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United States Government Accountability Office
Washington, DC 20548

April 14, 2005

The Honorable John McCain
The Honorable John F. Kerry
United States Senate

Subject: *Climate Change Assessment: Administration Did Not Meet Reporting Deadline*

For many years, scientists have observed a warming trend in the earth's climate and have projected additional changes in the coming decades, with potential implications for human society. To provide for the development and coordination of a comprehensive and integrated U.S. research program that will assist the nation and the world in understanding, assessing, predicting, and responding to such changes, the Congress, in the Global Change Research Act of 1990 (act), required the administration to, among other things, prepare a national global change research plan, a summary of the achievements and expenditures in the area of federal climate change research, and a scientific assessment. The scientific assessment is to be prepared at least every 4 years and is to

- (1) integrate, evaluate, and interpret research findings on climate change of the Global Change Research Program (implemented under the Global Change Research Plan) and scientific uncertainties associated with such findings;
- (2) analyze the effects of global change on the natural environment, human health and welfare, and other specified areas; and
- (3) analyze current trends in global change and project major trends for the next 25 to 100 years.

The first scientific assessment under the act was completed in November 2000, when the Office of Science and Technology Policy (OSTP) in the Executive Office of the President¹ transmitted to the Congress a 600-plus page report entitled *Climate*

¹OSTP submitted the assessment, which was prepared by the National Assessment Synthesis Team, a committee of experts.

Change Impacts on the United States: The Potential Consequences of Climate Variability and Change. The report sought to identify the key climatic vulnerabilities of particular regions of the country and sectors of the economy in the context of other changes in the nation's environment, resources, and economy. In addition to the full report, the administration published a 154-page summary of the findings for a more general audience. Detailed reports were also published on the possible impacts of climate change on specific regions and the possible effects of climate change on various environmental, economic, and social sectors. Some of these reports were published after November 2000, the final one in 2003.

In 2002, the President announced the creation of the interagency Climate Change Science Program (CCSP) to coordinate and direct U.S. research efforts in the area of climate change. CCSP is now responsible for producing and submitting the climate change assessment and is led by the Assistant Secretary for Oceans and Atmosphere at the Department of Commerce. In July 2003, CCSP's strategic plan was transmitted to the Congress. The strategic plan contained a schedule for preparing the next assessment by publishing 21 reports, each focusing on a specific topic.

The act also requires preparation of a national global change research plan. In 2002, under the auspices of CCSP, 13 federal departments and agencies contributed to the drafting of such a plan, and in December 2002, CCSP held a climate science workshop in Washington, D.C., at which climate scientists and other information users provided comments and suggestions on the draft plan. At CCSP's request, under an agreement called for in the act, the National Academy of Sciences-National Research Council convened an expert committee to review the draft. According to the committee's February 2003 review of CCSP's draft strategic plan, the draft plan was not likely to produce deliverables, such as written reports, within 4 years. In response, CCSP officials developed a set of potential research topics that they believed would both satisfy the need for deliverables and meet the act's reporting requirements. These research topics were subsequently reduced to 21 topics, which became the foundation of the current assessment.

You asked us to evaluate the extent to which CCSP's planned assessment meets the requirements of the act regarding the timing and content of such an assessment. In conducting our work, we reviewed and analyzed the act, its legislative history, and agency documents. We also interviewed the CCSP Director and other Department of Commerce officials. We conducted our work between June 2004 and February 2005 in accordance with generally accepted government auditing standards.

CCSP Did Not Submit an Assessment in 2004, as Required

CCSP did not submit a scientific assessment in November 2004, 4 years after the previous assessment, as required by the act. Instead, CCSP's July 2003 schedule called for issuing 21 shorter reports between 2005 and 2007. According to that schedule, the first 9 reports are due on or before September 30, 2005, and the other 12 are due on or before September 30, 2007. Thus, by the time the last of these reports is

published, about 7 years will have elapsed since the publication of the 2000 report—nearly twice the interval specified in the act. Further, the CCSP Director told us that he was not certain that even the first 9 reports would be published in accordance with this planned schedule. Of these 9 reports, a specific timeline is in place for only the first report, and that report is on schedule. For 3 other reports, draft prospectuses, the first step in the writing process, have been released for public comment, but for the remaining 5 reports, originally planned for September 2005, no prospectuses had been published as of February 2005. Those reports are now expected to be completed up to a year later than planned, September 2006. The remaining 12 reports are currently expected to be completed by September 2007, according to the CCSP Strategic Plan. The Director said the completion of these 12 reports would be affected to some extent by the delay in issuing the first 9 reports, but the delay would be less than 12 months.

