Bleak first results from the world's largest climate change experiment

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Greenhouse gases could cause global temperatures to rise by more than double the maximum warming so far considered likely by the Inter-Governmental Panel on Climate Change (IPCC), according to results from the world's largest climate prediction experiment, published in the journal Nature this week.
The first results from climateprediction.net, a global experiment using computing time donated by the general public, show that average temperatures could eventually rise by up to 11°C - even if carbon dioxide levels in the atmosphere are limited to twice those found before the industrial revolution. Such levels are expected to be reached around the middle of this century unless deep cuts are made in greenhouse gas emissions.

Chief scientist for climateprediction.net, David Stainforth, from Oxford University said: "Our experiment shows that increased levels of greenhouse gases could have a much greater impact on climate than previously thought."

Climateprediction.net project coordinator, Dr. David Frame, said: "the possibility of such high responses to carbon dioxide in the atmosphere has profound implications. If the real world response were anywhere near the upper end of our range, even today's levels of greenhouse gases could already be dangerously high."

The project, funded by the Natural Environment Research Council, is ongoing and involves more than 95,000 people from 150 countries.

Schools, businesses and individuals across the globe can download the free software which incorporates the Met Office's climate model and runs in the background when their computers lie idle.

The programme runs through a climate scenario over the course of a few days or weeks, before automatically reporting results back to climate researchers at Oxford University and collaborating institutions worldwide, via the Internet.

Participants have simulated over four million model years and donated over 8,000 years of computing time, making climateprediction.net easily the world's largest climate modelling experiment, comfortably exceeding the processing capacity of the world's largest supercomputers. This allows the project to explore a wide range of uncertainties, picking up previously unidentified high-impact possibilities.

"Using the technique of distributed computing and the generous support of many thousands of individuals we have been able to carry out an experiment which would otherwise have been impossible," explained Dr. Andrew Martin of the Oxford e-Science Centre.

Scientists at Oxford are urging more people to become involved. Mr. Stainforth said, "Having found that these extreme responses are a realistic possibility, we need people's support more than ever to pin down the risk of such strong warming and understand its regional impacts."

"This ongoing project allows anyone to participate in science that affects us all," he added.

Professor Bob Spicer of the Open University, has developed extensive web-based educational materials around the project. He said, "Schools can run the software and build the experiment into science, geography

and maths lessons with help from our new teaching materials. And everyone can take part in the lively debates on our Internet discussion forum that has attracted more than 5,000 people."

In May the Open University will start a distance-learning course based on the project. Anyone can register and learn even more about simulating and predicting climate change.

Paper: The paper, 'Uncertainty in the predictions of the climate response to rising levels of greenhouse gases', appears in Nature, 27 January 2005, vol 433.

Source: Natural Environment Research Council (NERC)