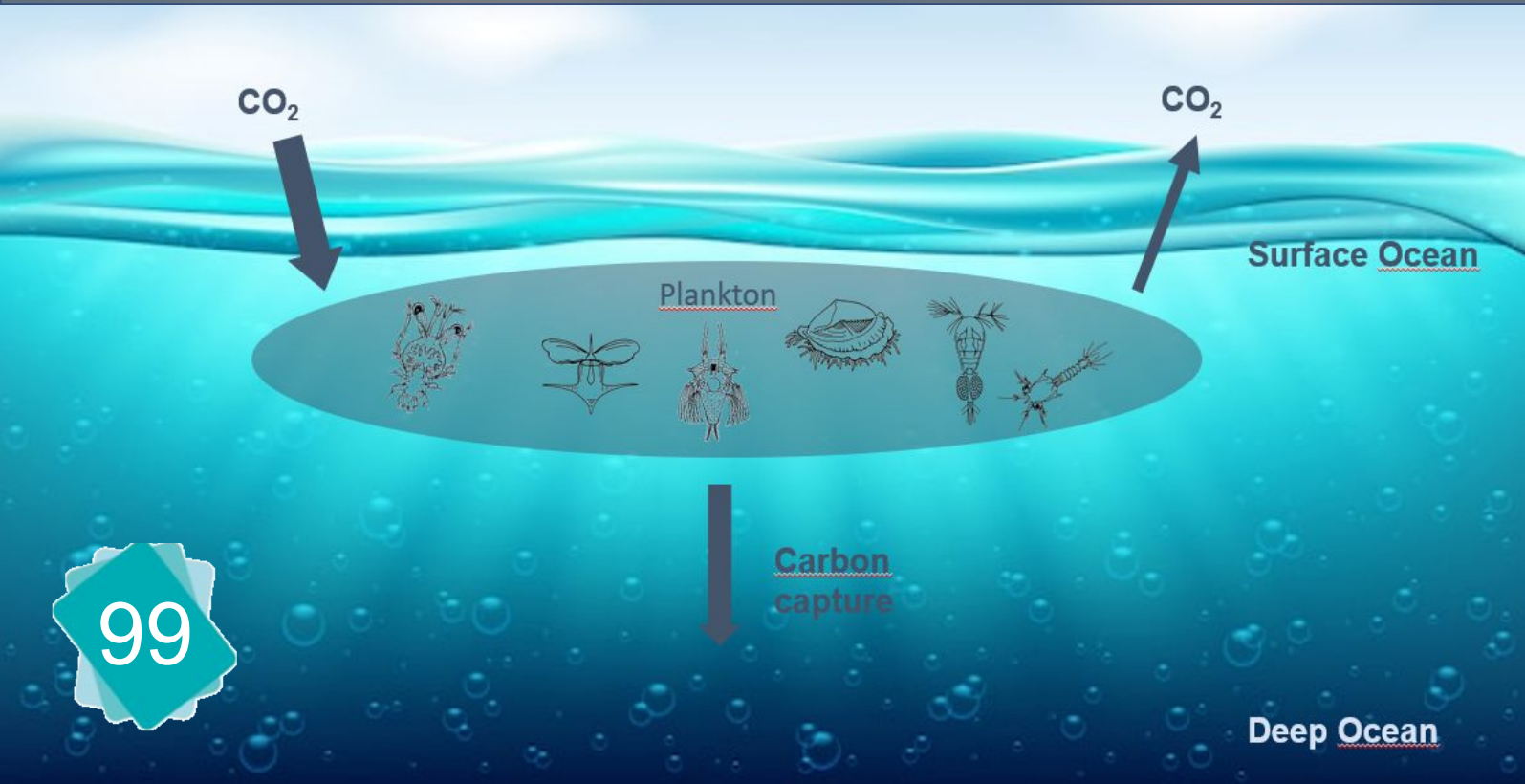
Oceanic carbon sink

99

Nearly 30% of the CO2 emissions that humans produce are captured and stored by the ocean through two processes. A physical-chemical process and the biological pump.