According to the CCSP Director, work on the reports was delayed for three reasons: (1) the CCSP Committee, consisting of senior members of 13 federal departments and agencies overseen by three entities of the Executive Office of the President, underestimated the complexity and scope of the work involved to produce the reports; (2) the guidelines for preparing the assessment were delayed as a result of extensive legal discussions that included discussions about compliance with the Data Quality Act and Office of Management and Budget guidance on peer review; and (3) the director was severely ill for the better part of a year when the assessment was getting started, which slowed early momentum.

The CCSP Director also told us that, considering the number of advancements in science and technology today compared with 1990, 4 years may not be enough time to complete a comprehensive assessment, such as that called for under the act. Further, over the past decade and a half, federally sponsored climate research has greatly expanded. For example, in fiscal year 1991, 9 agencies spent \$954 million on climate change science, compared with fiscal year 2004, when 12 agencies spent about \$2 billion on climate change science. This has increased the burden of analyzing and synthesizing all of the research. The director also noted that the Intergovernmental Panel on Climate Change, an international body that assesses scientific, technical, and socio-economic information on climate change, uses a 7-year reporting cycle.

Unclear How CCSP's Planned Reports Will Explicitly Address All Required Assessment Topics

It is unclear how the 21 reports proposed in CCSP's July 2003 strategic plan will address all three of the components of the assessment required under the act. The planned report topics generally appear to focus on either of these components: (1) the evaluation and interpretation of research findings on climate change and associated scientific uncertainties or (2) the analysis of current trends in global change and projection of major trends. (See the enclosure for the planned reports and their estimated publication dates.) However, CCSP has no comparable explicit plan for addressing the other major required component, assessing the effects of global change on the eight areas enumerated in the act: the natural environment, agriculture, energy production and use, land and water resources, transportation,

human health and welfare, human social systems, and biological diversity. The National Academy of Sciences-National Research Council noted in its February 2004 review of the final CCSP strategic plan that, “The purpose of the plan’s proposed [reports] must also be clarified, because it is unclear whether they ... will ... meet the 1990 Global Change Research Act requirement for impact assessments....” The Council noted that “...some areas specified in the Act, such as analyzing the effects on energy production and use, human health and welfare, and human social systems, are only peripherally addressed by this portfolio of products. Not a single [report] explicitly addresses the nation’s water supply.”

CCSP officials agreed that some of the required topics are not explicitly included on the current list of planned reports, but told us that they are committed to reporting on all eight areas and are considering using various means of doing so. For example, a Commerce Department senior counsel said that as the authors of the 21 reports prepare their outlines, they will be asked to document how they intend to respond to the act and will have the opportunity to modify or extend their reports’ coverage. Moreover, the CCSP Director noted that additional reports could be commissioned if necessary to cover any assessment areas not otherwise addressed. However, we believe that, without a well-developed plan that links the reports to the eight assessment areas—and especially because the currently planned reports will be issued over a 3-year period—the Congress and other users will not know how, when, and where the eight areas will be addressed. Further, the CCSP Director stated that there are currently no plans to integrate and summarize the findings of the 21 individual reports into a single volume, as was done in 2000.

Conclusions

The 4-year interval between assessments, which was established 15 years ago, may not allow sufficient time for CCSP to prepare an assessment that meets all of the act’s requirements. We believe that, if the deadline cannot be met for any future assessments, the CCSP Director should recommend that the CCSP interagency committee request an extension from the Congress.

CCSP’s approach for reporting on the eight assessment areas contrasts with its more structured approach for addressing scientific uncertainties and trends. Without a well-developed plan for how it will address the eight assessment areas—and especially because the currently planned reports will be issued over a period of 3 or more years—the Congress and other users will not know when and where all of the issues will be addressed or whether the reports meet the requirements established by the act. Accordingly, we believe that a well-developed plan for addressing all eight assessment areas would provide assurance to the Congress and others on when and where all eight areas will be covered.

Because the 21 individual reports are planned to address scientific uncertainties associated with climate change and other technical subjects and are to be issued over a period of 3 or more years, it may be difficult for the Congress and others to use this information effectively as the basis for making decisions on climate policy. We

believe it would be helpful to the Congress and other users if CCSP summarized the 21 reports in a single volume for a general audience, as was done in 2000.

Recommendations

To ensure that the climate change assessments required under the Global Change Research Act of 1990 present information in a manner that is most useful for the Congress and the public, we recommend that the CCSP director take the following three actions:

- develop plans to prepare the next assessment within the prescribed time frame, or if 4 years are insufficient to complete the assessment, recommend to the CCSP interagency Committee that CCSP request an extension from the Congress;
- develop a specific plan to address all eight of the assessment areas; and
- recommend to the CCSP interagency Committee that a summary report be prepared to integrate the findings of the 21 or more individual reports.

