

# Energy and Water Programs within the United States Department of Agriculture

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The United States Department of Agriculture (USDA) is one of the nation's oldest Federal departments. It employs more than 100,000 people whose work touches the lives of every American in various ways every day. It is one of the most complex departments in the Federal Government, with more than 300 programs that spend more than \$75 billion each year to help lead and manage a variety of food, agriculture, natural resources, and related programs. The USDA goals and objectives, and the implementation of its programs, are sound public policy based on the best available science. USDA works with individuals, agricultural and natural resources organizations, and units of government throughout the U.S., and in many other countries throughout the world, to enhance economic opportunities for agricultural producers and rural communities, to protect the nation's food supply, to improve nutrition and health, and to protect the nation's natural resources and environment.

Energy and water programs are critical components of the USDA. Agriculture in the U.S. is both a major consumer and producer of energy, with crops, forests and livestock requiring energy use for all aspects of production in the field, transport and processing, and conversely, the use of biofuels as a growing source of energy throughout the country. Irrigation is the largest user of freshwater in the U.S. and accounts for about 65 percent of total water withdrawals, excluding water used for thermoelectric power (Schaible 2004). Irrigation is critical in the U.S. as nearly half the value of all crops sold comes from the 16 percent of harvested cropland that is irrigated (Schaible 2004). Because energy and water are so critical

for agriculture, the USDA strives to meet emerging issues by supporting the development and use of new technology for increased energy production and energy conservation, and by providing water supply information along with technical and financial assistance to improve the management decisions affecting both water quantity and quality. This paper provides a brief overview of the many energy and water programs managed in the USDA.

## Historic Overview

The USDA was established on May 15, 1862 when President Abraham Lincoln signed the Department of Agriculture Organic Act into law. In addition to establishing this department, 1862 also saw the Homestead Act approved; the Act opened new lands for settlement and provided 160 acres of public lands to heads of families and adults. Also important was the Morrill Land Grant College Act, which donated public lands for colleges focused on agriculture and mechanical arts. The fact that this legislation passed highlights the importance which President Lincoln and Congress placed on agriculture and its place in the American society, the economy, and the future.

## Authorities and Funding

The USDA was elevated to cabinet status in 1889. USDA develops and executes policy dealing with various aspects of farming, agricultural programs and activities, and food production, distribution, and safety. In addition, the department oversees research, assistance to rural communities, conservation and protection of natural resources, and global trade.

Most funding in USDA is authorized through

legislation known as the Farm Bill, which is renewed by Congress every five years, and covers the approximately 300 USDA programs. The 15 major titles of the 2008 Farm Bill, entitled the Food, Conservation, and Energy Act of 2008, were enacted into law in June 2008. Included are the administrative and funding authorities for programs that cover income and commodity price support, farm credit, and risk management; conservation through land retirement, stewardship of land and water resources, and farmland protection; food assistance and agricultural development efforts abroad and promotion of international access to American farm products; food stamps, domestic food distribution, and nutrition initiatives; rural community and economic development initiatives, including regional development, housing, business support, renewable energy and energy efficiency, electrification, water and waste facilities, and access to telecommunications and broadband technology; research on critical areas of the agricultural and food sector; accessibility and sustainability of forests; encouraging production and use of agricultural and rural renewable energy sources; and initiatives for attracting and retaining beginning and socially disadvantaged farmers and ranchers (USDA Farm Policy Team 2008).

Within the 2008 Farm Bill, there are a number of Renewable Energy provisions. These include provisions for a Biobased Market Program, Biorefinery Assistance Program, Repowering Assistance, Bioenergy Program for Advanced Biofuels, Biodiesel Fuel Education Program, Rural Energy for America Program, Biomass Research and Development Initiative, Rural Energy Self-Sufficient Initiative, Feedstock Flexibility Program for Bioenergy Producers, Biomass Crop Assistance Program, Forest Biomass for Energy, and Community Wood Energy Program. These programs illustrate how USDA supports the development of innovative and renewable energy production and use in the U.S.