Biological pump



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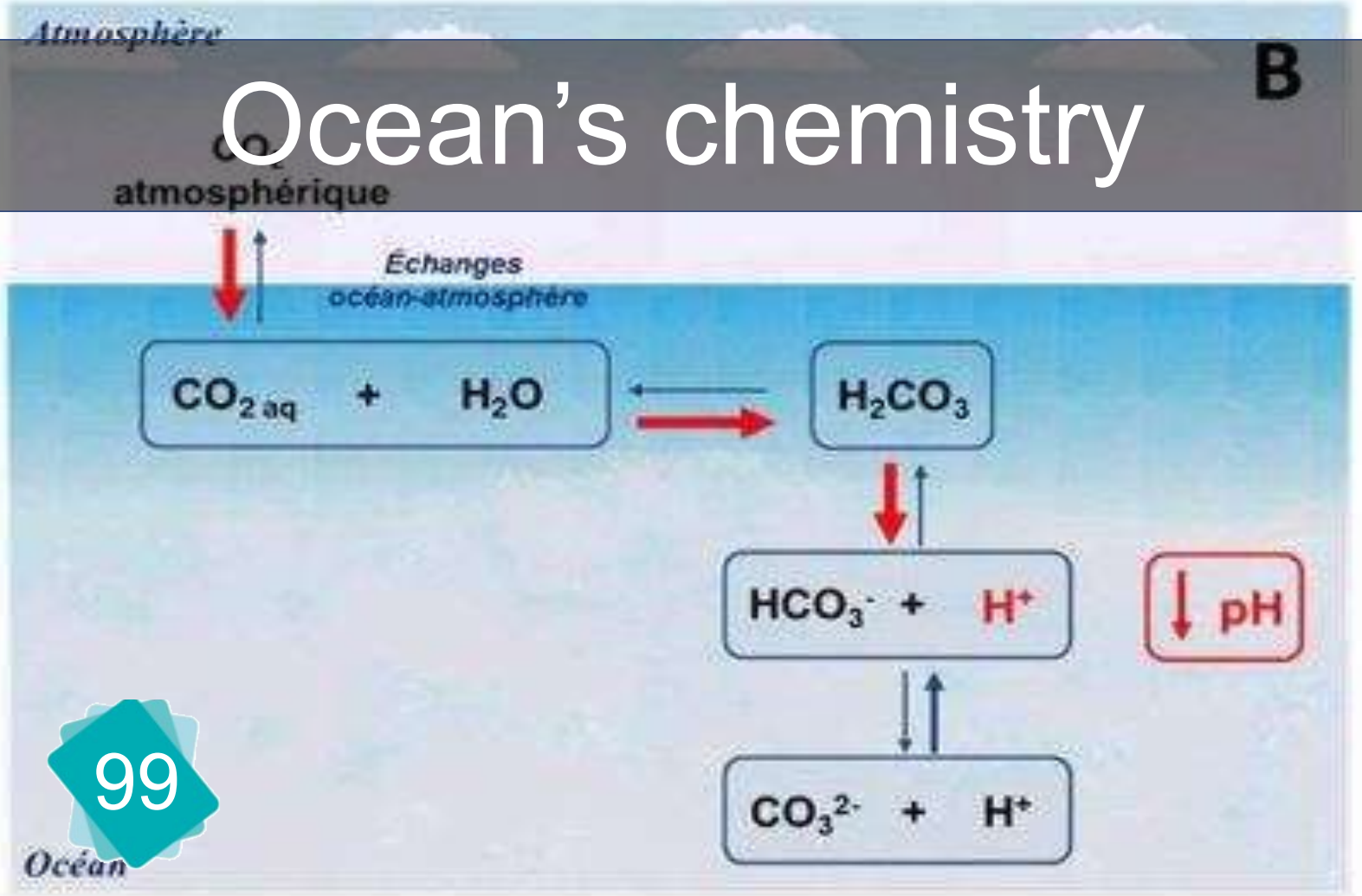
At the surface of the ocean, phytoplankton carry out photosynthesis using CO_2. These microscopic algae absorb CO_2 and convert it into organic matter and oxygen (O_2) using sunlight. When they die, some of the CO_2 is exported to the ocean floor and stored in sediments.

