



Strategic Objective:

Responsible Stewardship of Natural Resources and the Environment

Issue: The nation's natural resources and the systems associated with their use are under unprecedented stress, generating intense debate and posing daunting challenges to policymakers at all levels of government. In part, this is the consequence of the country's growing population and economy, but other stress factors exist as well, such as the globalization of the world's economy and political tensions. Most glaringly, the tragic events of September 11 revealed the nation's vulnerability to hostile acts, mandating heightened protection of its critical natural resources, including the air we breathe, the water we drink, the food we consume, and the energy supplies that keep the economy going.

Even before the tragic events of September 11, however, part of the country faced an energy crisis. The chaos in California's electricity market underscored the difficulties of crafting energy policies and regulatory approaches that adequately protect against price volatility and supply disruptions. Without the application of prudence and foresight in crafting the nation's strategic energy plan, similar crises could affect other areas of the country in the electricity, natural gas, heating oil, and gasoline markets. The challenge is further complicated by the global nature of many energy markets, and growing doubts about the long-term sustainability of policies that demand increased production from the existing energy mix. Furthermore, strategies must now incorporate greater attention to the means of protecting a massive energy infrastructure that encompasses 5,000 power plants, 204,000 miles of high voltage transmission lines, and nearly 3 million miles of oil and gas pipelines. Finally, energy strategies must consider the environmental consequences of energy choices, as illustrated by issues surrounding the potential reemergence of the nuclear power industry. While increased nuclear power capacity would provide needed electricity, vexing questions would remain about where and how to store the byproduct radioactive waste in an environmentally sound manner as well as how to secure the plants and waste sites against possible future attacks.

The country's lands and waters are more than ever under increasing stress. This is evidenced by rapidly dwindling open spaces, declining biodiversity, depleted aquifers, and collapsing fisheries—the unintended consequences of economic growth and the need to sustain the lifestyle of a growing population. Reconciling and balancing the demands of often competing objectives—economic growth for today versus natural resource protection for the future—is a major challenge facing the American public and their elected leaders. The difficulties experienced in trying to reach agreement on whether, and how, the Arctic National Wildlife Refuge in Alaska should be used for oil and gas drilling is a prime example of this challenge. In this case, the issue pertains to the use of federal lands, which constitute about 30 percent of the country's total land surface, but similar controversies exist over privately held lands affected by federal law and regulations. The use of the nation's waters present equally sobering challenges, as pollutants and over fishing rapidly deplete coral reefs and offshore fisheries, while competition over rights to fresh water supplies grows among various interests, such as ranchers, communities, utilities, and recreational users. Conflicts over water are especially pronounced in arid areas of the West that have experienced a high population growth in recent years.

Food safety lies at the forefront of concerns about the country's agricultural resources, an urgent matter given the potential for agricultural bioterrorism. Besides this troubling matter, a whole range of other food safety issues, while less ominous, nevertheless pose serious questions. These include questions about the adequacy of the government's recent devolution of food inspection authority, and its new "farm-to-table" food safety approach. Foreign concerns are increasing, meanwhile, about the safety of U.S. genetically modified crops and foods, an important development given the significant role that food exports play in the health of the U.S. agricultural economy. The Congress also faces other important issues as it debates the future direction of U.S. farm policy. Questions over the role of agriculture in land conservation, wildlife habitat protection, and energy production efforts are likely to figure prominently in the deliberations.

The increasing globalization of natural resource issues also affects pollution control matters, as seen in the federal government’s discussions with other governments about global warming and what should be done about it. Such discussions add a new layer of complexity to the already difficult question of how to sustain economic growth when the engines of that growth—factories, cars and trucks, fertilizers, electricity generating plants—can adversely affect air and water quality. Another factor in attaining federal air and water quality goals is that land use practices, often resulting in “urban sprawl,” are controlled mainly by local governments and private owners. Moreover, the federal government relies upon state and local governments for inspection and enforcement actions.

Finally, significant challenges remain in cleaning up the country’s hazardous and radioactive waste sites. Today, an estimated 60 million Americans live within 4 miles of a hazardous site, and radioactive waste from weapons production still needs to be cleaned up at Department of Energy sites in 13 states. These sites’ continued existence poses not only potential health and safety problems, but fiscal and economic problems as well. Delayed cleanup results in higher price tags for eventual cleanup, and in stunted economic development in the affected

communities. Also, the terrorist attacks of September 11 underlined the need for steps to ensure the security of hazardous and radioactive materials during storage, transportation, and disposal.

