



Highlights of a
FORUM

Jointly convened by the
**Comptroller General of
the United States**

**and the National Academy
of Sciences**

**MEASURING OUR
NATION'S NATURAL
RESOURCES AND
ENVIRONMENTAL
SUSTAINABILITY**

October 2007

GAO-08-127SP



Highlights of [GAO-08-127SP](#), a GAO and NAS forum

Why GAO Convened This Forum

One of the greatest challenges facing the United States in the 21st century is sustaining our natural resources and safeguarding our environmental assets for future generations while promoting economic growth and maintaining our quality of life. To manage natural resources effectively and efficiently, policymakers need information and methods to analyze the dynamic interplay between the economy and the environment.

Enhancing the information to make sound decisions can be facilitated by developing national environmental accounts. These accounts provide a framework for organizing information on the status, use, and value of natural resources and environmental assets, as well as on expenditures on environmental protection and resource management. While many countries have developed and are using environmental accounts, the United States lags behind.

GAO and the National Academy of Sciences (NAS) convened this forum to discuss developing accounts in the United States. Participants included U.S. federal agency officials and national and international statistical, energy, environment, and natural resource experts. Comments expressed do not necessarily represent the views of any one participant or the organizations that these participants represent, including GAO and NAS.

www.gao.gov/cgi-bin/getrpt?GAO-08-127SP.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Robert Robinson at (202) 512-3841 or robinsonr@gao.gov.

HIGHLIGHTS OF A GAO/NAS FORUM

Measuring Our Nation's Natural Resources and Environmental Sustainability

What Participants Said

Forum participants discussed potential criteria to help in developing environmental accounts, lessons learned from the international community, and strategies for overcoming challenges. Participants also made general observations about developing these accounts and discussed next steps.

Suggested Criteria to Help in Developing Environmental Accounts

Participants suggested four broad criteria to use in determining what components of environmental accounting should be developed. These criteria were identifying the objective of the accounts, considering the availability and quality of data, ensuring that accounts provide information on current natural wealth, and considering the timeliness and regularity with which accounts can be produced. Participants generally agreed that pollution and material flow accounts, which provide industry-level information about the generation of pollutants and solid waste and energy and material use, are most critical for the United States to develop first.

Lessons Learned from the International Community

Participants shared the following lessons learned from other countries' experiences in developing environmental accounts:

- *Provide data in a timely manner.* To be useful to decision makers, environmental accounting data must be timely.
- *Political interest can wax and wane.* Shifting political agendas can affect policymakers' interest in environmental accounting.
- *Environmental accounting is a long-term investment.* Developing accounts requires a sustained effort over an extended period.

Strategies for Overcoming Key Challenges

Participants broadly agreed that the greatest challenge to developing environmental accounts in the United States is the need for support from policymakers and others. Other key challenges include institutional differences based on agencies' varying missions; the need for funding; data availability, compatibility, and reliability; and methodological uncertainty. Participants suggested the following strategies, among others, for overcoming these challenges:

- Identify policymakers, experts, and others who support the effort.
- Build an economic business case for environmental accounting.
- Use an incremental approach.
- Take the time necessary to develop high quality accounts.

General Observations and Next Steps

Participants generally agreed that developing environmental accounts is important for both our nation's environmental and economic sustainability. Several participants offered to be partners in an effort to develop U.S. environmental accounts but noted that they would need congressional support and a designated lead agency to spearhead the effort.

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Abbreviations

BEA	Bureau of Economic Analysis
GDP	gross domestic product
NAMEA	National Accounting Matrix including Environmental Accounts
NAS	National Academy of Sciences
OECD	Organisation for Economic Co-operation and Development
SEEA 2003	<i>Handbook of National Accounting: Integrated Environmental and Economic Accounting 2003</i>
UN	United Nations
UNCEEA	United Nations Committee of Experts on Environmental-Economic Accounting

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United States Government Accountability Office
Washington, DC 20548

Introduction from the Comptroller General of the United States

The United States faces a range of challenges to its continued security and prosperity in the 21st century. Widely discussed examples of these challenges include a growing fiscal imbalance driven by ballooning entitlement expenditures for Social Security, Medicare, and Medicaid and a health care system that many experts believe is already in crisis. Another important 21st century challenge is sustaining our natural resources and safeguarding our environmental assets for future generations while promoting economic growth and maintaining a high relative quality of life. A critical first step to addressing this challenge is to ensure that sufficient and reliable information exists to take stock of current conditions, set goals, and measure progress.

Currently, policymakers lack the information needed to understand the potential environmental impacts of their decisions and the economic implications of changes to the environment and our natural resources. In contrast, based on decades of development and refinement, a wealth of information is available about production and income in the national economic accounts. These accounts provide policymakers with key national economic indicators, such as growth in health care spending and the change in economic investment, that help policymakers understand the state of the economy, monitor trends, and make projections that inform policy debates. Based in part on the data in the national economic accounts, policymakers can choose whether and how to take action to influence economic conditions. However, there are no comparable national environmental accounts even though the environment and our natural assets influence our economic condition and collective well-being. While environmental data are collected at various national and subnational levels, limitations in the data diminish its value to policymakers. The data are incomplete, vary in quality, and often are not comparable, resulting in a lack of key national environmental indicators to comprehensively understand the state of the environment or how it is changing over time.

Consequently, decisions are made with inadequate information about potential environmental impacts and economic or social consequences. For example, Hurricane Katrina caused massive devastation, including the loss of over 1,300 lives and billions of dollars in property damage, in part, because the wetlands that would have served as natural buffers to the storm had been lost to development. Better information on the wetlands' value to the economy could potentially have resulted in decisions that would have reduced the damage caused by the hurricane.

The United Nations (UN), the Organisation for Economic Co-operation and Development (OECD), and other international institutions have recommended that countries develop environmental accounts. Environmental accounts provide a framework for collecting and organizing information on the status, use, and value of the nation's natural resources and environmental assets, as well as on expenditures on environmental protection and resource management. To support the development of such accounts, the UN, European Commission, International Monetary Fund, OECD, and the World Bank issued a handbook in 2003 for use by both national and international agencies for compiling environmental accounts reflecting their information needs and priorities.¹ This handbook describes the following four components of environmental accounting:

- Natural resource asset accounts, which primarily include information on stocks of natural resources.
- Pollution and material flow accounts, which provide information at the industry level about the use of energy and materials and the generation of pollutants and solid waste.
- Environmental protection and resource management expenditure accounts, which identify expenditures made by industry, government, and households to protect the environment or manage resources.
- Environmentally adjusted macroeconomic aggregates, which include indicators of sustainability, such as an environmentally adjusted net domestic product.