Ocean's chemistry



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Atmospheric CO_2 dissolve naturally in the ocean. This phenomenon is more easily achieved at low temperatures. Cold water (more dense) sink and take the CO_2 with it.

Coastal pollution

99

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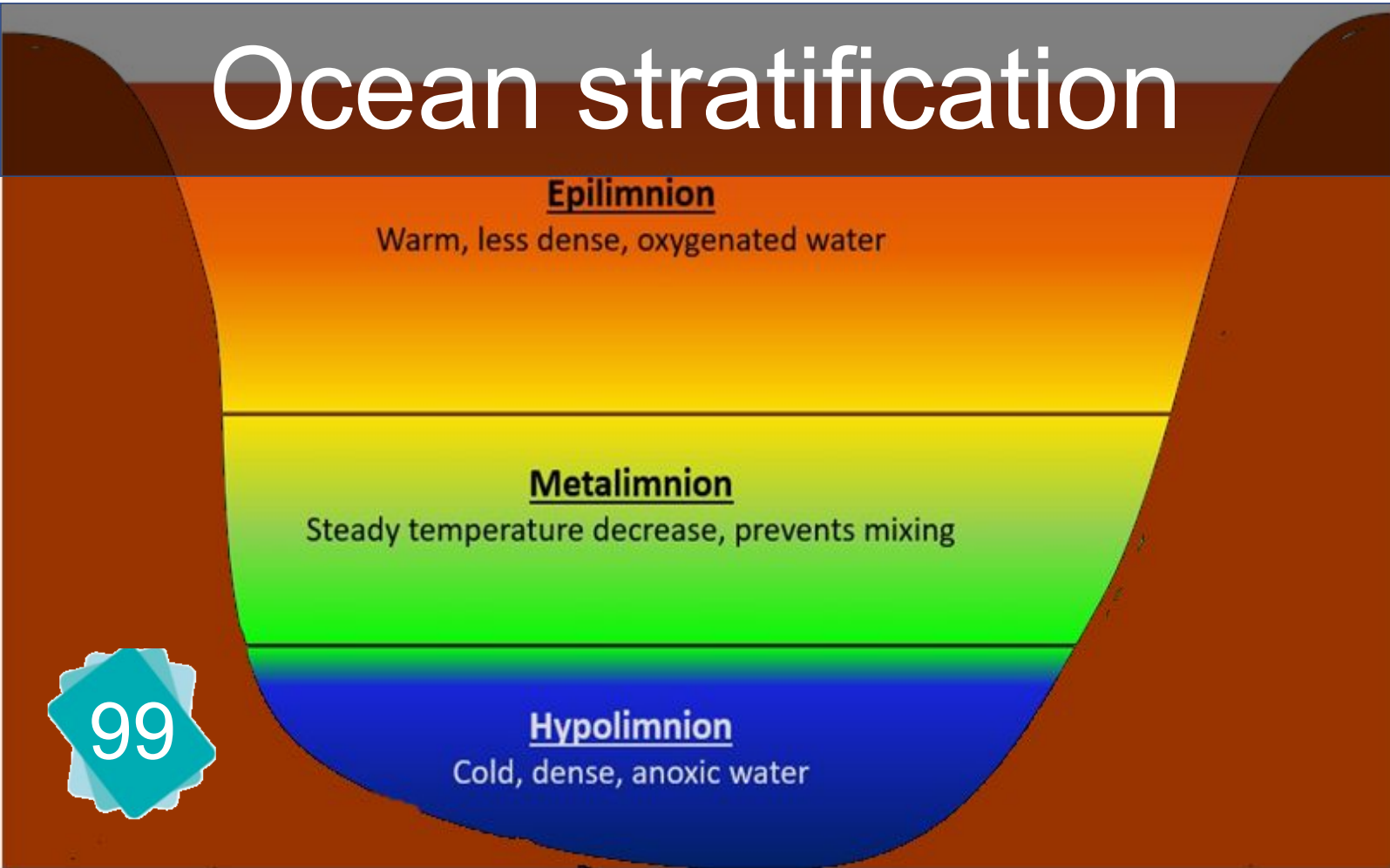