Performance Goals: To support efforts by the Congress and the federal government to address these issues, GAO will

- assess the nation’s ability to ensure reliable and environmentally sound energy for current and future generations;
- assess federal strategies for managing land and water resources in sustainable fashion for multiple uses;
- assess federal programs’ ability to ensure a plentiful and safe food supply, provide economic security for farmers, and minimize agricultural environmental damage;
- assess federal pollution prevention and control strategies; and
- assess efforts to reduce the threats posed by hazardous and nuclear wastes.

Assess the Nation's Ability to Ensure Reliable and Environmentally Sound Energy for Current and Future Generations

Key Efforts

- ❑ Assess tradeoffs among alternative energy choices, principally (1) efforts to increase the supply of energy from all energy sources—fossil (oil, gas, and coal), nuclear, and renewable (wind, solar, biomass, photovoltaics, and geothermal) and (2) actions to reduce demand by using energy more efficiently; consider the effects of emerging energy technologies and research and development partnerships between the federal government and the private sector
- ❑ Examine and assess energy security plans and efforts to
 - (1) protect the nation's energy infrastructure from terrorism and other sources of disruption;
 - (2) reduce U.S. and consumer vulnerabilities to price spikes, severe weather and supply disruptions; and
 - (3) determine the impact of energy company mergers, consolidations, and federal incentives (including tax credits) on the prices of energy and consumers
- ❑ Assess whether aging pipelines and transmission lines have the capacity to meet the demand for reliable, safe energy delivery
- ❑ Review the interrelationships among energy and other natural resource issues, such as the environmental effects of burning fossil fuels, and their implications for federal energy policies and programs

Significance

The nation's energy system is under stress. In energy markets—such as natural gas, electricity, home heating oil, and gasoline—demand and supply relationships periodically change significantly, resulting in volatile prices. Most recently, the threat of terrorism and its potential to disrupt the energy system has brought a heightened sense of urgency to the task of ensuring the security and reliability of that system. Periodic declines in energy supplies and price volatility burden consumers and adversely affect economic activity. At the same time the country's energy choices affect the environment and, in some cases, threaten supplies for future generations. As such, there is growing acceptance that the United States, if it is to resolve these stresses on its energy system, cannot sustain an exclusive reliance on increased production from the existing energy mix to meet ever rising levels of consumption. To meet these challenges, the nation may need to consider a more unified and innovative energy strategy that reevaluates the current policy and identifies the available alternatives.

The preferred energy sources and the methods used to acquire them present formidable challenges in forming a national energy policy, because it is important to strike a delicate balance between energy, environmental, and economic needs. Over time, it will also be important to assess worldwide energy practices, explore new research opportunities, and consider new and alternative energy choices that are more sustainable. The nation and consumers can jointly benefit from emphasizing an energy system in which energy consumption works in tandem with environmental preservation and other societal goals. Because energy remains a vital component to the health of the U.S. economy and way of life, the decade ahead requires critical policy and investment choices to create an energy system that meets the public's changing needs. In addition, new approaches are needed to protect the nation's energy system and ensure its physical and economic stability.

Assess the Nation's Ability to Ensure Reliable and Environmentally Sound Energy for Current and Future Generations (cont.)

- ❑ Determine the implications of embracing energy competition and free markets as alternative means to restructure electricity markets and evaluate changing regulatory approaches to ensure that these restructured markets function properly
- ❑ Analyze the adequacy of the Department of Energy's (DOE), the Federal Energy Regulatory Commission's (FERC), and the Nuclear Regulatory Commission's (NRC) organization, human capital, and management processes for supporting efficient and effective operations

Potential Outcomes that Could Result when GAO's Work Is Used

Congressional consideration of the full range of realistic projections of supply options with information on the benefits and costs to alternative actions

Congressional consideration of innovative alternatives to the escalating production and consumption of greater amounts of energy

More informed congressional funding decisions resulting in effective research spending, more efficient energy use, and budgetary savings

Enhanced oversight of the nation's energy security against terrorism and other threats in areas such as the Strategic Petroleum Reserve, the country's energy grid, and other infrastructure

Greater congressional awareness of how energy market concentration affects the consumer market and of the effectiveness of federal incentives

Improved federal and private market structures to encourage necessary enhancements and modernization of U.S. energy infrastructure

A more informed debate on alternative energy paths, including a better understanding of related environmental effects

Improved congressional understanding of transitional issues in restructuring the electricity market, market design and monitoring, and lessons learned

Market structures and rules that are fair, appropriate, and not subject to abuses

Improvements in DOE's, FERC's, and NRC's organization, human capital, and management processes

