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Report to the Ranking Democratic Member, Committee on Agriculture, Nutrition, and Forestry, U.S. Senate

September 2006

AGRICULTURAL CONSERVATION

USDA Should Improve Its Process for Allocating Funds to States for the Environmental Quality Incentives Program

GAO-06-969

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Highlights

Highlights of GAO-06-969, a report to the Ranking Democratic Member, Committee on Agriculture, Nutrition, and Forestry, U.S. Senate

Why GAO Did This Study

The Environmental Quality Incentives Program (EQIP) assists agricultural producers who install conservation practices, such as planting vegetation along streams and installing waste storage facilities, to address impairments to water, air, and soil caused by agriculture or to conserve water. EQIP is a voluntary program managed by the U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS). NRCS allocates about $1 billion in financial and technical assistance funds to states annually. About $650 million of the funds are allocated through a general financial assistance formula.

As requested, GAO reviewed whether USDA's process for allocating EQIP funds to states is consistent with the program's purposes and whether USDA has developed outcome-based measures to monitor program performance. To address these issues, GAO, in part, examined the factors and weights in the general financial assistance formula.

What GAO Recommends

GAO recommends, among other things, that NRCS document its rationale for the factors and weights in its general financial assistance formula and use current and accurate data. USDA agreed with GAO that the formula needed review. USDA did not agree with GAO's view that NRCS's funding process does not clearly link to EQIP's purpose of optimizing environmental benefits. It believes that the funding process clearly links to EQIP's purpose, but it has not documented the link.

www.gao.gov/cgi-bin/getrpt?GAO-06-969.

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

What GAO Found

NRCS's process for providing EQIP funds to states is not clearly linked to the program's purpose of optimizing environmental benefits; as such, NRCS may not be directing funds to states with the most significant environmental concerns arising from agricultural production. To allocate most EQIP funds, NRCS uses a general financial assistance formula that consists of 31 factors, including such measures as acres of cropland, miles of impaired rivers and streams, and acres of specialty cropland. However, this formula has several weaknesses. In particular, while the 31 factors in the financial assistance formula and the weights associated with each factor give the formula an appearance of precision, NRCS does not have a specific, documented rationale for (1) why it included each factor in the formula, (2) how it assigns and adjusts the weight for each factor, and (3) how each factor contributes to accomplishing the program's purpose of optimizing environmental benefits. Factors and weights are important because a small adjustment can shift the amount of funding allocated to each state on the basis of that factor and, ultimately, the amount of money each state receives. For example, in 2006, a 1 percent increase in the weight of any factor would have resulted in $6.5 million more allocated on the basis of that factor and a reduction of 1 percent in money allocated for other factors. In addition to weaknesses in documenting the design of the formula, some data NRCS uses in the formula to make financial decisions are questionable or outdated. For example, the formula does not use the most recent data available for 6 of the 31 factors, including commercial fertilizers applied to cropland. As a result, any recent changes in a state's agricultural or environmental status are not reflected in the funding for these factors. During the course of GAO's review, NRCS announced plans to reassess its EQIP financial assistance formula.

NRCS recently developed a set of long-term, outcome-based performance measures to assess changes to the environment resulting from EQIP practices. The agency is also in the process of developing computer models and other data collection methods that will allow it to assess these measures. Thus, over time, NRCS should ultimately have more complete information on which to gauge program performance and better direct EQIP funds to areas of the country that need the most improvement.

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Abbreviations

CAFO	Concentrated Animal Feeding Operations
EQIP	Environmental Quality Incentives Program
NRCS	Natural Resources Conservation Service
NRI	National Resources Inventory
USDA	U.S. Department of Agriculture

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United States Government Accountability Office
Washington, D.C. 20548

September 22, 2006

The Honorable Tom Harkin
Ranking Democratic Member
Committee on Agriculture, Nutrition, and Forestry
United States Senate

Dear Senator Harkin:

Approximately two-thirds of the continental U.S.'s land area is used as range, forest, crop, or pasture land. The production of food and fiber on these lands contributes to the health of the U.S. population and the strength of the nation's economy. If not properly managed, however, agricultural production on these lands can damage the environment and the nation's natural resources, as when routine agricultural activities produce sediment, fertilizer runoff, and animal waste that can impair the nation's waterways. Improper management of natural resources can also reduce the productive capacity of agricultural land; for example, excessive soil erosion may lead to soil lacking in nutrients. Agriculture is also a major user of both groundwater and surface water, contributing, in part, to water scarcity in the western United States. Responsible production management practices can mitigate many of these problems.