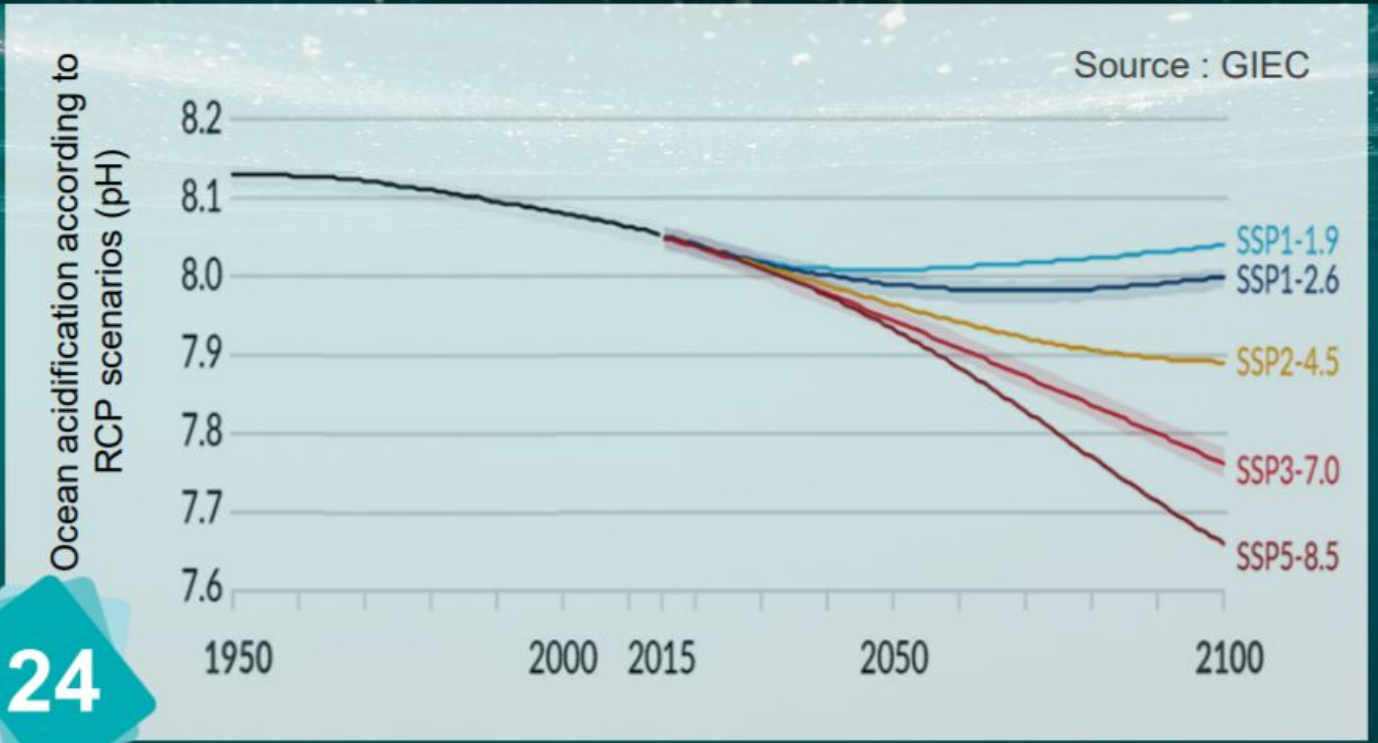
Human beings release a lot of harmful substances in the ocean. These pollutants mainly come from agriculture and industry. They are full of nitrate and phosphate and they cause algae and marine plants proliferation. This facilitates biological pumping.