Assess Federal Strategies for Managing Land and Water Resources in a Sustainable Fashion for Multiple Uses

Key Efforts

- ❑ Evaluate federal land management agencies' progress in coordinating activities, addressing resource issues, and protecting critical environmental and natural resource systems from misuse, negligence, or intentional acts
- ❑ Review federal land management agencies' efforts to develop and implement a strategy to reduce wildfires on federal lands
- ❑ Assess federal land management agencies' operational needs and their multibillion-dollar backlog of deferred maintenance at national parks, forests, and other facilities
- ❑ Analyze federal efforts to obtain a fair market value for minerals and other resources extracted from federal lands, while balancing consumption and conservation needs
- ❑ Assess federal efforts to manage the nation's rivers, oceans, and marine environments in a way that balances resource protection with consumption and conservation needs
- ❑ Evaluate the federal government's efforts to clarify its relationship with, and meet its responsibilities to, Native Americans and Alaskan Natives
- ❑ Analyze federal agencies' efforts to protect threatened and endangered species on federal and nonfederal lands and in bodies of water
- ❑ Analyze the adequacy of the land and water resource agencies' organization, human capital, and management processes for supporting the agencies' operations

Significance

Federal policies over land and water resources have for many years been the subject of sometimes bitter conflict. While most land in the United States is privately owned, the resources owned and managed by the federal government are vast—over 650 million acres of land, or 30 percent of the nation's total land surface; over 700 million acres of mineral estate that underlie both federal and other surface ownerships; about 1.75 billion acres of the Outer Continental Shelf; and fisheries extending up to 200 miles offshore. In 2000, the estimated market value of production occurring on public lands was nearly \$14 billion, and the direct and indirect economic effect of all commercial activities amounted to nearly \$30 billion. Federal laws also affect activities on some private lands by protecting wetlands or critical habitat of threatened or endangered species.

The inherent conflict over federal land use policies has been, firstly, over which of the current competing needs and uses for resources on federal lands should be addressed and, secondly, over whether to use resources today or to preserve and sustain them for future generations. Achieving a balance among these forces remains a constant struggle. Amidst this conflict, the nation's land and water resources are showing increasing signs of stress—more catastrophic wildfires, shrinking water aquifers, an accelerating rate of extinction of plants and wildlife, destruction of wildlife habitat, and the collapse of many fisheries. Moreover, the September 11 terrorist attacks heightened the need to protect critical natural resource systems not only from natural disasters or negligence, but also from acts to intentionally damage those resources or use them in assaults against the nation's security. In this context of competing demands and security considerations, policymakers will need solid information to make rational policy choices and ensure that federal taxpayers benefit from the uses made of natural resources. How the nation addresses these challenges today will profoundly affect the viability of its natural resources, and the well-being of the public, for generations to come.

Potential Outcomes that Could Result when GAO's Work Is Used

More efficient and effective land management to better protect federal lands, their resources, and the surrounding environment

Assess Federal Strategies for Managing Land and Water Resources in a Sustainable Fashion for Multiple Uses (cont.)

Enhanced congressional understanding of options for setting charges for the use of federal resources to facilitate a move toward greater self-sufficiency by the parks, forests, and other entities, and to ensure a fair return for the use of public resources

Informed decisions on how to balance production, revenue generation, and conservation of natural resources

Clearer understanding of the government-to-government relationship between the federal government and Indian tribes and of ways to improve programs promoting Indian self-determination and self-sufficiency

An improved understanding of the social, political, and financial issues associated with species protection efforts to inform the debate on reauthorizing the Endangered Species Act

Informed congressional oversight of the natural resources agencies' organization, human capital, and management processes

Assess Federal Programs' Ability to Ensure a Plentiful and Safe Food Supply, Provide Economic Security for Farmers, and Minimize Agricultural Environmental Damage

Key Efforts

- ❑ Evaluate federal programs' ability to ensure a safe and wholesome food supply across the full spectrum of food production from the farm to the table, including guarding against terrorism
- ❑ Assess the capability of the current food safety system to ensure the safety, quality, and the long-term environmental soundness of new emerging food products developed from scientific and technical advances, such as genetically modified foods and functional foods
- ❑ Evaluate the effectiveness and budgetary consequences of federal programs designed to ensure a plentiful and affordable food supply and to aid farmers in times of declining global crop prices or domestic production
- ❑ Evaluate the outcomes and costs of federal programs designed to minimize the adverse land use and environmental effects of agricultural practices
- ❑ Evaluate USDA's ability to mitigate the threats to crops and livestock from purposeful attacks and from invasive pests and diseases
- ❑ Analyze the adequacy of USDA's organization, human capital, and management processes for supporting efficient and effective operations

