Air-sea exchange of gases (including CO$_2$)

What is the issue?
Uptake of CO$_2$ by the ocean is a primary control on the level of greenhouse gases in the atmosphere, and hence a control on the climate.

What has happened and how confident?
The North Atlantic is the major store of dissolved CO$_2$ in the global ocean (Sabine et al., 2004) which has taken up about one quarter of the anthropogenic emissions of CO$_2$ in the last 200 years.

Recent evidence suggests that the flux of atmospheric CO$_2$ into the surface of the North Atlantic reduced in 2002–05 compared with that measured in 1994–95 (Schuster and Watson, 2007).

What might happen?
Uptake of CO$_2$ in the future will be strongly affected by changes in water temperature and significant changes in circulation and stratification of the upper ocean.

Are there any OSPAR regional differences?
The exchange of CO$_2$ differs between the open ocean and the shelf seas and between cold and warm waters. Where sea ice exists this will also have an impact on the exchange.

Go to the full QSR assessment report on impacts of climate change (publication number 463/2009)

References