Ocean stratification



Waters with different chemicophysical properties have trouble to mix. Hence, surface waters heat up and can’t pass absorbed CO2 to the depths. This phenomenon increase surface acidification. Moreover, the marine biodiversity is impacted by the vertical exchange reduction of sediments.

Ocean Acidification



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When CO_2 dissolves in the ocean, it turns into acid ions (H_2CO_3 and HCO_3-). This makes the oceans more acidic and the pH drops.

Set 2

Rising Water Temperatures

17

17

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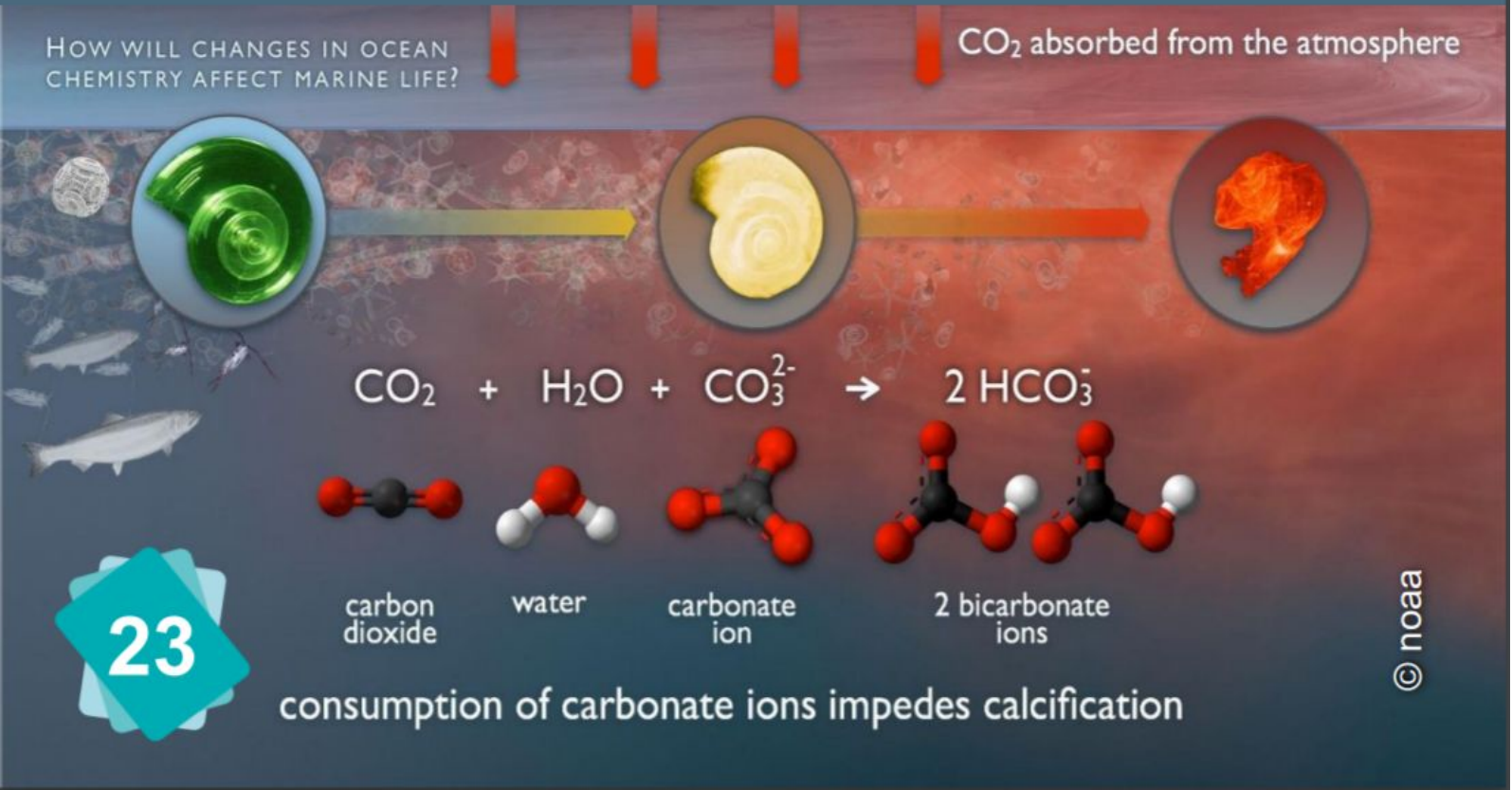
Oceans absorb 91% of the energy accumulated on Earth. The water temperature has therefore increased, especially close to the surface. Water expands as it warms.

Set 3

Calcification difficulties



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When the pH drops, it becomes harder for calcium carbonate seashells to grow.

Set 4

Marine Biodiversity

27

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Pteropods and coccolithophores are at the base of the ocean food chain. If they are driven to extinction, all marine biodiversity will be threatened. Warming ocean waters also threaten marine biodiversity.

Set 4