The Environmental Quality Incentives Program (EQIP) provides financial and technical assistance to agricultural producers who enter into contracts with the U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) to install conservation practices on their land. A primary purpose of EQIP is to optimize the environmental benefits achieved using program funds. Managed by NRCS, EQIP is a voluntary program established in 1996 that currently provides about $1 billion annually in cost-share and incentive payments to farmers and ranchers in all 50 states, as well as U.S. territories, whose production practices may put soil, water, air, and related natural resources at risk for environmental damage.[1] The program provides funds to help implement conservation practices, such as planting vegetation along rivers and streams—known as riparian buffers—to prevent sediment and other materials from polluting the waters, and constructing waste storage facilities to reduce the level of

[1]The Commonwealth of Puerto Rico, the U.S. Virgin Islands, and Pacific Basin territories also receive EQIP assistance. For the purposes of this report, these are referred to as states, with Puerto Rico and the U.S. Virgin Islands considered a single entity under EQIP.

nutrients from livestock production that enter neighboring bodies of water. The Farm Security and Rural Investment Act of 2002 (the act) reauthorized EQIP and increased annual authorized program funding from about $200 million in 1997 to current levels of over $1 billion.[2]

NRCS allocates the majority of EQIP funds through a general financial assistance formula with 31 factors related to the availability of natural resources and the presence of environmental concerns or problems. NRCS assigns each of the formula's factors a weight that determines the funds to be allocated to states based on that factor. The agency also periodically modifies factor weights. Additional funds are distributed using a second technical assistance formula that considers ongoing and expected future conservation work, as well as through a performance bonus formula designed to reward states for optimizing environmental benefits and efficient program management.[3] States disburse EQIP funds to producers to install conservation practices on their land.

As requested, we assessed the extent to which (1) USDA's process for providing funds to the states is consistent with the program's purpose of optimizing environmental benefits and (2) USDA has developed measures to monitor program performance.

To address these issues, we reviewed relevant statutory provisions and NRCS's regulations and guidelines for implementing EQIP and spoke with officials in NRCS's national headquarters. To review NRCS's efforts to allocate EQIP funding to the states, we analyzed documents accounting for NRCS's disbursements of EQIP funds. We examined the factors and weights in the formula for general financial assistance and discussed the role of the data source for each factor in the formula with NRCS's EQIP officials. We gathered comments from stakeholders about the strengths and weaknesses of NRCS's EQIP funding approach, selecting stakeholders from environmental and farm organizations to obtain a broad set of views on the effectiveness of the formula in allocating funds. To evaluate the

[2]Pub. L. No. 107-171, § 2701, 116 Stat. 134, 278 (2002).

[3]EQIP money is also provided to states for practices that promote groundwater and surface water conservation, water conservation activities in the Klamath Basin in California and Oregon, salinity control measures in the Colorado River Basin, and through grants to encourage innovative conservation practices. Regional equity funding is provided to ensure all states receive at least $12 million from a total of five USDA conservation programs, including EQIP. In fiscal year 2006, the threshold was lowered administratively to $11 million.

extent to which NRCS has developed sufficient outcome-based measures to monitor program performance, we spoke with representatives from the NRCS teams responsible for strategic planning and oversight activities and representatives from the EQIP program team. We examined documentation of EQIP performance measures and reviewed NRCS's Performance Results System.

A more detailed description of our objectives, scope and methodology is presented in appendix I. We performed our work between December 2005 and August 2006 in accordance with generally accepted government auditing standards.