## Overview of USDA Agencies

Within USDA there are 17 different agencies that focus on specific missions for supporting agricultural activities. The main focus of these agencies were obtained from their website and are listed in the references, below, along with the

Internet link for users to access more information about the numerous and different functions of the agencies.

The Agricultural Marketing Service is responsible for developing quality grade standards for agricultural commodities, administering marketing regulatory programs, marketing agreements and orders, and making food purchases for USDA food assistance programs (United States Department of Agriculture 2009a).

The Agricultural Research Service is USDA's chief scientific research agency. Its job is finding solutions to agricultural problems that affect Americans every day, from field to table. The Service is a leader in bioenergy research and the national program on Bioenergy and Energy Alternatives is expected to reduce the nation's dependence on foreign oil, improve the environment by developing alternative energy sources, and increase production of biofuels (United States Department of Agriculture 2009b).

"Protecting American agriculture" is the basic charge of USDA's Animal and Plant Health Inspection Service that provides leadership in ensuring the health and care of animals and plants. The agency improves agricultural productivity and competitiveness and contributes to the national economy and the public health (United States Department of Agriculture 2009c).

The USDA Center for Nutrition Policy and Promotion works to improve the health and well-being of Americans by developing and promoting dietary guidance that links scientific research to the nutrition needs of consumers (United States Department of Agriculture 2009d).

The Cooperative State Research, Education, and Extension Service (CSREES) provides federal funding and leadership for research, education and extension programs. This investment in science helps solve critical issues impacting people's daily lives and the nation's future. With 60 identified program areas, CSREES collaborates with many partner organizations and institutions, namely the Land-Grant University System, to advance knowledge for agriculture, the environment, human health and well-being, and communities (United States Department of Agriculture 2009e).

The Economic Research Service is a primary source of economic information and research in the

