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'Acidifying oceans' threaten food supply, UK warns

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Acidification of the oceans affects marine life

Acidification of the oceans is a major threat to marine life and humanity's food supply, Hilary Benn is to warn as the UN climate summit resumes.

The UK environment secretary will say that acidification provides a "powerful incentive" to cut carbon emissions. Ocean chemistry is changing because water absorbs extra CO₂ from the air.

Some believe this could be as big an impact of rising CO₂ levels as climatic change, though it is rarely discussed within the UN climate convention.

The UN summit in Copenhagen, which started a week ago, is scheduled to conclude on Friday, when more than 100 world leaders will attend in an effort to agree a new global treaty on climate change.

'Really important'

OCEAN ACIDIFICATION

Up to 50% of the CO₂ released by burning fossil fuels over the past 200 years has been absorbed by the world's oceans

This has lowered the pH value of seawater - the measure of acidity and alkalinity - by 0.1

The vast majority of liquids lie between pH 0 (very acidic) and pH 14 (very alkaline); 7 is neutral

Seawater is mildly alkaline with a "natural" pH of about 8.2

The IPCC forecasts that ocean pH will fall by "between 0.14 and 0.35 units over the 21st Century, adding to the present fall of 0.1 units since pre-industrial times"

Natural lab shows sea's acid path

What is ocean acidification?

'Coral lab' offers acidity insight

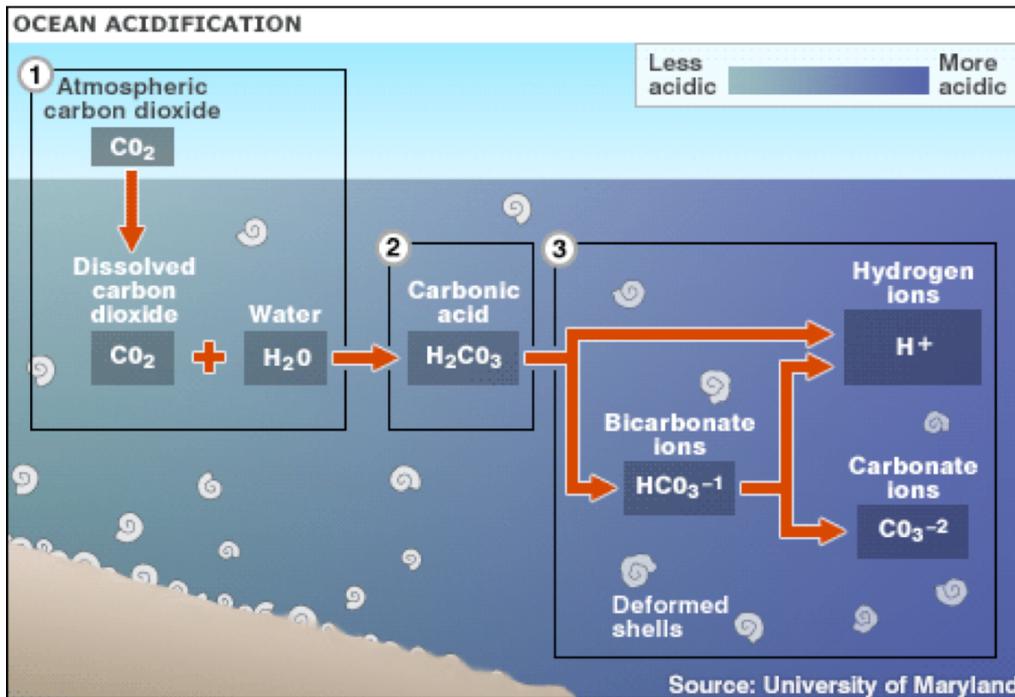
The science has come to prominence only within the last five or six years, and most of the details were not available when the convention was signed in 1992.

"We know that the increasing concentration of CO₂ [in the air] is making the oceans more acidic," Mr Benn told BBC News.