Results in Brief

NRCS's funding process is not clearly linked to EQIP's purpose of optimizing environmental benefits; as such, NRCS may not be directing EQIP funds to states with the most significant environmental concerns arising from agricultural production. NRCS's general financial assistance formula has several weaknesses that raise questions about the formula's usefulness for effectively directing funds to states. Specifically, while the 31 factors in the financial assistance formula, and the weights associated with each factor, give the formula an appearance of precision, NRCS does not have a specific, documented rationale for why it included each factor in the formula or for how it assigns and periodically adjusts factor weights. Factors and weights are important for ensuring that funds are distributed to states to address the nation's most significant environmental problems arising from agriculture. Small adjustments in the weights of the factors can shift the amount of funding directed at a particular resource concern and, ultimately, the amount of money each state receives. For example, in 2006, a 1 percent increase in the weight of any of the 31 factors would have resulted in $6.5 million more allocated on the basis of that factor at the expense of other factors. In addition, some data in the EQIP financial assistance formula is questionable or outdated. First, 5 of the data sources—such as acres of nonirrigated cropland and federal grazing land—were used in the formula more than once. Using the same data for multiple factors may result in factors being indirectly weighted more than intended and may make the formula less reliable for allocating state funding. Second, NRCS could not identify the source of the data used in 10 of the 31 factors in the formula, such as livestock animal units and animal waste generation and, therefore, we could not verify the accuracy of the data or the basis on which the agency was allocating funding. Finally, the formula does not use the most current data available for at least 6 of the 31 factors. For example, the formula uses 1995 data to measure commercial fertilizer

use on cropland, but we identified 2005 data that would have made this factor more current. Because it was not clear how NRCS originally calculated this data, we could not quantify the effect of using more recent data. However, using less recent data raises questions about whether the formula allocates funds to areas of the country that currently have the greatest environmental needs. When we brought our concerns to NRCS's attention, officials agreed that the formula, including weights and data sources, needed to be reviewed. NRCS subsequently announced plans to issue a request for proposal soliciting comments and suggested revisions to NRCS's formulas for allocating conservation funds, including the EQIP financial assistance formula.

As part of its 2005 strategic planning effort, NRCS developed long-term, outcome-based measures to assess changes to the environment resulting from EQIP practices. NRCS has developed baselines for these measures and plans to assess and report on them once computer models and other data collection methods that estimate environmental change are completed. In the meantime, NRCS will continue to use the results of its existing annual measures to assess performance. As NRCS collects additional data about its accomplishment of long-term performance measures, it may ultimately have more complete information on which to gauge program performance. Such information could help the agency refine its process for allocating funds to the states via its financial assistance formula by directing funds toward areas of the country that need the most improvement.

We are making recommendations to the Secretary of Agriculture to better align NRCS's process for allocating EQIP funds with the program's stated purpose of optimizing environmental benefits. In particular, we are recommending that NRCS ensures that its rationale for the factors and weights is documented and linked to program priorities, its data sources are accurate and current, and it uses information about long-term program performance to ensure funds are directed to areas of the highest priority. We provided USDA with a draft of this report for review and comment. USDA agreed that the EQIP allocation formula needs review. USDA did not agree with our assessment that NRCS's funding process lacks a clear link to the program's purpose of optimizing environmental benefits. The agency stated that its use of factors related to the natural resource base and condition of those resources shows the general financial assistance formula is tied to the program's purpose of optimizing environmental benefits. USDA also stated that, while some formula data sources and weights will be updated, the types of factors used would be needed in any

process that attempts to inventory and optimize environmental benefits. While this may in fact be the case, USDA needs to document this connection—that is, why factors were chosen and weights assigned. USDA could make the connection between the formula and the program's purpose of optimizing environmental benefits more evident if it provided additional information describing its reasons for including or excluding factors in the formula and its rationale for assigning and modifying weights.

Background

The U.S. agricultural sector benefits our economy and the health of our nation. However, if not properly managed, agricultural activities can impair the nation's water, air, and soil; disrupt habitat for endangered species; and constrain groundwater resources. For example, sediment produced during routine agricultural activities may run off the land and reach surface waters, including rivers and lakes. Sediment can destroy or degrade aquatic habitat and can further impair water quality by transporting into area waters both the pesticides applied to cropland and the nutrients found in fertilizers and animal waste.[4] These and other water quality issues are of concern in a number of U.S. agriculture-producing regions, including the Midwest and along the Mississippi River. Agriculture is also a major user of groundwater and surface water, which has led to water resource concerns across the country, particularly in the West. In 2000, irrigation accounted for 65 percent of the nation's consumption of fresh water. Agricultural production can also impair air quality, when wind carries eroded soil, odors, and smoke, and may lead to the loss of wetlands, which provide wildlife habitat, filter pollutants, retain sediment, and moderate hydrologic extremes.

