

# Activity 10 – Consequences of Ocean Warming



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## Why does ocean warming increase global warming?

### Background:

The oceans have a dual role in tempering global warming: On the one hand, they store heat and, on the other, they absorb CO<sub>2</sub> from the atmosphere. However, when the temperature of the water increases, these buffers lose their effect: Warm water absorbs less heat as the temperature difference with the environment becomes smaller, and it can also dissolve less CO<sub>2</sub>. It even releases it again at higher temperatures! Acidification also leads to the dissolution of lime, which releases additional CO<sub>2</sub> into the atmosphere. The water vapour, which is produced to a greater extent as a result of the increased water temperatures, is as a greenhouse gas much stronger than CO<sub>2</sub> and thus leads to an additional increase in the greenhouse effect.

### Materials:

- Approx. 30 ml of the acidic solution from the second beaker from the previous experiment
- Two 25 ml beakers
- Tea light candle and matches
- pH-value table



Experimental setup

### Implementation:

Distribute the acid solution over the two small beakers and put one of the beakers aside for later comparison.

Heat one of the two beakers with acid solution over the tea light for about three to four minutes until you can make a clear observation.

Observe the colour change and after some time note the pH values of the two solutions.

### Evaluation:

Complete the following flow chart with the text modules given here:

- Die back of calcifying creatures*
  - Reduced CO<sub>2</sub> absorption capacity*
  - Intensification of the greenhouse effect*
- Reduction of photosynthesis performance*
  - Increased CO<sub>2</sub> concentration in the atmosphere*
  - Release of CO<sub>2</sub>*