Many industrialized countries, such as Australia, Canada, and France, and some developing countries, including Namibia and the Philippines, have developed some components of environmental accounting and continue to refine their accounts. For example, to better understand how to make the most of Australia's limited water resources, the Australian Bureau of Statistics and the National Water Commission have produced three water accounts since 2000 that track the supply and use of water in the Australian economy. In addition, since the early 1990s, Canada has annually produced environmental accounts, which have been used, among other things, to develop environment-economy indicators such as urban-

¹United Nations, *Handbook of National Accounting: Integrated Environmental and Economic Accounting 2003* (New York, N.Y.: 2003).

rural land use change and annual stock estimates for timber, energy, and mineral resources. The United States, however, lags behind these and other countries.

In the United States, in 1992, the Department of Commerce's Bureau of Economic Analysis (BEA) began developing a set of environmental accounts called the Integrated Economic and Environmental Satellite Accounts. BEA created prototype accounts for the mineral resources sector and planned to continue its work by developing accounts for other sectors. However, from fiscal year 1995 through fiscal year 2002, congressional appropriations committees directed BEA not to pursue this initiative. Although this restriction has now been lifted, to date no funding has been appropriated for BEA to resume its work.

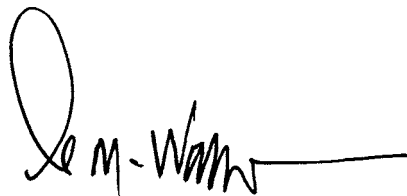
In 1999 and again in 2005, two independent National Academy of Sciences (NAS) panels, the first commissioned by the Department of Commerce and the second by the Glaser Progress Foundation, found that developing a set of comprehensive environmental accounts should be a high priority for the nation. The panels concluded that these accounts can have many benefits. Environmental accounts can provide policymakers with ecological indicators and descriptive statistics to monitor the environment's contribution to the economy and the economy's impact on the environment. In addition, environmental accounting can potentially serve as a tool for strategic planning and policy analysis to identify the implications of different regulations, taxes, and consumption patterns on environmental sustainability and paths to sustainable development of specific economic activities. For example, the United States currently lacks reliable, comprehensive information on fish stocks and the extent to which certain fish stocks are being depleted. More comprehensive data could help federal fishery managers better identify appropriate harvest limits and provide policymakers with better information to use in negotiating international fishing treaties.

BEA officials recently indicated that they will participate in any cross-cutting Administration initiative to develop environmental accounts as long as Congress supports the effort and the initiative is led by the agencies that gather and analyze the data. Initial steps toward developing environmental accounts include raising awareness of the importance of such accounts, obtaining support for such accounts, and prioritizing developmental efforts by identifying features and characteristics needed to make the accounts as useful as possible. Developing environmental accounts will require a long-term commitment. Despite some challenges, the effort could produce substantial public benefits for the nation.

Building on a prior collaborative effort on key national indicator systems,² GAO and NAS jointly convened a forum on June 19, 2007, to discuss (1) criteria to help in developing environmental accounts in the United States, (2) lessons learned from the international community, and (3) strategies for overcoming challenges to developing environmental accounts in the United States. (See app. I for the agenda.) In addition, participants spoke generally about some of the benefits of environmental accounting and potential next steps to developing environmental accounts in the United States. The forum brought together a diverse array of experts, including representatives from government, the international community, nonprofit organizations, industry, and academia. (See app. II for a list of participants.) This forum was designed so participants could comment on these issues openly, without individual attribution, in order to facilitate a rich, frank, and substantive discussion.

This report summarizes the ideas and themes that emerged at the forum, the collective discussion of participants, and comments received from participants based on a draft of this report. The highlights summarized in this report do not necessarily represent the views of any individual participant or the organizations that these participants represent, including GAO and NAS.

We want to thank all the forum participants for taking the time to share their knowledge, insights, and perspectives. We will benefit from these insights as we carry out our work, and we look forward to working with the forum's participants on this and other issues of mutual interest and concern in the future.

A handwritten signature in black ink, appearing to read "D. M. Walker", with a long horizontal line extending to the right.

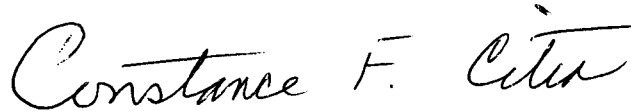
David M. Walker
Comptroller General
of the United States

²GAO, *Forum on Key National Indicators: Assessing the Nation's Position and Progress*, [GAO-03-672SP](#) (Washington, D.C.: May 1, 2003).

Introduction from the National Academy of Sciences

The National Academy of Sciences appreciated the opportunity to jointly convene the GAO/NAS Forum on Measuring Our Nation's Natural Wealth and Environmental Sustainability. The NAS recognizes the importance of the topic, and, indeed, issues in environmental accounting have been the subject of major reports by panels convened under NAS's Committee on National Statistics (see the 1999 report *Nature's Numbers—Expanding the National Economic Accounts to Include the Environment* and the 2005 report *Beyond the Market—Designing Nonmarket Accounts for the United States*).

I and the other NAS staff who worked with GAO staff to convene the forum valued the collegial relationship that characterized every aspect of the project. The discussions at the forum were illuminating of issues and concerns that merit attention in the development of environmental accounts. The NAS is pleased to have contributed to this effort.



Constance F. Citro
Director, Committee on National Statistics
National Academy of Sciences

October 24, 2007

Criteria to Help in Developing Environmental Accounts in the United States

Participants suggested several criteria for the United States to use in determining what components of environmental accounting to develop. In addition, participants identified which components are most critical to develop first. To ensure a common framework from which to discuss environmental accounting, we provided participants with background information on the four components of environmental accounting prior to the forum (see app. III).