"It affects marine life, it affects coral, and that in turn could affect the amount of fish in the sea - and a billion people in the world depend on fish for their principal source of protein.

"It doesn't get as much attention as the other problems; it is really important."

In September, the UN-backed study into The Economics of Ecosystems and Biodiversity (Teeb) concluded that the widely-endorsed target of trying to stabilise atmospheric concentrations of CO₂ or their equivalent to around 450 parts per million (ppm) would prove lethal to much of the world's coral.



1. Up to one half of the carbon dioxide (CO_2) released by burning fossil fuels over the past 200 years has been absorbed by the world's oceans
2. Absorbed CO_2 in seawater (H_2O) forms carbonic acid (H_2CO_3), lowering the water's pH level and making it more acidic
3. This raises the hydrogen ion concentration in the water, and limits organisms' access to carbonate ions, which are needed to form hard parts

Mr Benn will be speaking during the summit's "oceans day" at a meeting organised by Stanford University and Scripps Institution of Oceanography, both based in California.

"Unlike global warming, which can manifest itself in nuanced, complex ways, the science of ocean acidification is unambiguous," said Andrew Dickson, a Scripps professor of marine chemistry.

"The chemical reactions that take place as increasing amounts of carbon dioxide are introduced to seawater have been established for nearly a century."

CLIMATE CHANGE GLOSSARY

Select a term from the dropdown:

Glossary
 Adaptation
 Annex I countries
 Annex II countries
 Anthropogenic climate change
 Aosis
 AR4
 Atmospheric aerosols
 Bali action plan
 Bali roadmap
 Baseline for cuts
 Biofuel
 Black carbon
 Boxer-Kerry bill
 Business as usual
 Cap and trade
 Carbon capture and storage (CCS)
 Carbon dioxide (CO_2)
 Carbon dioxide (CO_2) equivalent
 Carbon footprint
 Carbon intensity
 Carbon leakage
 Carbon neutral
 Carbon offsetting
 Carbon sequestration
 Carbon sink
 Certified Emission Reduction (CER)
 Clean Coal Technology
 Clean Development Mechanism (CDM)
 Climate change
 CFCCO2
 Commitment period
 COP15
 Country in transition
 Dangerous climate change
 Deforestation
 Emission Trading Scheme (ETS)
 EU Burden-sharing agreement
 Feedback loop
 Flexible mechanism
 Fossil_fuels
 Geological sequestration
 Global average temperature
 Global energy budget
 Global dimming
 Global warming
 Global Warming Potential (GWP)
 Greenhouse gases (GHGs)
 Greenhouse effect
 Hockey stick
 IPCC
 Joint implementation
 Kyoto Protocol
 LDCs
 LULUCF
 Major Economies Forum on Energy and Climate
 Methane
 Mitigation
 Nairobi work program
 Natural greenhouse effect
 Non-annex I countries
 Ocean acidification
 ppm (350/450)
 Per-capita emissions
 Pre-industrial levels of carbon dioxide
 REDD
 Renewable energy
 Stern review
 Technology transfer
 Tipping point
 Twenty-twenty-twenty (20-20-20)
 UNFCCC
 Waxman-Markey energy bill
 Weather

Suggest additions

Glossary in full

The oceans and atmosphere are constantly exchanging CO_2 .

Concentrations in the atmosphere are now about 30% higher than in pre-industrial times; a proportion of this is absorbed by seawater, which results in rising concentrations of carbonic acid.

As a result, the pH of seawater has fallen by about 0.1, and a further change of 0.3-0.4 is expected by the end of the century.

This is likely to affect the capacity of organisms including molluscs, coral and plankton to form "hard parts" of calcium carbonate.

A 2007 study showed that rates of coral growth on the Great Barrier Reef had fallen by 14% since 1990.

Mr Benn will say that the Intergovernmental Panel on Climate Change (IPCC) should investigate ocean acidification during its next major assessment of the Earth's climate, scheduled for release in 2013.