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HEADLINE: Can Global Warming Be Studied Too Much?

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BODY:

On Tuesday, the Bush administration convenes a three-day meeting here to set its new agenda for research on climate change. But many climate experts who will attend say talking about more research will simply delay decisions that need to be made now to avert serious harm from global warming.

President Bush has called for a decade of research before anything beyond voluntary measures is used to stem tailpipe and smokestack emissions of heat-trapping gases that scientists say are contributing to global warming.

"When you're speeding down the road in your car, if you've got to turn around and go the other direction, the first thing is to slow down, then stop, then turn," said David K. Garman, the assistant secretary of energy for energy efficiency and renewable energy.

But many climate experts say the perennial need for more study can no longer justify further delays in emission cuts.

"Waiting 10 years to decide is itself a decision which may remove from the table certain options for stabilizing concentrations later," said Dr. Michael Oppenheimer, a professor of geosciences at Princeton.

For example, under today's rate of emissions growth, he and other experts say that certain losses are already probable, including dwindling of snow-dependent water supplies and global die-offs of vulnerable ecosystems like coral reefs, alpine meadows and certain coastal marshes.

Nevertheless, administration officials say further research is still necessary because scientists cannot say exactly what effects human activity will have on global climate and how dangerous they will be. It is worth taking the time to conduct more analysis at least to clarify the balance of environmental and economic risks, they say.

"Science rarely gives enough information to narrow policy choices to a single option, but it can clear away some of the underbrush," said Dr. John H. Marburger III, assistant to the president for science and technology.

Some energy and climate experts have run new kinds of analyses showing that there is still time to avoid the worst effects of climate change while also limiting economic costs involved with an abrupt shift from fossil fuels, the main source of the warming gases.

The meeting, involving hundreds of experts, will be the biggest public airing of arguments in many years.

Most scientists concur on the basics. Atmospheric levels of the heat-trapping gases, mainly carbon dioxide from burning coal and oil, have increased by more than a third since the start of the Industrial Revolution, and there is wide agreement that they will probably double from preindustrial concentration by the end of the century, driven by energy demands of developing countries.

International and American panels of experts have concluded that these gases have caused most of the warming trend over the last 50 years. But there is still a wide range of projections indicating how much warmer things may get, how storm and drought patterns may respond and what the effects will be on ecosystems, agriculture and health. These uncertainties are unlikely to be dispelled soon. But many climate experts say that some effects can reasonably be predicted and that prudence calls for more actior now.

Dr. Warren M. Washington, a senior scientist at the National Center for Atmospheric Research, likened the situation to the debate over smoking's link to cancer.

"Even with smoking, it's still basically a statistical thing," said Dr. Washington, who is chairman of the National Science Board, a panel that advises the White House and Congress. "But vested interests do not want to take action based on early indications, and with climate early indications is what we have."

If greenhouse gas concentrations double, climate experts expect substantial disruptions of ecosystems and water supplies, coastal damage as sea levels rise and intensified drought and downpour cycles. Even more calamitous surprises could lie in store, including disruptions in the Atlantic Ocean currents that help warm Europe.

The experts concede that they cannot say exactly what may happen, or when. Also, changes will probably occur slowly -- sea levels rising by millimeters a year, say -- so there will be no one event to prompt people to choose a fuel-saving hybrid car over a gas-guzzling S.U.V.

But the warming will have enormous momentum, they say. Unlike soot or sulfur pollution, which falls out of the atmosphere within days or weeks, molecules of carbon dioxide and other greenhouse gases can circulate for a century or more.

As a result, scientists say, allowing things to go on as they are is like making minimum payments on a credit card while still using it: the balance grows and grows.

In the long run, almost all experts agree, stabilizing carbon dioxide concentrations in the atmosphere wil be a century-plus process that will necessitate eliminating -- or capturing -- all releases of carbon dioxid from burning coal, oil and other fossil fuels.

That will require a fundamental shift to energy technologies that do not yet exist. But it also requires

emission cuts in the next decade or so, even as trends for such emissions are sharply up.

"We will probably need everything in the tool kit to cut emissions enough to stop the worst things from happening," said David D. Doniger, the director of climate policy for the Natural Resources Defense Council, a private group. "A long-term technology program is definitely in order, but we also need to be acting now with the technology available now."

But the Bush administration is resisting calls for quick action. Its focus on more research comes straight from the president. In his first speech on climate, in June 2001, Mr. Bush defended the need for more research by saying, "No one can say with any certainty what constitutes a dangerous level of warming, and therefore what level must be avoided."

In February, he reaffirmed the country's commitment to pursue the goal of a climate treaty his father signed in 1992: to stabilize greenhouse gas concentrations at a level that will prevent dangerous interference with the climate.

But he has rejected the instrument chosen by almost all other industrialized countries to start on a path toward that goal, the 1997 agreement called the Kyoto Protocol. It requires industrialized countries that submit to its terms to reduce greenhouse-gas emissions by 2012 to levels below those measured in 1990.

Instead, Mr. Bush calls for voluntary actions.

Ten years from now, if scientists still think climate change is worrisome, other strategies may follow, he said.

Although many climate experts say delays are risky, others, including Dr. James A. Edmonds of the Energy Department's Pacific Northwest National Laboratory, have calculated that Mr. Bush's timetable and prompter actions like the Kyoto treaty do not lead to significantly different outcomes in the long run The most critical challenge by far, he said, is the sharp decline in emissions in midcentury.

"We are still struggling with the 'what will be' question, especially at regional scales, which makes answering the 'what will be dangerous' question too difficult to handle," said one of these researchers, Dr. John R. Christy, the director of the Earth System Science Center at the University of Alabama in Huntsville.

As a result, he said, any emissions plan should be "economically benign."