Significance

Federal food safety oversight and the Department of Agriculture's (USDA) farm assistance programs play a critical role in ensuring a safe, abundant, and affordable food supply. Although the U.S. food supply is generally considered safe, foodborne illnesses continue to threaten the nation's health and tax its medical system. Experts estimate that foodborne pathogens cause 76 million cases of gastrointestinal illnesses, 325,000 hospitalizations, and 5,000 deaths annually. Furthermore, illnesses from just the five principal foodborne pathogens cost about \$7 billion in medical expenses and productivity losses each year. While the federal government distributes over \$1 billion annually to its various agencies to reduce the health and economic consequences of foodborne illnesses, some regulatory agencies have begun making the transition to new science-based regulatory strategies, which place increasing responsibility on industry for identifying and controlling risks in the production processes. Although better than the existing archaic process of preventing foodborne illnesses, these science-based strategies address only a segment of the food production and distribution continuum and their implementation is inconsistent across the food supply. In addition, scientific and technical advances in the production of food, such as the development of genetically modified foods, place additional responsibilities on the federal food safety agencies. Furthermore, recent events have heightened the awareness that threats to the food supply are a component of terrorism and present new challenges to an already burdened system. Consequently, a new "farm-to-table" approach for food safety—one that starts with growers and extends to retailers—is needed to ensure that the full spectrum of food production is safeguarded.

In fiscal year 2001, USDA spent about \$26 billion on a variety of farm assistance, land conservation, and environmental programs. Some argue that support to farmers is particularly necessary now in light of lower agricultural commodity prices and declining net farm income. Others question the effect, relevance, and costs of these programs, given that most farm assistance—because of the dramatic consolidation of the farm sector—goes increasingly to large corporate entities. As the next farm bill is formulated and implemented, these and other issues—such as placing greater emphasis on land conservation, exploring energy production-related uses of agricultural land, and reducing agriculture's impact on water quality—will need to be evaluated.

Assess Federal Programs' Ability to Ensure a Plentiful and Safe Food Supply, Provide Economic Security for Farmers, and Minimize Agricultural Environmental Damage (cont.)

Potential Outcomes that Could Result when GAO's Work Is Used

Enhanced effectiveness of federal food safety programs in addressing safety issues arising from a global food marketplace, changing regulatory approaches, and the threat of terrorism

Improvements in federal food safety agencies' actions to evaluate and regulate the safety of new technologies, such as genetically modified foods and functional foods

More agreement within the Congress on the "facts" relevant to congressional efforts to provide a cost-effective safety net to farmers (farm loan, support, and insurance programs), and to ensure American farmers and food industries a growing share of global food markets

More effective conservation and agricultural programs designed to enhance the environment

Enhanced efforts to address threats to agricultural productivity

Improved USDA organization, human capital, budgetary, and management processes

*Assess Federal Pollution Prevention and Control Strategies**Key Efforts*

- ❑ Examine current and alternative strategies to reduce air pollution
- ❑ Assess current and alternative approaches for improving the quality of the nation's surface waters
- ❑ Examine strategies for ensuring safe drinking water for all Americans, including protection from security threats and breaches
- ❑ Assess approaches for controlling the harmful effects of pesticides and toxic substances
- ❑ Examine the implications of global and transboundary environmental threats, including climate change
- ❑ Analyze the adequacy of pollution control agencies' organization, human capital, and management processes for supporting efficient and effective operations

Significance

Among quality-of-life issues, environmental protection has long been valued by Americans. During the last three decades, the nation has worked hard to limit the quantities of pollutants that degrade the nation's air, surface and ground waters, and land. The Environmental Protection Agency (EPA) has estimated that pollution control expenditures by all sectors from 1972 through 2000 totaled approximately \$2 trillion. Such efforts have yielded impressive results; for example, aggregate emissions of the six principal air pollutants have declined by 29 percent since 1970, and virtually all discharges to the nation's waters from point sources are now controlled. However, serious problems remain. Urban areas housing millions of Americans still fail to meet air quality standards, particularly during summertime high-ozone periods; and acid rain continues to degrade forests, lakes, and streams, with attendant effects on many wildlife species. An estimated 20,000 impaired water bodies must be restored to acceptable quality standards, which will require addressing heretofore little-regulated nonpoint pollution sources such as agricultural, suburban, and urban runoff. Drinking water systems will be hard-pressed to meet more stringent standards and address heightened security concerns. Many federal facilities do not fully comply with a number of environmental standards.