Criteria for Focusing U.S. Efforts to Develop Environmental Accounts

Participants suggested four broad criteria to use in focusing U.S. efforts to develop environmental accounts. These criteria included relevance to the main policy objective, availability and quality of data, ability to provide information on both current and future natural wealth, and timeliness.

Relevance to the Objective

Participants generally agreed that the first step in identifying what components of environmental accounting to develop is determining the overall policy objective for the accounts. Participants made the following suggestions in this regard:

- Identify all possible objectives and then prioritize the objectives to determine what components of environmental accounting to develop.
- Determine which policy questions are most pressing and design accounts to answer those questions. History has shown that progress is made more easily when problems are more urgent in nature. Some participants cited climate change as a pressing concern, and suggested environmental accounts as a way to help inform decision making as climate change policies are developed.
- Focus on areas where environmental accounts will provide new information to enhance policy decision making. The most useful accounts will provide data that policymakers need but would otherwise lack to inform their actions.
- Do not dedicate funds to developing environmental accounts until a clear objective is established. To emphasize this point, one participant explained that because Norway and Sweden did not sufficiently develop their accounts to inform policy, the accounts have ultimately been underutilized. Additionally, one participant explained that, at times, agencies start initiatives by doing whatever is easiest instead of identifying and beginning work on the most critical or beneficial areas. This participant warned to resist such a tendency when developing environmental accounts.

Data Availability and Quality

Participants generally agreed that data availability, gaps, and quality need to be considered when determining what components of environmental accounting to develop. Participants made the following suggestions in this regard:

- Identify sources of available, reliable, and consistent data. Data used in environmental accounts must be of good quality.
- Ensure, to the extent possible, that the data collected at the national level are useful at the regional and state levels so that local managers can also use the information for decision making.
- Pursue data consistency for comparability purposes across jurisdictional boundaries, both within the United States and internationally. Consistent measures will allow analysts to value resources and assess sustainability throughout political and environmental systems and at varying levels within those systems.

Ability to Provide Information on Current Natural Wealth

Participants generally agreed that environmental accounts developed by the United States should provide information on the nation's current natural wealth. In addition, this data could be collected in such a way to allow analysts to make projections of future natural wealth. These projections would enable policymakers to better understand the implications of current consumption on future natural wealth. Participants made the following comments in this regard:

- Our nation has an obligation not to unfairly disadvantage future generations by overconsumption of resources today. Environmental accounting can provide data needed to ensure sustainable patterns of natural resource use.
- To determine natural wealth, it is important to include monetary values for the natural resources and environmental assets that are included in our nation's environmental accounts. Some participants noted that, while it is difficult, appropriate and accepted methodologies need to be developed to value our natural resources and environmental assets.

Timeliness

Some participants noted that accounts produced on a regular basis are generally more useful than irregularly or occasionally published accounts. Several participants explained that identifying an appropriate time period for updating accounts is important for obtaining trend data. The trend data derived from accounts over time can be used to predict the status of the nation's natural resources and environmental assets, understand how

changes in the quality and quantity of these resources and assets will affect the economy, and evaluate trade-offs of policy options.

Most Critical Components of Environmental Accounting for the United States

Participants generally agreed that pollution and material flow accounts, which provide information at the industry level about the generation of pollutants and solid waste and the use of energy and materials, are the most critical accounts for the United States to develop first. In addition to pollution and material flow accounts, participants identified natural resource asset accounts and environmental protection and resource management expenditure accounts as high priorities for the nation. Some participants noted that the United States does not have nationwide inventories of natural resources. One participant cited the lack of data on mineral reserves as a prominent example.

As a long-term goal, one participant noted that, in 1999, NAS recommended a comprehensive set of environmental accounts for the nation.³ Participants generally agreed that building a comprehensive set of accounts will be technically challenging and will take place incrementally over a long period of time. One participant likened the building of a comprehensive set of environmental accounts to the slow and gradual development of the national income and product accounts that took place during the 1920s and 1930s.

Perspectives and Lessons Learned from the International Community

Participants from the international community described their perspectives on environmental accounting and some key lessons learned from other countries' experiences. We provided participants with general information about select foreign countries' experiences prior to the forum (see app. IV).

International Perspectives on Environmental Accounting

Common themes expressed by participants from the international community included the need to standardize environmental accounting concepts and practices internationally, the potential for environmental accounting to inform sustainable development, and the noticeable absence of the United States in the international advancement of environmental accounting. Some participants also expressed concern about using

³National Academy of Sciences, *Nature's Numbers: Expanding the National Economic Accounts to Include the Environment* (Washington, D.C.: 1999).

International Efforts to Standardize Environmental Accounting Concepts and Practices

environmental accounts to produce official measures of gross domestic product (GDP) adjusted to account for environmental goods and services—also known as “green” GDP—because this approach faces significant methodological challenges.

Several participants described efforts by the United Nations, Eurostat, and other international organizations to standardize environmental accounting concepts and practices, such as water accounting practices. According to these participants, standardizing environmental accounting concepts and practices can yield important benefits. For example, standardization would allow for comparability across different nations’ environmental accounting data, such as for energy and water. According to one participant, standardization and comparability of environmental accounting data would enhance efforts to mitigate climate change, as well as other leading environmental and natural resources challenges facing the international community.

One participant sketched the development of environmental accounting at the UN, focusing on the following two salient events: (1) joint publication of the *Handbook of National Accounting: Integrated Environmental and Economic Accounting 2003* (SEEA 2003) and (2) formation of the United Nations Committee of Experts on Environmental-Economic Accounting (UNCEEA). According to this participant, a major objective of the UN and UNCEEA is to further elaborate and refine the SEEA 2003 and elevate it to an internationally recognized formal accounting standard, with standardized and formalized reporting requirements. Another participant questioned this publication’s suitability as a universal standard for environmental accounting. According to this participant, SEEA 2003 has too much of a “green tilt,” is not sufficiently grounded in rigorous economic principles, and has not generated professional consensus. Another participant pointed out that SEEA 2003 is a starting point for developing consensus among all stakeholders and suggested that achieving consensus on the concepts and practices will require more time.

