Global warming could suffocate the sea

* 18:00 25 January 2009 by Andy Coghlan
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Fish could vanish from huge stretches of the ocean for tens of thousands of years unless we drastically reduce our carbon emissions.

Gary Shaffer of the University of Copenhagen, Denmark, and his colleagues used computer models to analyse the long-term impact of global warming on the oceans, looking up to 100,000 years into the future. This is important because less oxygen dissolves in warmer water, affecting the amount of life the oceans can support.

To estimate just how much oxygen will be lost, the team used two existing scenarios of future fossil fuel burning published by the Intergovernmental Panel on Climate Change: a worst case scenario in which we burn three quarters of the Earth's fossil fuel reserves over the coming century, and a mid-range scenario in which we burn only a quarter of reserves. In both cases it is assumed that burning then stops.

Under the worst-case scenario, average ocean oxygen levels will fall by up to 40%, and there will be a 20-fold expansion in the area of "dead zones", like those already discovered in the eastern Pacific and northern Indian Ocean, where there is too little oxygen for fish to survive. Even in the mid-range scenario, dead zones would expand by a factor of 3 or 4. Cold, deep waters will also be affected if warming stifles the currents that deliver oxygen to greater depths.

Shaffer's projections suggest that the oxygen content in surface layers will dip to its lowest levels during the 22nd century, and in deep water a thousand years later. Recovery to pre-industrial levels will be very slow: "Even after 100,000 years, oxygen levels will only have recovered by around 90%," he says.

Journal reference: Nature Geoscience, DOI: 10.1038/NGEO420