Agency Comments and Our Evaluation

We provided the Assistant Secretary of Commerce for Oceans and Atmosphere, who also serves as the Director, CCSP, with a draft of this report for review and comment. He generally agreed with our recommendations, but he provided no specific information on whether and when he intends to develop a plan that addresses all eight assessment areas. We continue to believe that such a plan should be developed. The Director also provided technical comments, which we incorporated. His comments and our response are included in enclosure II.

As agreed with your offices, we plan no further distribution of this report until 30 days after the date of this report. At that time, we will send copies to the Director, CCSP, and other interested officials. The report will also be available on GAO's home

page at <http://www.gao.gov>. If you have questions, please contact me or David Marwick at (202) 512-3841. Anne K. Johnson was the major contributor to this report. John Delicath and Amy Webbink also made important contributions.

A handwritten signature in black ink, reading "John B. Stephenson". The signature is written in a cursive style with a long horizontal line extending to the right.

John B. Stephenson
Director, Natural Resources and
Environment

Enclosures - 2

Enclosure I

Planned Reports on Topics Related to Climate Uncertainty

In its July 2003 strategic plan, CCSP identified five broad research goals for climate change, shown in the table below. Under each goal are the specific topics, 21 in all, that will comprise the national assessment.

	Estimated completion date (starting Oct. 2003)	Report topics
Reports that extend knowledge of the Earth's past and present climate and environment, including its natural variability, and improve understanding of the causes of observed changes.		
1	Within 2 years	Temperature trends in the lower atmosphere -- steps for understanding and reconciling differences.
2	Within 2 years	Past climate variability and change in the Arctic and at high latitudes.
3	2-4 years	Re-analyses of historical climate data for key atmospheric features. Implications for attribution of causes of observed change.
Reports that improve quantification of the forces bringing about changes in the Earth's climate and related systems.		
4	Within 2 years	Updating scenarios of greenhouse gas emissions and concentrations, in collaboration with the Climate Change Technology Program (CCTP). Review of integrated scenario development and application.
5	Within 2 years	North American carbon budget and implications for the global carbon cycle.
6	2-4 years	Aerosol properties and their impacts on climate.
7	2-4 years	Trends in emissions of ozone-depleting substances, ozone layer recovery, and implications for ultraviolet radiation exposure and climate change.
Reports that reduce uncertainty in projections of how the Earth's climate and related systems may change in the future.		
8	Within 2 years	Climate models and their uses and limitations, including sensitivity, feedbacks, and uncertainty analysis.
9	2-4 years	Climate projections for research and assessment based on emissions scenarios developed through CCTP.
10	2-4 years	Climate extremes, including documentation of current extremes. Prospects for improving projections.
11	2-4 years	Risks of abrupt changes in global climate.
Reports that improve understanding of the sensitivity and adaptability of different natural and managed ecosystems and human systems to climate and related global changes.		

12	Within 2 years	Coastal elevation and sensitivity to sea-level rise.
13	2-4 years	State-of-knowledge of thresholds of change that could lead to discontinuities (sudden changes) in some ecosystems and climate-sensitive resources.
14	2-4 years	Relationship between observed ecosystem changes and climate change.
15	2-4 years	Preliminary review of adaptation options for climate-sensitive ecosystems and resources.
16	2-4 years	Scenario-based analysis of the climatological, environmental, resource, technological, and economic implications of different atmospheric concentrations of greenhouse gases.
17	2-4 years	State-of-the-science of socioeconomic and environmental impacts of climate variability.
18	2-4 years	Within the transportation sector, a summary of climate change and variability sensitivities, potential impacts, and response options.
Reports that explore the uses and identify the limits of evolving knowledge to manage risks and opportunities related to climate variability and change.		
19	Within 2 years	Uses and limitations of observations, data, forecasts, and other projections in decision support for selected sectors and regions.
20	Within 2 years	Best practice approaches for characterizing, communicating, and incorporating scientific uncertainty in decision-making.
21	Within 2 years	Decision support experiments and evaluations using seasonal to inter-annual forecasts and observational data.

Source: Climate Change Science Program.

Enclosure II

Comments from the Department of Commerce



UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary of Commerce
for Oceans and Atmosphere
Washington, D.C. 20230

APR -4 2005

Mr. John B. Stephenson
Director, Natural Resources and
Environment
United States General Accounting Office
Washington, D.C. 20548

Dear Mr. Stephenson:

Thank you for the opportunity to review and comment on the General Accounting Office's draft report entitled: *Climate Change Assessment: Administration Did Not Submit Assessment When Required and Needs Well-Developed Plan to Meet Content Requirements* (GAO-05-338R). The National Oceanic and Atmospheric Administration's comments on the draft report are enclosed.