Another participant explained that 36 countries have already standardized their water accounting practices per SEEA 2003, and approximately 36 additional countries are currently in the process of standardizing theirs. According to this participant, the international environmental accounting community could continue to gradually standardize concepts and practices for natural resource categories, eventually constructing a comprehensive environmental accounting system. One participant also noted that, for countries to adopt meaningful environmental accounting practices, there needs to be a credible, unified voice that articulates

Environmental Accounting as a Tool for Informing Sustainable Development

standard concepts and practices. Another participant cited an example of varying definitions of what constitutes a natural resource “stock” and noted that a commonly agreed upon definition would increase consistency among countries.

Several participants stated that environmental accounting could serve as a tool for informing policies attempting to foster sustainable development in both developed and developing countries. One participant noted that the European Union’s explicit environmental policy goal is sustainable development—characterized by the participant as development that breaks the link between economic growth and environmental degradation. Under the goal of sustainable development, environmental accounting is a useful analytical tool for gathering and organizing relevant data, the participant explained.

Another participant observed that development agencies often lack a common metric and even a common language for describing the environmental ramifications of development projects. To ameliorate this situation, the participant suggested that environmental accounting—because it ascribes values to environmental goods and services, tracks those values across time, and provides information on the relative costs and benefits of economic development and environmental trade-offs—could serve as a valuable common language for communicating about environmental issues with constituents in developing countries.

U.S. Absence in International Environmental Accounting Efforts

Several participants indicated that, although the United States discontinued its environmental accounting work in the mid-1990s, many other countries and major international organizations have continued to develop environmental accounting. Several participants noted the conspicuous absence of the United States from international efforts to develop a standardized framework for environmental accounting. Participants pointed out that, given its global economic significance, U.S. involvement is essential for further elaboration and eventual standardization of environmental accounting concepts and practices. One participant noted that the lack of a role by the United States in developing internationally comparable databases of common environmental information is glaring because the country produces and consumes natural resources and generates pollution in proportionally large quantities compared with other countries.

Another participant acknowledged that while there is no consensus on the concepts and practices used by countries to develop environmental accounts, those countries are nonetheless actively collaborating in

developing accounts through international organizations like the UN, Eurostat, and OECD. Continued U.S. absence in international environmental accounting efforts only delays this process and hinders international efforts to develop more informed environmental and natural resource policies.

Cautioning Against Adjusting GDP to Account for Environmental Goods and Services

Some participants warned against developing a “green” GDP that would incorporate the costs to and contributions of the environment within traditional national economic accounts. One participant characterized developing a green GDP as a risky endeavor because of significant methodological uncertainties. This participant described a foreign government’s 2-year effort to calculate such a measure and noted that, in the end, the national statistical agency determined that it was not able to produce such a measure. One participant asserted that some types of environmentally adjusted macroeconomic aggregates are biased toward including environmental costs and ignoring some environmental benefits, and for this reason should not be pursued by countries developing environmental accounts. Instead of such a measure, some participants advised an environmental accounting approach focused on natural wealth.

One participant defended the practice of calculating a green GDP. According to this participant, developing a green GDP is a worthwhile endeavor for countries to undertake in order to better understand, at an aggregate level and in proportion to economic activity, the influence of economic decisions on the environment and vice versa.

Key Lessons Learned from Other Countries

Participants shared the following lessons learned from other countries’ experiences in developing environmental accounts:

- *Provide data in a timely manner.* Two participants stressed the importance of providing environmental accounting information to policymakers in a timely manner. They illustrated this point with examples of information derived from environmental accounts that reached decision makers and policy analysts too late to be of any influence. To prevent such situations, one participant recommended that certain aspects of environmental accounts—depending upon a country’s most pressing environmental-economic concerns—be made available to decision makers on a quarterly basis. The participant explained that quarterly reporting would ensure that relevant information about interactions between the economy and the environment reach decision makers within a reasonable time frame for action.

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- *Political interest can wax and wane.* Another participant pointed out that interest in environmental accounting among a country's political leadership waxes and wanes according to shifting political agendas. In light of the varying receptivity to environmental accounting information, the participant warned that practitioners should be cognizant of differing attitudes toward information derived from environmental accounts.
 - *Environmental accounting is a long-term investment.* One participant noted that developing environmental accounts is a long-term, gradual process. It must be acceptable to gradually develop a system of environmental accounts, rather than implementing a comprehensive environmental accounting system all at once. The participant also noted, however, that while the ultimate benefits of environmental accounting can only be realized in the long-term, short-term benefits can also be achieved, including improved data collection across a range of government statistics and more rigorous, contextually sophisticated environmental indicators.

Key Challenges and Strategies for Developing Environmental Accounts

Participants discussed several key challenges to developing environmental accounts in the United States. Participants also suggested numerous strategies, a number of which were applicable to several of the challenges. To ensure a common framework from which to discuss the key challenges, we provided participants with a list of challenges prior to the forum (see app. V). These challenges included institutional differences based on agencies' varying missions, a need for support from policymakers and others, a need for financial resources, methodological uncertainty, and data availability, compatibility, and reliability.

Key Challenges to Developing Environmental Accounts

Participants broadly agreed that the greatest challenge to developing environmental accounts in the United States is the need to generate support from policymakers and others. Some participants expressed concern that Congress might halt any new efforts to develop accounts, as happened with BEA's previous effort in the 1990s when congressional members from coal-producing states raised methodological and other concerns. Therefore, participants emphasized the need for building and sustaining support among policymakers and the public to develop environmental accounts.

After the need for political support, participants generally agreed that institutional differences were the next greatest challenge to developing environmental accounts in the United States. Some participants explained that differences in agencies' individual missions can hinder collaborative

efforts because data are collected specifically to meet the agencies' needs, and there is resistance to change the way the data has been collected over time. In addition, agencies are under pressure to reduce costs and produce only the most pertinent high-priority information that programs require. One participant pointed out that the National Academy of Public Administration is currently working on identifying ways to improve institutional capabilities and is developing a set of options for improving coordination of data collection. The results of this effort might help inform appropriate institutional arrangements for developing environmental accounts.

Participants found the other key challenges—the need for funding; data availability, compatibility, and reliability; and methodological uncertainty—to be considerable and noted that they must be confronted in any attempt to develop environmental accounts. Some participants emphasized the need for appropriate and accepted methodologies for valuing our natural resources and environmental assets. One participant explained, for example, that some natural resource goods and services, such as clean air and water, are not traded in the market and are, therefore, methodologically difficult to value. Estimating nonmarket value is inherently uncertain, raising concerns that including such estimates in environmental accounts would diminish the usefulness of existing GDP measures.