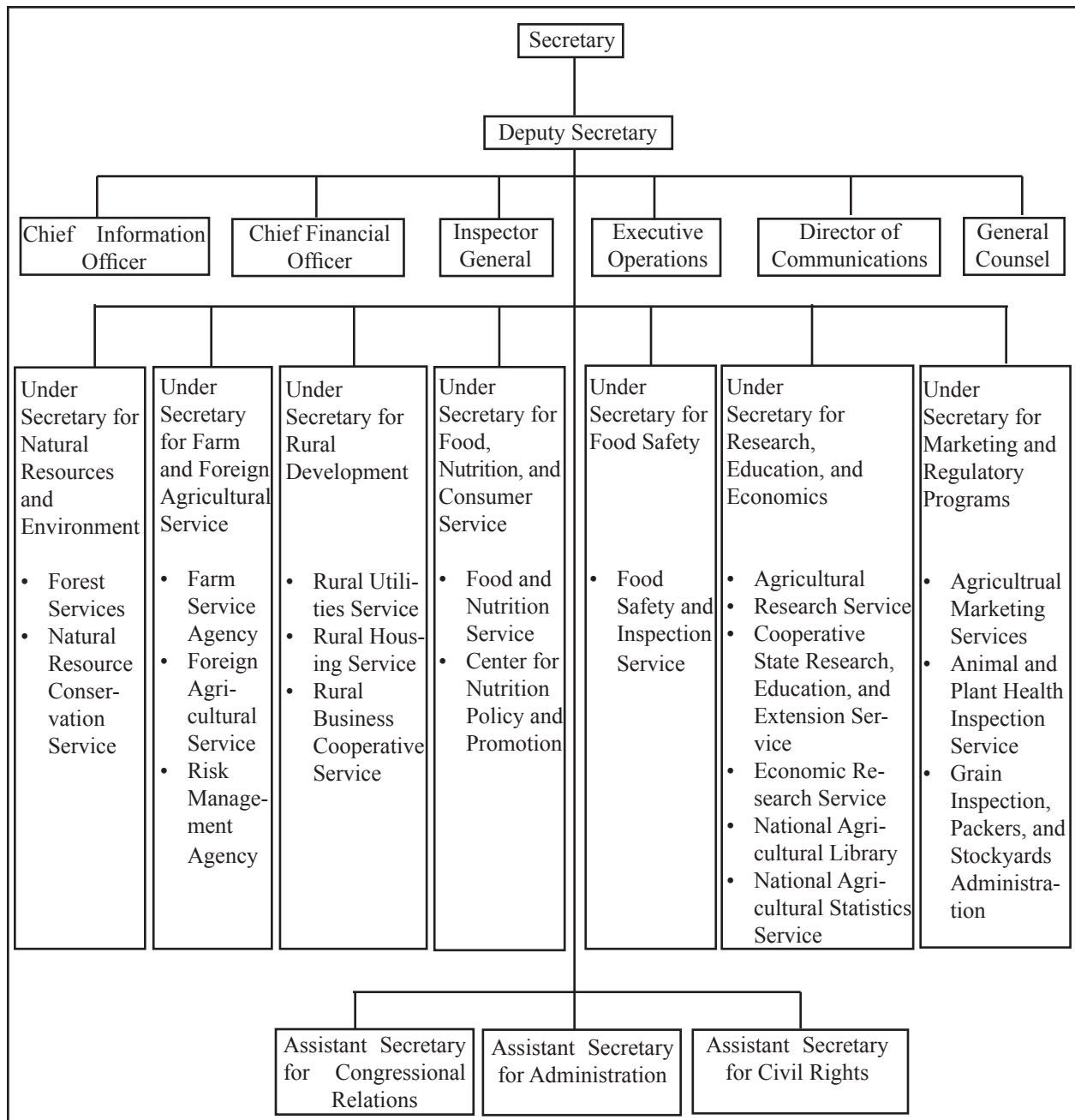


Figure 1. Flow chart of USDA agencies.

USDA. ERS conducts research programs to inform public and private decision making on economic and policy issues involving food, farming, natural resources, and rural development (United States Department of Agriculture 2009f).

The Farm Service Agency (FSA) administers and manages farm commodity, credit, conservation, disaster and loan programs as laid out by Congress through a network of Federal, state and county offices. These programs are designed to improve

the economic stability of the agricultural industry and to help farmers adjust production to meet demand. Economically, the desired result of these programs is a steady price range for agricultural commodities for both farmers and consumers (United States Department of Agriculture 2009g).

The Food and Nutrition Service (FNS) administers the food and nutrition assistance programs. FNS provides children and needy families with better access to food and a more

healthful diet through its programs and nutrition education efforts (United States Department of Agriculture 2009h).

The Food Safety and Inspection Service (FSIS) is the public health agency in USDA responsible for ensuring that the nation's commercial supply of meat, poultry, and egg products is safe, wholesome, and correctly labeled and packaged, as required by the Federal Meat Inspection Act, the Poultry Products Inspection Act, and the Egg Products Inspection Act (United States Department of Agriculture 2009i).

The Foreign Agricultural Service works to improve foreign market access for U.S. products, build new markets, improve the competitive position of U.S. agriculture in the global marketplace, and provide food aid and technical assistance to foreign countries (United States Department of Agriculture 2009j).

The Forest Service administers programs for applying sound conservation and utilization practices to natural resources of the national forests and national grasslands, for promoting these practices on all forest lands through cooperation with states and private landowners, and for carrying out extensive forest and range research (United States Department of Agriculture 2009k).

The Grain Inspection, Packers and Stockyards Administration facilitates the marketing of livestock, poultry, meat, cereals, oilseeds, and related agricultural products and promotes fair and competitive trading practices for the overall benefit of consumers and American agriculture (United States Department of Agriculture 2009l).

USDA's National Agricultural Statistics Service provides timely, accurate, and useful statistics in service to U.S. agriculture. It conducts hundreds of surveys every year and prepares reports covering virtually every aspect of U.S. agriculture. Production and supplies of food and fiber, prices paid and received by farmers, farm labor and wages, farm finances, chemical use, and changes in the demographics of U.S. producers are only a few examples (United States Department of Agriculture 2009m).