EQIP is one of a number of USDA conservation programs designed to mitigate agriculture's potentially negative environmental effects. EQIP provides cost-share funds and incentive payments for land used for agricultural production and supports around 190 conservation practices, including constructing facilities to temporarily store animal waste; planting rows of trees or shrubs to reduce wind erosion and provide food for wildlife; and planning the amount, form, placement, and timing of the application of plant nutrients. EQIP is designed to fund conservation

[4]Nutrients such as nitrogen and phosphorous often exist in large quantities on farms with animal feeding operations—facilities where animals are fed and raised in confined or semiconfined conditions.

practices in a manner that helps the program achieve the following national priorities identified by NRCS:

- reducing nonpoint source pollution (nutrients, sediment, pesticides, or excess salinity), groundwater contamination, and pollution from point sources (such as concentrated animal feeding operations);
- conserving groundwater and surface water resources;
- reducing emissions that contribute to air quality impairment;
- reducing soil erosion from unacceptable levels on agricultural land; and
- promoting at-risk species habitat conservation.

The Federal Agriculture Improvement and Reform Act of 1996 created EQIP by combining four existing conservation programs into a single program.[5] The Farm Security and Rural Investment Act of 2002, the farm bill, reauthorized EQIP and increased its authorized funding from about $200 million in 1997 to current levels of over $1 billion.[6] The 2002 act required that at least 60 percent of EQIP funds be made available for conservation practices relating to livestock production.[7] In addition, it authorized EQIP funds for specific conservation purposes—(1) funds for producers to install water conservation practices to improve groundwater and surface water conservation (the Ground and Surface Water Conservation component of EQIP) and (2) funds for water conservation

[5]Pub. L. No. 104-127, § 334, 110 Stat. 888, 997 (1996). The act combined the Agricultural Conservation Program, Great Plains Conservation Program, Water Quality Incentives Program, and Colorado River Basin Salinity Control Program into the EQIP program.

[6]EQIP is funded through USDA's Commodity Credit Corporation. The 2002 Farm Bill authorized $1.2 billion using the funds, facilities, and authorities of the Commodity Credit Corporation to carry out the EQIP program for fiscal year 2006. 16 U.S.C. § 3841(a)(6). However, in the annual appropriations act for fiscal year 2006, Congress capped program funding for EQIP by limiting the amount of funding available to pay salaries and expenses of personnel in carrying out EQIP to $1.017 billion. Pub. L. No. 109-97, § 735, 119 Stat. 2155 (2005). Similarly, for fiscal years 2003 through 2005, Congress has capped funding levels for EQIP at levels below those authorized in the 2002 Farm Bill.

[7]The 1996 act required that 50 percent of EQIP funding be targeted at practices relating to livestock production.

practices in the Klamath Basin located on the California/Oregon border (the Klamath Basin component of EQIP).[8]

Annually, NRCS headquarters officials determine the amount of funding each state receives, while state and local NRCS officials decide what conservation practices to fund in their state and local communities. The total amount of EQIP funding a state receives can be derived by adding together that state's funding for all categories. Table 1 describes the different categories of funding that states received for fiscal year 2006 and NRCS's process for allocating that funding.

