April 2003

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Highlights

Highlights of GAO-03-25, a report to Congressional Requesters, House of Representatives

CLIMATE CHANGE

Information on Three Air Pollutants' Climate Effects and Emissions Trends

Why GAO Did This Study

Solar radiation is absorbed by the earth and is subsequently reemitted. The buildup of carbon dioxide and certain other gases in the earth's atmosphere traps some of that radiation. This is known as the greenhouse effect and is believed to contribute to a warming of the earth's climate. Concerns are growing that, in addition to carbon dioxide and other conventional greenhouse gases, certain air pollutants may affect the climate.

GAO was asked to examine (1) the extent of agreement among scientists regarding the effect on the climate of three air pollutants—black carbon (soot), ground-level ozone, and sulfate aerosols—and (2) seven countries' efforts to control these pollutants, trends in these substances in these countries over the past 2 decades, and estimates for the next decade. GAO was also asked to summarize the relationship between economic growth and environmental pollution.

The seven countries include four that are economically developed—Germany, Japan, the United Kingdom, and the United States—and three that are developing—China, India, and Mexico. These countries were chosen because they have large economies with a high potential to emit these pollutants.

The two federal agencies asked to comment generally agreed with the information presented in this report.

www.gao.gov/cgi-bin/getrpt?GAO-03-25.

To view the full report, including the scope and methodology, click on the link above. For more information, contact John B. Stephenson at (202) 512-3841.

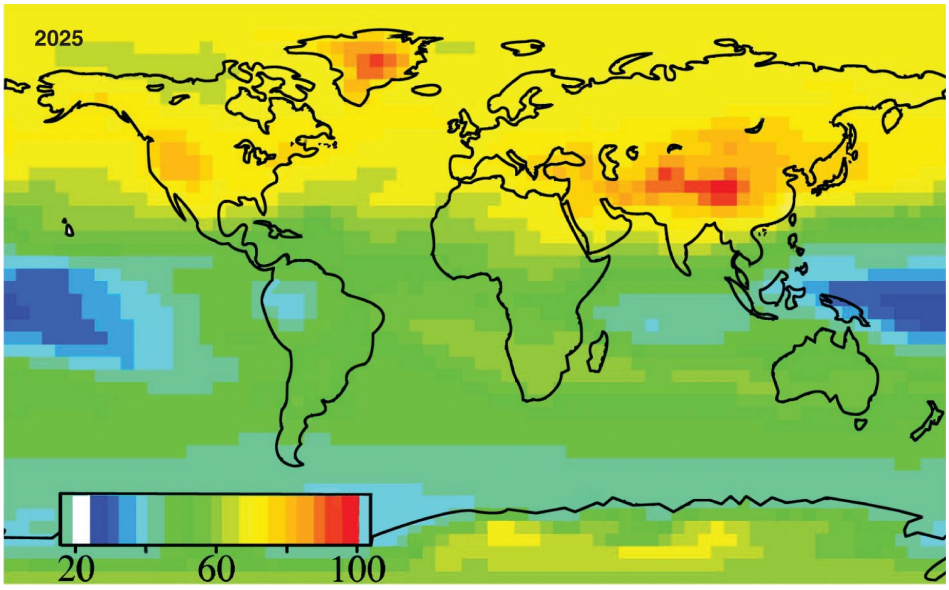
What GAO Found

Scientists generally agree that sulfate aerosols have a cooling effect on climate, while ozone in the lower atmosphere has a warming effect. Black carbon tends to warm the atmosphere but cool the earth's surface. Sulfate aerosols also affect how much and where it rains. Considerable uncertainty remains about the size of these effects.

All seven countries are taking steps to reduce the amounts of the three pollutants. The four economically developed countries have well-established efforts underway. In these countries, the amounts of the three substances generally declined over the last 2 decades and are expected to decline over the next decade. In contrast, the three developing countries' efforts are less well established. In these countries, the amounts of the three substances generally increased during the years for which information is available. GAO found few projections for these three countries.

An extensive body of research has examined the possible connection between economic development and environmental pollution, but the results of this research are inconclusive. Researchers also caution that economic growth by itself may help support environmental improvements but is not, by itself, sufficient to ensure them.

Projected Average Global Ozone Concentrations, Parts per Billion, 2025



Blue areas indicate low ozone concentrations

Yellow and red areas indicate high ozone concentrations

Source: L.J. Mickley, Harvard University.