Since 1935, the Natural Resources Conservation Service (originally called the Soil Conservation Service, SCS) has provided leadership in a partnership effort to help America's private land owners and managers conserve their soil,

water, and other natural resources. The Service employees provide technical assistance based on sound science and suited to customers' specific needs. The Natural Resources Conservation Service oversees and coordinates the cooperative Snow Survey Program that provides the main source of mountainous climatic and snow data. This data is used to efficiently predict water supplies that are used by many water and energy managers in the U.S. to meet the numerous and often competing demands on this limited resource (United States Department of Agriculture 2009n).

The Risk Management Agency promotes, supports, and regulates sound risk management solutions to preserve and strengthen the economic stability of America's agricultural producers by providing crop insurance to American producers, developing and the premium rate, administering premium and expense subsidy, approving and supporting products, and reinsuring companies (United States Department of Agriculture 2009o).

USDA Rural Development's mission is to help individuals, communities, and businesses obtain the financial and technical assistance needed to increase economic opportunity and improve the quality of rural life. Through more than 40 programs, Rural Development works to make sure that rural citizens can participate fully in the global economy by funding needed infrastructure and development. Rural Development programs support the construction and modernization of essential public facilities and services such as water and sewer systems, housing, health clinics, emergency service facilities, response vehicles and electric and telecommunications service. It promotes economic development by guaranteeing loans to businesses through banks and community-managed lending pools, provides funds for micro-entrepreneurs, and funds renewable energy and energy efficiency projects. It also funds technical assistance programs to support formation of cooperatives and the establishment of small businesses (United States Department of Agriculture 2009p).

## **USDA Agencies with Direct Energy and Water Responsibilities**

Many USDA agencies deal with some aspect of energy and water research or have operational

**Table 1.** Focus of USDA Agencies with Energy and Water Research or Operational Responsibilities. (Source: [http://www.usda.gov/wps/portal/!ut/p/\\_s.7\\_0\\_A/7\\_0\\_1OB?navid=ENERGY&navtype=MS.](http://www.usda.gov/wps/portal/!ut/p/_s.7_0_A/7_0_1OB?navid=ENERGY&navtype=MS.))

Agency	Energy Programs	Water Programs
Departmental Administration	Alternative Fuel Vehicle/ Alternative Fuels BioPreferred Biobased Product Procurement Biodiesel Board	
Agricultural Research Service (ARS)	Bioenergy and Energy Alternatives Sucrose, Starch, and Other Non-Cellulosic Polysaccharide Feedstocks Oil & Fat Feedstocks Future Fuels Ligno-Cellulosic Feedstocks - Design, Production, Logistics, and Conversion Agricultural Energy Systems	Water Availability and Watershed Management Program Water Resource Management Program
Cooperative State Research Education and Extension Service (CSREES)	Agricultural Materials Program Natural Research Initiative (NRI) Sustainable Agriculture Research and Education (SARE) Small Business Innovation Research (SBIR)	Research funded by CSREES provides the basic knowledge needed to address water quality and quantity issues in rural and agricultural watersheds Extension and other outreach programs Education activities
Economic Research Service (ERS)	Bioenergy Information and Research Program	Ongoing bioenergy research focuses on domestic and global markets; economywide, regional, and household effects; natural resource, environmental, and rural community impacts; and implications for food prices
Farm Service Agency (FSA)	Bioenergy Program	Wide variety of programs for agricultural producers to improve water quality CRP Loans to finance confined animal feeding operations (CAFOs)
National Agricultural Library		Water Quality Information Center (WQIC) Alternative Farming Systems Information Center (includes water conservation and water-saving irrigation techniques)
Natural Resources Conservation Service (NRCS)	Conservation Technical Assistance (CTA) Environmental Quality Incentive Program (EQIP) Conservation Security Program (CSP) Resource Conservation and Development (RC&D) Program	National Water and Climate Center – Snow Survey and Water Supply Forecasts National Water Management Center National Technology Support Center National Water Management Center Conservation Technical Assistance Watershed Science Institute Wetlands Reserve Program Wildlife Habitat Incentives Program Environmental Quality Incentives Program Emergency Watershed Protection National Resources Inventory State of the Land: Maps and analysis (Irrigation, Water Quality, Water Supply) Stream Corridor Restoration Watershed Planning Agricultural Waste Management Watershed Protection and Flood Prevention

