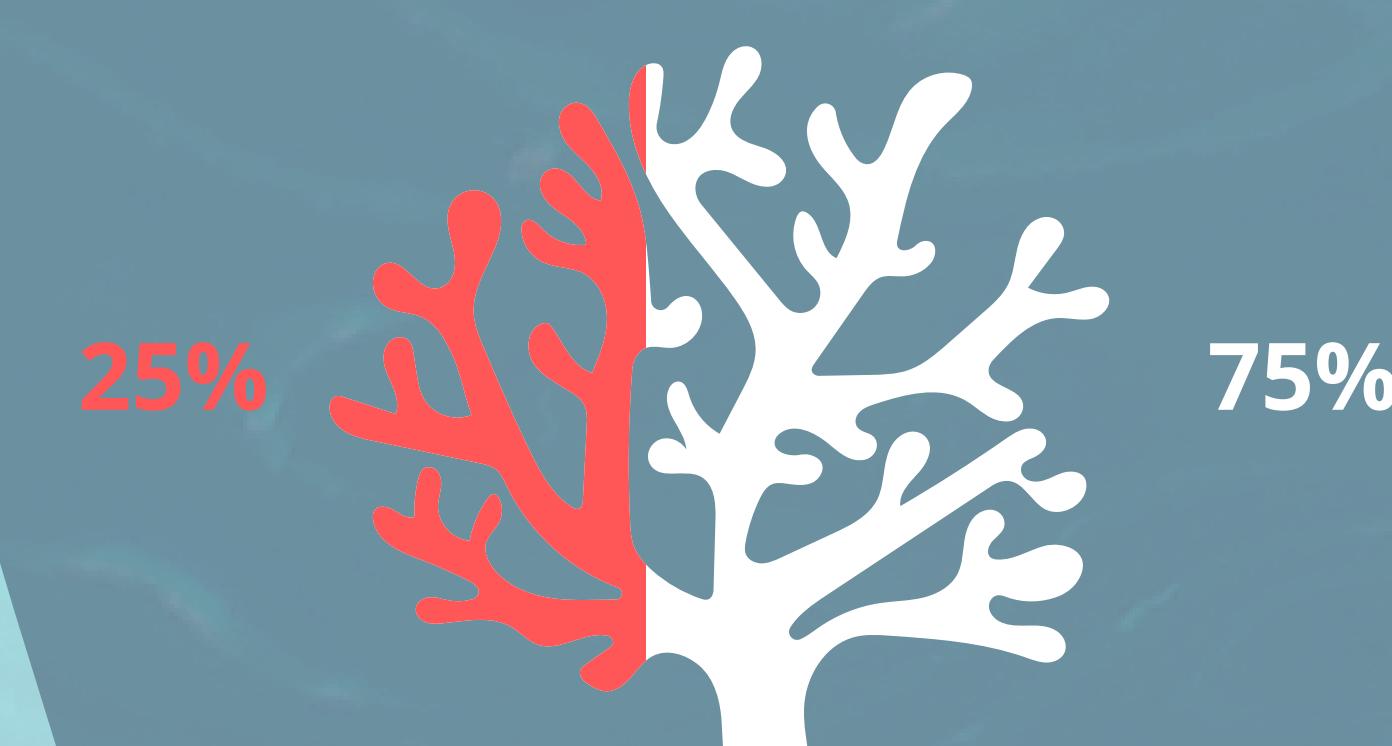
- Coral reefs protect coastlines



Reefs can act as breakwaters as their structure is very stable. For several million people in countries such as Indonesia, Vietnam or the USA the risk of flooding is decreased due to coral reefs.

WHAT IS CORAL BLEACHING?

Coral bleaching is the phenomena of whitening corals due to loss of symbiotic algae and / or their pigments. If this situation is persistent, the corals die. Many reefs all over the world are affected.



75 % of the world's tropical coral reefs experienced heat-stress bad enough to trigger bleaching

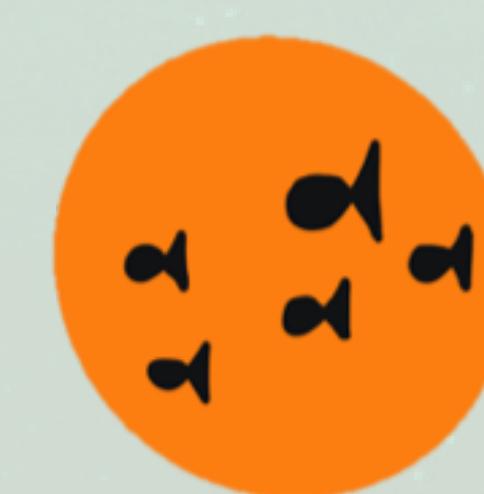
BLEACHED CORALS



If the polyps are too long without the zooxanthellae, coral bleaching will result in coral's death.



CONSEQUENCES - DEAD CORALS



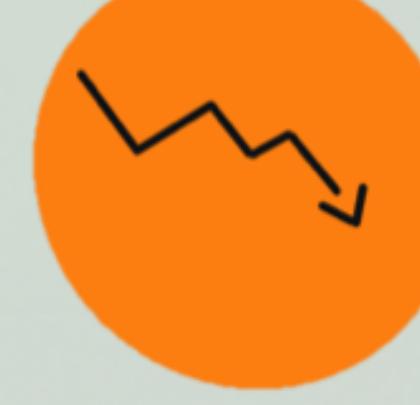
Decline in fish population



Reduced Biodiversity and environmental quality



Coastal erosion



No revenues from tourists