These comments were prepared in accordance with the Office of Management and Budget Circular A-50.

Sincerely,

A handwritten signature in black ink that reads "James R. Mahoney".

James R. Mahoney, Ph.D.
Assistant Secretary of Commerce
for Oceans and Atmosphere

Enclosure

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THE DEPUTY ADMINISTRATOR



**DOC/CCSP Comments on the Draft GAO Report Entitled
“Climate Change Assessment: Administration Did Not Submit Assessment When
Required and Needs Well-Developed Plan to Meet Content Requirements”
(GAO-05-338R /April 2004)**

General Comments

The report on the Climate Change Assessment does an adequate job in representing the status of production of the climate change assessment, which is a requirement in 1990 Global Change Research Act (GCRA). Although the assessment is being developed and is not yet complete, the GAO report does recognize the four-year interval between assessments, established 15 years ago by the GCRA, may not be sufficient time to prepare an assessment meeting all of the Act’s requirements. The GAO report also correctly characterizes the challenges faced by the Climate Change Science Program (CCSP) in producing this assessment.

Recommended Changes for Factual/Technical Information

See comment 1.

Page 1, bullet (1), lines 1 and 2:

The name of the program is Global Change Research Program. “Change” was not included and should be added.

See comment 2.

Page 3, lines 2 and 3:

There was never a concrete number (30) of potential research topics cited or confirmed. Remove the reference to “30” in lines 2 and 3.

See comment 3.

Page 5, first paragraph, lines 3 and 4:

The report mentions the “third” major component and goes on to describe the contents of that component. The description in the following lines (lines 4-7) actually refers to the “second” major component in Section 106 of the GCRA. Replace “third” with “second.”

Editorial Comments

None

DOC/CCSP Response to GAO Recommendations

The GAO states, “...we recommend that the CCSP Director take the following three actions:”

Recommendation 1: “Develop plans to prepare the next assessment within the prescribed time frame, or if 4 years are insufficient to complete the assessment, recommend to the CCSP interagency committee that CCSP request an extension from the Congress.”

DOC/CCSP Response: DOC/CCSP agrees with this recommendation. CCSP will determine the necessary time frame required to meet the assessment requirements of the Act, taking into account the schedule of report production for the prior assessment (between late 2000 and 2003) and the anticipated schedule for the 21 Synthesis and Assessment products. CCSP will request an extension from Congress, if necessary. It took the previous Administration nearly a decade to issue the first element of its first assessment (November 2000) after the Act came into effect in 1990. And even then, the more detailed, significant reports were published as late as 2003. This is a sure indication the complexity of the effort envisioned by Congress cannot be reasonably accomplished within four years. CCSP believes the approach and timeline it has outlined with the 21 Synthesis and Assessment products being released on a rolling basis and updated every four years represents an essential and prudent balance of quality and timeliness.

See comment 4.

Recommendation 2: Develop a specific plan to address all eight of the assessment areas.

DOC/CCSP Response: DOC/CCSP agrees with this recommendation. The dissemination of the Synthesis and Assessment reports will provide a snapshot of knowledge of the environmental and socio-economic aspects of climate variability and change. We are engaging the National Academy of Sciences – National Research Council to provide advice on the relevant aspects of the Climate Change Science Program, including recommendations on areas needing further emphasis. Moreover, the lead authors of the reports will be asked to document how their efforts address one or more assessment areas of the Act as they develop their prospectuses and will have the opportunity to modify or extend their report’s coverage, if needed. We may also commission additional reports, if needed, to cover specific topics found to be insufficiently addressed.

Recommendation 3: Recommend to the interagency CCSP Committee that a summary report be prepared to integrate the findings of the 21 or more individual reports.

DOC/CCSP Response: DOC/CCSP is committed to provide policy-relevant summary information within each product. As the reports are staggered, we will consider the practicality and utility of also providing an overall summary at a single point in time.

GAO's Comments

The following are GAO's comments on the Department of Commerce letter dated April 4, 2005.

1. We revised the text to include the word "Change," as suggested.
2. We deleted the number 30, as suggested.
3. We revised the text, as suggested, replacing the word "third" with the word "other."
4. Although the Director, CCSP, stated that he agrees with our recommendation, he did not provide specific information on whether and when a specific plan will be developed to address all eight assessment areas. We continue to believe that such a plan should be developed.

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