**Table 1.** Focus of USDA Agencies with Energy and Water Research or Operational Responsibilities. (Continued)

Agency	Energy Programs	Water Programs
Forest Service (FS)	Fuels for Schools and Beyond Forest Service Research for Bioenergy, Biobased and Energy Related Products Forest Products Laboratory Woody Biomass Utilization Grant Program Permitting of energy development on FS lands	Management of public lands water including Watershed Improvement, Surface Water Hydrology, Ground Water Hydrology, and Riparian & Wetlands Fire suppression and burned area rehabilitation Stream Team Watershed Publications
Rural Development	Electric Hardship Loans Electric Municipal Rate Loans Electric Treasury Rate Loans Electric FFB Direct Loans Electric High Cost Energy Grants Value-Added Producer Grant Program Section 9003 Biorefinery Assistance Program Section 9004 Repowering Assistance Section 9005 Bioenergy Program for Advanced Biofuels Section 9007 Rural Energy for America Program Business Programs Rural Economic Development Loans and Grants Business and Industry Guaranteed Loan Program	Water and Environmental Programs (WEP) Water and Waste Disposal Loans Water and Waste Disposal Grants Technical Assistance and Training (TAT) Grants Solid Waste Management Grants Emergency Community Water Assistance Grants Rural Water Circuit Rider Technical Assistance

responsibilities. In fact, the Forest Service was established by the Transform Act of 1905 in order to protect the nation's water and timber resources. Today, the Forest Service manages the majority of the western watersheds where a large percent of the western water supply falls as snow, accumulates and melts providing the annual streamflow to meet numerous energy and water needs in the populated valleys.

USDA energy programs and initiatives enable farmers, rural residents, and the nation to better respond to energy-related issues and opportunities. The range of activities include research and development, outreach and education, technical and financial assistance, energy efficient farming techniques, rural electrification and infrastructure loans, wind farms, ethanol plants, biorefinery support, funding for small hydroelectric projects, and biochemical and genomics research (United States Department of Agriculture 2009q).

Some of the programs dealing with energy and water within specific agencies are listed in Table 1. Additional information is available at the USDA Energy web page along with a matrix to view

various programs covered by the many agencies within USDA.

## Summary

Agriculture is a large user of electricity and water. The ability to conserve energy and water while producing food and fiber has broad impacts on the nation. For these reasons, USDA is heavily involved with energy use and with maintaining and enhancing the quality and quantity of water available for multiple uses. The wide variety of water and energy activities within the USDA are reflective of the broad mission of the Department. The 100,000 employees of USDA touch the lives of every American every day. Follow the agency's internet web pages to learn more about the work that the United States Department of Agriculture is accomplishing today to meet tomorrow's energy and water concerns.

## Author Bios and Contact Information

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Service, USDA-NRCS, in Boise, Idaho. Idaho NRCS oversees the coordination and collection of snow survey data and provides snowmelt streamflow water supply forecasts. Ron provides current information to numerous public and private users to keep them aware of Idaho's ever changing snowpack and water supply conditions. He can be contacted at Ron.Abramovich@id.usda.gov.

**Michael Strobel** is the Director of the National Water and Climate Center (NWCC), USDA-NRCS, in Portland, Oregon. NWCC oversees the Snow Survey and Water Supply Forecasting Program that operates over 780 SNOTEL stations in the western US and provides water supply forecasts. NWCC also oversees the Soil Climate Analysis Network (SCAN) and a wide range of climate services for NRCS and its partners. He can be contacted at michael.strobel@por.usda.gov.

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