The meeting this week is likely to see many clashes between the two camps, with more than 1,000 scientists, industry lobbyists, environmental campaigners and others planning to weigh in.

Sam Thernstrom, a spokesman for the White House Council on Environmental Quality, says the goal is to hear all views before the research plan is finished next spring and a series of two- to five-year projects is begun.

"Anyone who has quibbled with how this plan is put together," he said, "they and the rest of the world are invited to come on down and make suggestions. All ideas will be considered."

Those eager for more aggressive actions say they doubt the meeting will lead to significant policy shifts, particularly now that relevant Congressional committees are controlled by Republicans pushing for more not less, exploitation of fossil fuels.

They also say that the administration's 170-page research plan (available on the Web at www.climatescience.gov) includes no commitments that adequate money will flow to support new science.

To build a more convincing case for faster action, a growing group of researchers is trying new ways of conveying the risks of certain emissions paths, including pinpointing when actions have to start to stabilize greenhouse gases at particular levels.

The current concentration of carbon dioxide in the atmosphere is 370 parts per million, and the level before industrialization began was about 280 parts per million.

Under what is considered a best-case model, global annual emissions of carbon dioxide will have to start declining by 2020 to stabilize atmospheric carbon dioxide at 450 parts per million. Even at that level, there would probably be substantial losses, Dr. Oppenheimer and others say, including a global die-off c coral reefs.

Societies have probably already missed that turning point, scientists say, and the longer societies wait to act, the higher the eventual greenhouse plateau and the greater the consequences.

If emissions do not start declining until 2033, carbon dioxide concentrations will plateau at 550 parts pe million -- more than double preindustrial concentrations. That level raises the likelihood of more calamitous consequences, including intensified storm and drought cycles, wider extinction of species an perhaps the eventual freeing of the West Antarctic Ice Sheet, which could raise sea levels a century or two from now 15 feet or more, inundating coasts where most human settlements are concentrated.

In between these extremes, some climate experts and economists see a path that could avoid the worst environmental and economic risks. The problem is that this would depend on a fairly prompt start on emission reductions and aggressive research on finding new sources of nonpolluting energy.

There are other reasons for prompt action, experts say. One is that energy providers like power plant owners plan their investments in new equipment a decade or two ahead of time, said Dr. David G. Victor, the director of the energy and sustainable development program at Stanford.

Another problem with relying on more research, many climate experts say, is the presumption that the extra effort will reveal a "safe" level of greenhouse gases.

Better computer models and observations are likely to refine the menu of impacts, but reducing uncertainty still "doesn't necessarily provide what is needed by decision makers," said Dr. Roger A. Pielke Jr., an expert on environmental risk at the University of Colorado. Society as a whole must answer those questions, he and other scientists say.

"To avoid danger implies a threshold," said Dr. Henry D. Jacoby, an economist at the Massachusetts Institute of Technology and co-director of its program on the science and policy of global change. "But with climate, I don't believe there is one."

"There are so many different effects, in so many different countries, in so many different sectors, affecting so many different processes, affecting so many different people in so many different situations that there's not going to be a clearly defined break point," Dr. Jacoby said.

Dr. Jacoby likened the situation to a doctor-patient conference, when the patient learns that his high cholesterol puts him at risk for a heart attack.

"Is your next question 'Tell me exactly when my heart attack is coming and how serious it will be?' " Dr. Jacoby said. "No. You want to know what you can do about it now."

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CORRECTION-DATE: December 6, 2002, Friday

CORRECTION:
A label and a caption for a satellite image in Science Times on Tuesday with an article about the prospects for government action on climate change referred incorrectly to an area off the Bahamas where coral reefs are threatened by global warming. Most of the area, the Great Bahama Bank, is sand under shallow water. It is not entirely coral reef.

GRAPHIC: Photos: The light blue areas in this satellite image are coral reefs around the Bahama Islands. They are vulnerable to global warming. (NASA via Agence France-Presse); This satellite image shows the Larsen B ice shelf shattering and separating from the main ice sheet on March 21. Much bigger ice breakups are possible. (NASA via Associated Press)(pg. F1); Climate experts say greenhouse gas concentrations may cause coastal damage as sea levels rise. Countries like the Netherlands, above, are particularly vulnerable. (Reuters)(pg. F4)

Chart: "Acting Quickly to Avoid Catastrophe"
Many scientists believe that emissions of carbon dioxide and other greenhouse gases must start declining within a decade or two to stabilize concentrations in the atmosphere. The more delay, the bigger the potential harms, they say. The paths to two possible outcomes are shown below.

RISK: DIE-OFF OF CORAL REEFS
The first victims of warming are likely to be ecosystems, like coral reefs, that are already bumping against their tolerance for heat and climate change.

ACTION TO PRESERVE REEFS
Emission growth must be curbed, peaking in 2020 and falling afterward.

Graph tracks possible emission growth if no measures are taken in billions of tons per year.

RESULT -- Concentrations of carbon dioxide would level off at 450 parts per million by 2100. At this level, the reefs would still be threatened.

Graph tracks carbon dioxide levels from 2000 through 2300.

RISK: WEST ANTARCTIC ICE SHEET DISINTEGRATES
Possibly the worst consequence of warming, and least predictable. Its melting could cause sea levels to rise 15 feet or more.

ACTION TO PRESERVE ICE SHEET
Emission growth must be curbed, peaking in 2033 and falling afterward.

Graph tracks possible emission growth if no measures are taken in billions of tons.

RESULT -- Concentrations of greenhouse gases would level off at 550 parts per million by 2150. Around this level, the risk of destabilizing the ice sheet rises.

Graph tracks greeenhouse gases levels from 2000 through 2300.

(Sources: Nature for chart data ; Dr. Michael Oppenheimer, Princeton University)

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