

RAPID climate change

NERC will invest £20 million in the RAPID programme between 2001 and 2007. Some longer-term projects may extend beyond 2007. To see which organisations are involved in the programme, visit <http://rapid.nerc.ac.uk>.

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Further information

<http://rapid.nerc.ac.uk>

Other websites of interest

<http://www.clivar.org>
<http://psc.apl.washington.edu/search/ASOF.html>
<http://www.noclim.org/>
<http://asof.npolar.no/>
<http://www.tyndall.ac.uk/>
<http://www.met-office.gov.uk/research/hadleycentre/>

Thematic research programme

Blowing hot and cold

Could global warming gradually turn Britain into a country with a southern European climate? Or could we suddenly be plunged into a mini-ice age? Are both these scenarios valid? Why is everyone so hot under the collar about climate change? Surely it won't happen tomorrow?



In fact, climate can and does change rapidly. Over as little as 10-20 years we could see major changes. But what causes rapid switches in climate? Through the Natural Environment Research Council (NERC) Rapid Climate Change (RAPID) thematic programme scientists are investigating whether Western Europe could be shivering in the freezer or sweltering in the sauna.



'Current' climate

There's an underlying current influencing climate change in Western Europe – quite literally. For the past 11,000 years or so huge volumes of warm water circling through the Atlantic Ocean have helped maintain Europe's balmy summers and generally mild winters.

Currents in this 'thermohaline circulation' carry warm water north from the tropics, releasing heat to the atmosphere on the way. By the time these surface waters reach high latitudes, they have cooled. The density of the waters increases, helping them to sink to the depths and then flow back towards the equator. Global warming could have paradoxical effects on the climate of Western Europe. Overall warming could make it harder to form the cold dense water that returns towards the equator, and changes in rainfall and sea ice might alter salinity and so density. These effects could either shift, or weaken, or shut down the circulation so that less heat will be drawn northward. The effects of a warming world might be less in North West Europe, or the climate could even get cooler.

RAPID researchers are looking for early warning signs of a changing thermohaline circulation. A sudden strong cooling could be catastrophic for agriculture, fisheries, industry and housing as crops fail, fish stocks shift to colder-water species and heating and insulation costs rocket.

A window on the past

Scientists are also trying to learn more about previous rapid changes in climate in order to predict the future. They are using 'palaeo data' – information preserved in structures such as ice and sediments, tree rings and corals. For example, the remains of long-dead creatures trapped within layers of sediment on the ocean floor can tell us about conditions in the ocean when they died.



Simulating climate

Knowing about past climate, including periods of rapid change, helps researchers model the processes involved in climate change. If models accurately simulate historical climate, there is a strong basis for predicting potential rapid climate change over the next 100 years.

Related work elsewhere

RAPID research will have strong ties with a similar programme in Norway - NOClim (Norwegian Ocean Climate Project). Both programmes have arisen partly from discussions between the Prime Ministers of the UK and Norway. Work will also contribute to international programmes such as CLIVAR (Climate Variability and Predictability) and ASOF (Arctic/Subarctic Ocean Fluxes) and good links have been forged with the National Science Foundation in the United States. UK researchers will seek collaborations with scientists in the European Union. Within the UK, the Tyndall Centre for Climate Change (part-funded by NERC) is investigating the possible impacts of rapid climate change and potential strategies to cope with such change. The RAPID program has strong links with other organisations such as the Hadley Centre for Climate Prediction and Research at the Meteorological Office (funded by DEFRA).