Participants generally agreed that, while it is important for the United States to develop environmental accounts, the key challenges make it a difficult endeavor. Participants also generally agreed that if developing environmental accounts was simple, the United States would most likely already have done so, noting that a general consensus on the need for environmental accounts dates back to the 1930s. At the same time, one participant stated that success in developing environmental accounts is inevitable, although it will be measured in decades rather than years.

Strategies for Developing Environmental Accounts

Participants generally agreed that it is possible for the U.S. to overcome its key challenges to environmental accounting. Participants provided the following strategies, some of which cut across several of the identified challenges, to policymakers and other individuals who seek to develop environmental accounts:

- Understand other countries' experiences with developing environmental accounts in more depth. Participants broadly agreed that a GAO report that details other countries' experiences with establishing environmental

accounts would be useful for informing a U.S. effort to develop accounts.

- Develop an economic case for environmental accounting. Participants generally agreed that the economic case for environmental accounting needs to be intergenerational because environmental accounting is about ensuring that our children and grandchildren experience a comparable standard of living. One participant explained that the United States is a wealthy nation in part because it has a healthy environment. The participant suggested that it would be helpful for advocates of environmental accounting to develop narratives that explain how the health of the environment is changing and reveal the potential economic and social consequences that can result from those changes. Participants generally advised against using the concept of sustainability to justify developing environmental accounts because the term is sometimes viewed negatively. Instead, participants suggested possible alternatives, such as using natural capital and natural resource stewardship as the principal rationale behind developing environmental accounts.
- Focus on accountability and performance. One participant suggested that when making the case for environmental accounting, advocates should move from discussing “accounting” to emphasizing “accountability and performance.” This participant noted that such a change in language would help focus attention on the federal government’s poor job of assessing the performance of environmental programs and help inform the public that while the United States has well-established environmental laws, it does not have effective ways of measuring their performance. Another participant disagreed with the notion that the government does not measure the performance of environmental programs. The participant speculated that most programs have metrics for measuring performance, while also acknowledging that those metrics may not be the best quality.
- Identify policymakers, technical experts, and others who support the effort. Participants noted that continued support is critical for initiating and sustaining efforts to develop environmental accounts.
- Identify and solicit the help of environmental experts. Specialists in environmental accounting and related technical fields can be instrumental in assisting these efforts.
- Use an incremental approach. Participants generally agreed that an incremental approach must be used because the combination of challenges—questions about how the data will be used, broad apathy from policymakers and others, and technical difficulties—can appear insurmountable and thereby derail the effort. Interim measures must be

developed if the United States is to successfully implement national environmental accounting.

- Take the time necessary to develop quality accounts. One participant compared the effort to develop environmental accounts with the effort to create national economic accounts that started in the 1920s. The effort to establish our national economic accounts took decades to complete, while the data improved over time. Participants generally agreed that creating environmental accounts should be taken seriously but slowly.

General Observations and Next Steps

Participants provided general observations on the overall value of environmental accounting to the United States and sustaining an effort to develop environmental accounts. Participants broadly agreed that the United States should develop environmental accounts and that environmental accounting can serve as a valuable tool to better account for the nation's natural resources and environmental assets. In addition, participants generally agreed that developing environmental accounts is important for both U.S. environmental and economic sustainability.

Some participants discussed comparisons between environmental accounting and environmental indicators, noting that, unlike indicators, environmental accounts can help evaluate trade-offs between policy options, and thereby help inform policymakers' decisions. They noted that data in environmental accounts can also be used to develop environmental indicators. Some participants noted that indicators that are based in environmental accounts are higher quality indicators.

Several participants offered to be partners in an effort to develop environmental accounts in the United States but also noted that they would need support and a designated lead agency to spearhead the effort. Participants disagreed about which agency should lead a national effort to develop environmental accounts but agreed that it will need to be directed and supported by the Administration and Congress. Some participants believed that BEA should lead the effort to develop environmental accounts. Other participants thought that the three agencies that spend the greatest amount of funding to collect environmental data—specifically the Departments of Agriculture and the Interior, and the Environmental Protection Agency—should play leading roles in the effort. In this regard, one participant noted the NAS recommendation for cross-agency collaboration with a policy agency leading the effort. Other participants thought that a separate entity to collect and analyze data, establish environmental accounts, and disseminate environmental information

would be a better vehicle than interagency cooperation within the current federal structure. One participant observed that much work can be done in the interim, before getting everyone's cooperation.

Finally, participants suggested continuing the discussion on environmental accounting to build momentum for the effort. Several participants observed that this forum was a good venue in which to further the discussion on environmental accounting and noted the importance of continuing the dialogue among key experts.

Appendix I: Agenda

8:00 a.m.	Check-in
8:30 a.m.	Opening session Welcome and introductions Setting the stage—presentation by the Comptroller General
9:00 a.m.	Session I: What components of national environmental accounts should the United States develop and why? Presentation on history of environmental accounting in the United States and components of national environmental accounts <i>Presenter: Steve Landefeld, Bureau of Economic Analysis</i>
9:15 a.m.	Group discussion <ul style="list-style-type: none">• What criteria should be used to determine which components of environmental accounts should be developed?• What specific components of environmental accounts should the United States develop in the short and long term?
10:15 a.m.	Coffee break
10:30 a.m.	Session II: What are the lessons learned from other countries' experiences in developing environmental accounts? Presentation on other countries' experiences <i>Presenter: Glenn-Marie Lange, Columbia University</i>
10:45 a.m.	International perspective from select participants <i>Featured speakers:</i> Ivo Havinga—U.N. Statistical Division Brennan Van Dyke—U.N. Environment Programme Enrico Giovannini—Organisation for Economic Co-operation and Development Pieter Everaers—Eurostat Walter Radermacher—German Federal Statistical Office Rob Smith—Statistics Canada
11:15 a.m.	Group discussion
11:45 a.m.	Lunch is distributed