Several factors add complexity to the resolution of these issues, including

- decision-making systems that do not effectively integrate attainment of environmental goals with land use, transportation, and energy supply choices;
- economic and technological changes that affect the mix of pollutants emitted as well as the ability, and cost, to monitor and control emissions;
- escalating concerns about environmental justice—for example, the environmental and health effects on low-income, minority, or other special populations—with significant implications for actions such as licensing major pollution sources and waste disposal facilities;
- the looming demand for billions of dollars in federal assistance over the next decade to replace, rehabilitate, and expand facilities, such as sewage treatment plants, necessary for meeting drinking water and surface water quality standards; and
- the transboundary nature of many pollutants with global effects that require international solutions.

Assess Federal Pollution Prevention and Control Strategies (cont.)

In addition, there is interest in alternatives to traditional regulatory programs, such as those that employ pollutant trading or other market-based mechanisms, or place greater control in the hands of state or local authorities.

During the next few years, the Congress will be called upon to address these challenges as it considers reauthorization of major pollution control statutes, including the Clean Air, Clean Water, and Safe Drinking Water Acts.

Potential Outcomes that Could Result when GAO's Work Is Used

Congressional use of information, analyses, and recommendations in reauthorizing key statutes, including the Clean Air, Clean Water, and Safe Drinking Water Acts

More efficient administration of existing statutes, including alternative regulatory approaches for controlling pollution

More informed congressional decisions on funding for facilities to control pollutants in drinking water and in wastewater discharges

Enhancement of pollution control agencies' organization, human capital, and management processes

*Assess Efforts to Reduce the Threats Posed by Hazardous and Nuclear Wastes**Key Efforts*

- ❑ Assess federal and private sector progress in identifying, transporting, cleaning up, and disposing of nuclear, ordnance, and hazardous waste in a safe and cost-effective manner
- ❑ Assess federal, state, and private sector progress and performance in finding and developing environmentally acceptable sites on which to build essential waste disposal facilities
- ❑ Assess the federal government's role and financial liability for long-term stewardship of waste cleanup sites and storage and disposal facilities
- ❑ Analyze the adequacy of waste cleanup agencies' organization, human capital, and management processes for supporting efficient and effective operations

Significance

Hazardous and nuclear wastes can cause serious environmental damage lasting decades or even centuries. The problems associated with the containment and cleanup of these wastes pose major financial and management challenges to the United States that will continue well into the 21st century. Past practices have allowed health-threatening substances to seep into the land and water at thousands of federally and privately owned sites. Such seepages threaten public health and quality of life nationwide. The federal government spends almost \$10 billion annually to address health and environmental threats from Superfund and other private hazardous waste sites, remove and dispose of nuclear wastes from federal nuclear weapons facilities, and clean up hazardous waste at active and formerly used defense facilities. Such activities could ultimately cost the federal government over \$300 billion and the private sector hundreds of billions more.

Sound management practices are needed to prioritize and hasten cleanups, control costs, and develop innovative technologies. Cleanup and disposal decisions must also take into account governance issues—such as the rights of states and local communities to control land uses within their borders—and also fiscal issues—such as the need to assess the economic tradeoffs between completely cleaning up a contaminated property for reuse or simply restricting future access without complete cleanup. Moreover, terrorist activities have resulted in states and localities facing a new urgency to protect their citizens from dangers associated with the transport and storage of hazardous and nuclear wastes. The Congress also faces important policy choices, such as determining whether to proceed with the proposed disposal facility at Yucca Mountain, Nevada, for wastes from the nation's commercial nuclear reactors. Because many believe that the absence of such a facility will preclude construction of new plants, this decision has important implications for the future of nuclear power. Globally, other countries face similar concerns and decisions, and Russia has proposed to store nuclear wastes from other countries. Whether deliberating policy options, reauthorizing key statutes, or annually appropriating funds to the various federal cleanup activities, the Congress needs accurate information on the scope of the problem, the effectiveness of existing programs and activities, and the pros and cons of potential alternatives.

*Assess Efforts to Reduce the Threats Posed by Hazardous and Nuclear Wastes
(cont.)*

Potential Outcomes that Could Result when GAO's Work Is Used

An informed debate on the issues associated with waste policy, site identification and characterization, cleanup priorities, transportation, resource level and allocation, technology development, standard setting, and long-term federal roles

More effective and efficient management of cleanup activities by responsible federal agencies, including the Department of Defense, DOE, and EPA