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RELEASE: 08-222

REPORT EXPLORES USE OF EARTH DATA TO SUPPORT NATIONAL PRIORITIES

WASHINGTON -- The nation faces challenges in utilizing Earth science information to manage resources and protect public health, according to a NASA-sponsored report issued Monday by the U.S. Climate Change Science Program.

The report examines the computer-based decision support tools that many government agencies use to make predictions and forecasts in areas such as agricultural productivity, air quality, renewable energy resources, water management, and the prevention of vector-borne disease.

The authors of "Uses and Limitations of Observations, Data, Forecasts, and Other Projections in Decision Support for Selected Sectors and Regions" found that while these tools have successfully incorporated Earth science information to address a number of issues, they are not yet widely used to investigate the implications of future climate change.

The report is the latest in a series of "synthesis and assessment products" by the U.S. Climate Change Science Program to address various aspects of the country's highest priority research, observation and decision support needs. The study's authors include experts from government, universities and non-governmental organizations.

New sources of Earth information and advances in computing, modeling and analysis systems provide government agencies with new capabilities to enhance the way they manage resources and evaluate policy alternatives that affect local, national and international actions.

"All of the information we have now about Earth's climate, water, air, land, and other dynamic processes is essential for understanding humankind's relationship to natural resources and our environment," said Molly Macauley of Resources for the Future in Washington, one of the report's lead authors. "We hope this report will give decision-makers a greater understanding of the valuable information resources available to them."

The study examines a broad range of decision support tools that have the potential to address climate change impacts. The authors selected five for in-depth review. The tools are currently in use at the Department of Agriculture, the Environmental Protection Agency,

the Department of Energy, the Centers for Disease Control and Prevention, the Department of Interior, and the Army Corps of Engineers.

Four of the tools examined - in the areas of agricultural efficiency, air quality, water management, and energy management - are well-established as a basis for public policy decision making, according to the report. However, the use of Earth information in public health decisions, such as the system developed to prevent the spread of Lyme disease in the United States, is a relatively new application area.

One of the major challenges facing increased use of Earth information for decision making is accounting for the degree of uncertainty in the results of these systems. Like all computer models and data, there are many sources of uncertainty, including the accuracy of the data as well as assumptions in the modeling that underlie the decision-support tools. The report found that with all the tools investigated, the agencies are using various methods to understand the effects of uncertainty and clearly communicate the confidence levels of the information they produce.

The availability of data is also a limitation. For example, a challenge for the Department of Energy's model - used to decide where to build renewable energy technologies - is the lack of direct measurements of wind and solar radiation in specific locations. Incorporation of more satellite-based Earth data in all of the decision-support systems is hampered by the fact much of the data is from short-term research missions that do not guarantee the type of long-term delivery of data to users as operational systems.

The report concludes the value of these tools for forecasting impacts of a changing climate is largely unexplored. "Most of the agencies in this report have not yet made extensive use of climate change information, or used their decision tools to study the effect of a changing climate on the resources they manage," Macauley said.

Of the five systems evaluated, only the U.S. Centers for Disease Control and Prevention's Lyme disease prevention system has explicitly evaluated the potential impact of climate change scenarios. None of the other systems are directly integrated with climate change measurements, but all can and may in the future take this step, according to the study.

Federal agencies contributing to the report include the Department of Energy, the Environmental Protection Agency, the National Oceanic and Atmospheric Administration, the U.S. Agency for International Development, and the U.S. Geological Survey.

The complete report is available on the Web at:

http://www.climatescience.gov/Library/sap/sap5-1/final-report/default.htm

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