-
- 12:00 p.m.** **Session III:** How should the United States address key challenges in developing environmental accounts?
- Presentation on key challenges
 Presenter: Ted Heintz, White House Council on Environmental Quality
- 12:15 p.m.** **Group discussion**
- 1:15 p.m.** **Wrap-up**
- 2:00 p.m.** **Adjournment**

Appendix II: List of Participants

Moderators

David M. Walker	Comptroller General of the United States U.S. Government Accountability Office
Glenn-Marie Lange	Senior Research Scholar, The Center for Economy, Environment, and Society Columbia University

Participants

James Boyd	Senior Fellow and Director, Energy and Natural Resources Resources for the Future
Pieter Everaers	Director, Agriculture and Environment Statistics and International Cooperation Eurostat
Ronald S. Fecso	Chief Statistician U.S. Government Accountability Office
John Felmy	Chief Economist American Petroleum Institute
Enrico Giovannini	Director of Statistics and Chief Statistician Organisation for Economic Co-operation and Development
Howard Gruenspecht	Deputy Administrator Energy Information Administration
Ivo C. Havinga	Chief of Branch, Economic Statistics Branch United Nations Statistics Division
H. Theodore Heintz, Jr.	Indicator Coordinator White House Council on Environmental Quality
Christopher Hoenig	Chair, Executive Committee Key National Indicators Initiative
Christopher B. Kearney	Deputy Assistant Secretary for Policy and International Affairs U.S. Department of the Interior

Steve Landefeld	Director U.S. Bureau of Economic Analysis
William J. Mates	Economist/Research Scientist New Jersey Department of Environmental Protection
Gary W. Mast	Deputy Undersecretary for Natural Resources and the Environment U.S. Department of Agriculture
Steven Murawski	Director of Scientific Programs National Oceanic and Atmospheric Administration
Susan E. Offutt	Chief Economist U.S. Government Accountability Office
Marcus C. Peacock	Deputy Administrator U.S. Environmental Protection Agency
Walter Radermacher	President German Federal Statistical Office
Carol Raulston	Senior Vice President, Communications National Mining Association
Robert Repetto	Professor Yale School of Forestry and Environmental Studies
Robert A. Robinson	Managing Director, Natural Resources and Environment U.S. Government Accountability Office
Robert Smith	Division Director, Environment Accounts and Statistics Statistics Canada
Brennan Van Dyke	Director, Regional Office for North America United Nations Environment Programme

Appendix III: Background on Components of Environmental Accounting

To ensure a common framework from which to discuss environmental accounting, we provided participants with information on the four components of environmental accounting prior to the forum. We identified these components through literature reviews and discussions with a range of subject matter experts. The information provided to forum participants is reproduced below.

Background

As described below, there are four primary components of environmental accounts. These accounts provide data for varying purposes and include physical information on resources and pollution, as well as monetary values.

1. **Natural resource asset accounts** primarily deal with stocks of natural resources. These accounts provide indicators that help monitor the sustainability of a resource.
 - a. *Physical asset accounts* help monitor ecological sustainability by tracking the physical amount of a resource.
 - b. *Monetary asset accounts* establish a monetary value for the total national wealth of a resource.

Examples of natural resource accounts include land accounts that track the conversion of agricultural land to urban settlements and the value of native forests.

2. **Pollution and material flow accounts** provide information at the industry level about the use of energy and materials and the generation of pollutants and solid waste. These accounts provide indicators of sustainability, information on the sources of environmental pressure, and options for change.
 - a. *Physical flow accounts* help set priorities for policy based on the volume of material use and pollution.
 - b. *Monetary flow accounts* identify relative costs and benefits of reducing pollution.

Examples of pollution and material flow accounts include time series accounts for pollution emissions and energy use and an index of water use, gross domestic product growth, and population growth.

3. **Environmental protection and resource management expenditure accounts** identify expenditures made by industry, government, and households to protect the environment or manage resources. These accounts help address questions about regulation, i.e., the cost of environmental regulation over time; the effectiveness of environmental protection expenditures and eco-taxes; and the impact of such expenditures on prices, productivity, and international competitiveness. Examples of environmental protection and resource management expenditure accounts include fees collected by government for resource use, such as levies on minerals, forestry, or fisheries, and funds spent on water treatment and solid waste management.
4. **Environmentally adjusted macroeconomic aggregates** include indicators of sustainability such as an environmentally adjusted net domestic product. These aggregates can be physical or monetary and help assess overall environmental health and economic progress. Examples of environmentally adjusted macroeconomic aggregates include theme indicators for greenhouse gas emissions, acidification, and solid waste and environmentally adjusted product and income accounts.

Appendix IV: Background on Selected Other Countries' Experiences

Prior to the forum, we provided participants with information about select foreign countries' experiences. We identified key research and programs through literature reviews and discussions with international experts and country representatives. The information provided to forum participants is reproduced below.

Background

Up until the mid-1990s, the United States was on par with other industrialized nations in developing environmental accounts. However, since Congress prohibited BEA's work in this area in fiscal year 1995, many nations' statistical offices and ministries of environment have developed and implemented sophisticated natural resource and environmental accounts. In doing so, they have experienced important lessons that could benefit the U.S. federal government's implementation of environmental accounting. Three such countries are Canada, Australia, and the Netherlands.

Canada

Since the early 1990s, Statistics Canada has annually produced asset, material and energy flow, and environmental protection expenditure accounts, which together comprise the Canadian System of Environmental & Resource Accounts. A set of 10 environment-economy indicators has twice been published based on these accounts. As Canada is perhaps closest to the United States in size, resource composition, and environmental policies, it could serve as a useful study in how the United States might develop a comprehensive system of environmental accounts.

Australia

Much of Australia is arid, and there is extreme year-to-year variation in the amount of rainfall. To better understand how to make the most of Australia's limited water resources, the Australian Bureau of Statistics and the National Water Commission have tracked and documented the supply and use of water in the Australian economy since 2000. So far, three water accounts have been produced. Australia's experience with water accounting could be particularly relevant for regional water management in the arid U.S. Southwest and other areas with competing water needs. In addition to water accounts, Australia produces annual environmental accounts for subsoil, timber, and land assets. Australia also produces occasional accounts for energy flows, greenhouse gas emissions, fish assets, waste flows, and environmental protection expenditures.

Netherlands

Although the Netherlands is a geographically small, homogenous, and natural resource-poor country, Statistics Netherlands compiles rigorous accounts on pollution and material flows. Indeed, statisticians from the Netherlands developed a widely influential material flows accounting

system—the NAMEA, National Accounting Matrix including Environmental Accounts. NAMEA functions as an instrument for a variety of analyses, including the identification of the economic and environmental effects of consumption of certain products. In addition, Statistics Netherlands and the Netherlands Environmental Assessment Agency have developed an Environmental Data Compendium, based in large measure upon these accounts. The Netherlands' overall experience with the NAMEA approach may be useful to any country contemplating environmental accounting.

Appendix V: Background on Key Challenges

To ensure a common framework from which to discuss the key challenges, we provided participants with a list of challenges prior to the forum. We identified these challenges through literature reviews and discussions with experts. The information provided to forum participants is reproduced below.

Background

The Bureau of Economic Analysis's (BEA) effort to develop environmental accounts in the early 1990s—as well as other multilateral and multistakeholder efforts such as environmental indicators—provides policymakers with insight into challenges that the United States will face in developing national environmental accounts. To be successful, the U.S. approach will need to strategically address the following five challenges:

1. **Institutional differences**—*What agencies should be involved in developing and producing these accounts and how should their work be coordinated? What new institutional capabilities or arrangements are needed?*

BEA was the lead agency in past efforts, but developing environmental accounts will draw upon expertise, resources, and data held by a diverse range of federal agencies. For example, to develop a national forest account, the BEA would need to aggregate data from the Forest Service, Park Service, Bureau of Land Management, state forestry agencies, and others.

2. **Need for support**—*Will agencies have the broad support needed to devote time and resources to designing environmental accounts?*

The federal government's previous effort to develop environmental accounts was halted by Congress. Renewed efforts need the support of the administration, Congress, and the public.

3. **Need for resources**—*How will the United States fund the development of environmental accounts?*

A new institutional arrangement designed to allow disparate agencies to collaboratively develop environmental accounts would require additional funding. Securing such funding in the present era of tightly constrained budgets could pose a significant challenge.

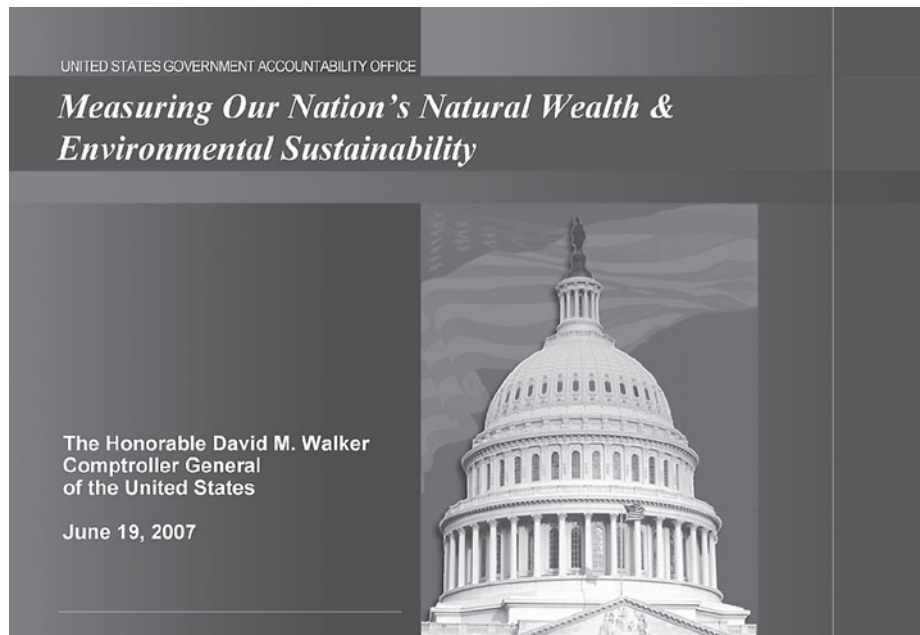
4. **Methodological uncertainty**—*How should the United States address uncertainties, for example in measuring and valuing our natural resources and environmental assets?*

In the past, resistance to environmental accounting has stemmed from questions about the methodological soundness for measuring stocks and flows of natural resources and quantities of environmental services and procedures for valuing nonmarket goods and services. Developing national environmental accounts requires consensus on methodological approach and implementation techniques.

5. **Data availability, compatibility, and reliability**—*What actions are needed to ensure that the essential data are produced?*

Sufficient, compatible, and reliable data must be available to develop and populate environmental accounts. While many entities collect relevant data, it may or may not be available, compatible, and/or reliable.

Appendix VI: Presentation Given by the Comptroller General of the United States

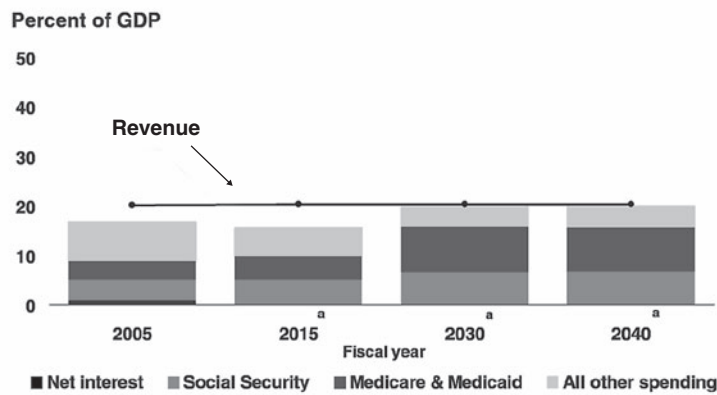


Sustainability: Are We On Track?

- Are we sustaining our natural resources and safeguarding our environmental assets for future generations while also promoting economic growth and maintaining our quality of life?
- Assessing sustainability requires reliable and accurate national data
 - For example, we have reliable budget projection data, so we can predict a large and growing fiscal imbalance
 - The data show that we are not on a sustainable path

Source: GAO.

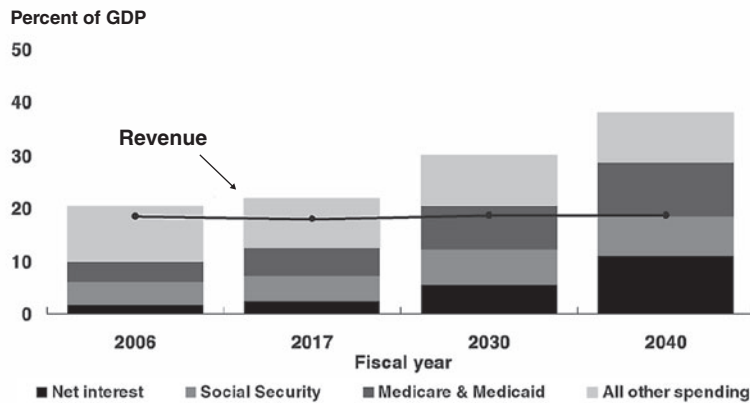
Potential Fiscal Outcomes Under Baseline Extended (January 2001) Revenues and Composition of Spending as a Share of GDP



Source: GAO's January 2001 analysis.
Notes: In addition to the expiration of tax cuts, revenue as a share of GDP increases through 2017 due to (1) real bracket creep, (2) more taxpayers becoming subject to the AMT, and (3) increased revenue from tax-deferred retirement accounts. After 2017, revenue as a share of GDP is held constant—implicitly assuming action to offset the impact of bracket creep and to modify or offset the AMT.
^aAll other spending is net of offsetting interest receipts.

Potential Fiscal Outcomes

Discretionary Spending Grows with GDP After 2007 and
All Expiring Tax Provisions Extended through 2017
(Thereafter Revenue Returns to Historical Average
of 18.3% of GDP plus Deferred Revenue)

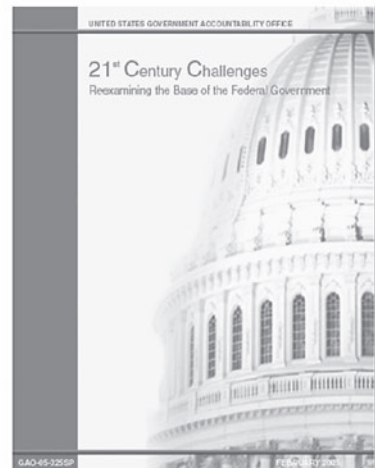


Source: GAO's January 2007 analysis.

Source: GAO.

21st Century Challenges Report

- These potential fiscal outcomes are inextricably linked to 21st Century Challenges
- GAO has developed a report that is intended to guide Congress in overcoming these challenges
- Provides background, framework, and questions to assist in reexamining the base of federal government
- One of twelve reexamination areas is Natural Resources, Energy, and the Environment



Source: GAO.

Managing Natural Resources, Energy, and the Environment as a 21st Century Challenge

- As the nation moves into the 21st century, it is becoming increasingly apparent that the current approach to natural resources use and environmental protection may need changes to address the long-term stresses affecting so many of our nation's natural ecosystems.
- "... the broad, long-term challenge is determining how the nation can reconcile the desire for consumption today with the need to protect resources to sustain the future."

Source: GAO.

Source: GAO.

National Natural Resource and Environmental Information

- Many federal agencies collect natural resource and environmental data, but no agency coordinates and aggregates this data
- As a result, we do not know whether we are using our natural resources and environmental assets in a sustainable manner
- Moreover, current environmental protection efforts, alone, cost businesses and taxpayers over \$100 billion a year. However, we don't know whether these efforts are targeted with maximum effect.

Environmental Accounting as a Policy Tool

- According to the National Academy of Sciences, environmental and natural resource accounts would provide useful data on resource trends and help governments, businesses, and individuals better plan their economic activities and investments.
- Environmental accounting provides a framework for the information we need to assess sustainability.

Source: GAO.

Key Issues to Consider in Developing Environmental Accounts in the U.S.

- What short & long-term goals should the U.S. have for developing environmental accounts?
- What are the chief obstacles impeding progress on environmental accounting in the U.S. and how should they be overcome?
- What key insights can we apply from our partners in the international community?
- What should be the first steps taken by the U.S. federal government to initiate environmental accounting?

Source: GAO.

Appendix VII: Contacts and Acknowledgments

Contacts

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Acknowledgments

In addition to the contacts above, James Cosgrove, Acting Director; José Alfredo Gómez, Assistant Director; Richard Bakewell; John Delicath; and Barbara Patterson, all of GAO; and Jane Ross, Director, and Christopher Mackie, Study Director, both of NAS; managed all aspects of the work.

Related Products

Related NAS Products

Beyond the Market: Designing Nonmarket Accounts for the United States. Washington, D.C.: National Research Council, 2005.

Nature's Numbers: Expanding the National Economic Accounts to Include the Environment. Washington, D.C.: National Research Council, 1999.

Related GAO Products

Environmental Information: Status of Federal Data Programs That Support Ecological Indicators. [GAO-05-376](#). Washington, D.C.: September 2, 2005.

Environmental Indicators: Better Coordination Is Needed to Develop Environmental Indicator Sets That Inform Decisions. [GAO-05-52](#). Washington, D.C.: November 17, 2004.

Watershed Management: Better Coordination of Data Collection Efforts Needed to Support Key Decisions. [GAO-04-382](#). Washington, D.C.: June 7, 2004.

Geographic Information Systems: Challenges to Effective Data Sharing. [GAO-03-874T](#). Washington, D.C.: June 10, 2003.

Forum on Key National Indicators: Assessing the Nation's Position and Progress. [GAO-03-672SP](#). Washington, D.C.: May 1, 2003.

Great Lakes: An Overall Strategy and Indicators for Measuring Progress Are Needed to Better Achieve Restoration Goals. [GAO-03-515](#). Washington, D.C.: April 30, 2003.

Major Management Challenges and Program Risks: Environmental Protection Agency. [GAO-03-112](#). Washington, D.C.: January 1, 2003.

Results-Oriented Management: Agency Crosscutting Actions and Plans in Border Control, Flood Mitigation and Insurance, Wetlands, and Wildland Fire Management. [GAO-03-321](#). Washington, D.C.: December 20, 2002.

Environmental Protection: Observations on Elevating the Environmental Protection Agency to Cabinet Status. [GAO-02-552T](#). Washington, D.C.: March 21, 2002.

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