Table 1: Fiscal Year 2006 Categories of EQIP Funding

EQIP funding category	Funding purpose	Process for allocating funding	Percentage of total funding
General financial assistance	Cost-share and incentive payments for installing conservation practices.	Funds are divided among states using a 31-factor formula that considers the presence of available natural resources and environmental concerns in each state. Each factor is assigned a weight, which determines the amount of money to be given to states based on that factor.	65%
General technical assistance	Funds for technical specialists' time. Among other activities, specialists process EQIP administrative paperwork, advise farmers about the installation of practices, and inspect installed practices.	Technical assistance dollars are divided among states based on the number of ongoing EQIP contracts and expected future technical specialist needs.	19
Ground and Surface Water Conservation[a]	Funds for conservation practices that improve groundwater and surface water conservation. Practices must result in a net savings of groundwater or surface water resources.	Groundwater and surface water funds are allocated to eight High Plains Aquifer states, nine western drought states, and other states with agricultural water needs using a formula based on groundwater, irrigation, and other agricultural water usage factors.	7
Performance incentive bonuses[a]	Bonuses designed to reward states that achieve a high level of program efficiency and optimize environmental benefits. States can use bonuses as they do other EQIP financial and technical assistance.	Performance bonuses are divided among states using a formula with seven factors.	4

[8]The act authorized $360 million from 2002 to 2007 for these components of EQIP.

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EQIP funding category	Funding purpose	Process for allocating funding	Percentage of total funding
EQIP Colorado Salinity[a]	Funds for salinity control measures in the Colorado River Basin.	Colorado Salinity dollars are divided between Colorado, Utah, and Wyoming based on the amount of land in each state needing salinity control treatment.	2
EQIP regional equity[a]	Funds provided to states that receive less than $12 million from NRCS conservation programs (including EQIP) in a given fiscal year.[b] States can use funds as they do other EQIP financial and technical assistance.	Regional equity funds are provided to states that receive less than $12 million from NRCS conservation programs (including EQIP) in a given fiscal year.[b] Headquarters officials determine the amount of funds to be provided to each state and from which program the funds will come.	2
Klamath Basin[a]	Funds to carry out water conservation activities in the Klamath Basin in California and Oregon.	Klamath Basin funding is split evenly between California and Oregon.	1%

Source: GAO analysis of NRCS documentation.

Note: EQIP funds are also provided to producers through Conservation Innovation Grants, funds competitively awarded for the development and adoption of innovative conservation approaches and technologies. In fiscal year 2006, around $20 million in grants was approved by NRCS. Conservation Innovation Grants are awarded through national and state competitions to producers demonstrating innovative approaches to conservation. Because the grant money for national competitions is not provided to states along with their initial EQIP allocations, it is not reflected in this table.

[a]NRCS provides these funds to the states through both financial and technical assistance; the majority of the assistance is in the form of financial assistance.

[b]In fiscal year 2006, the threshold was lowered administratively to $11 million.

As the table shows, each category of EQIP funding is allocated to the states using a different process. For the general financial assistance formula, the availability of natural resources accounts for approximately half of the funds allocated, and the presence of environmental concerns or problems accounts for the remainder.[9] Table 2 shows the factors and weights used in the financial assistance formula for fiscal year 2006.

[9]Other USDA conservation programs, such as the Conservation Technical Assistance Program, Farm and Ranch Lands Protection Program, and Wildlife Habitat Incentives Program, also use formulas to allocate funding.

Table 2: EQIP General Financial Assistance Formula Factors and Weights, Fiscal Year 2006

Factor[a]	Weight
Acres of nonirrigated cropland	3.2
Acres of irrigated cropland	4.3
Acres of federal grazing lands	0.5
Acres of nonfederal grazing lands	4.3
Acres of forestlands	1.1
Acres of specialty cropland	3.2
Acres of wetlands and at-risk species habitat	4.6
Acres of bodies of water	3.2
Livestock animal units[b]	5.8
Animal waste generation	5.8
Waste management capital cost	3.5
Acres of American Indian tribal lands	3.3
Number of limited resource producers	5.0
Acres of grazing land lost to conversion	0.8
Air quality nonattainment areas	1.4
Acres of pastureland needing treatment	5.5
Acres of cropland eroding above T[c]	6.2
Acres of fair and poor rangeland	6.2
Acres of forestlands eroding above T[c]	1.4
Acres of cropland and pastureland soils affected by saline and/or sodic conditions[d]	2.6
Miles of impaired rivers and streams	3.6
Potential for pesticide and nitrogen leaching	1.3
Potential for pesticide and nitrogen runoff	1.7
Ratio of livestock animal units to cropland	1.7
Number of concentrated animal feeding operations/animal feeding operations[e]	2.8
Ratio of commercial fertilizers to cropland	0.9
Wind erosion above T[c]	4.2
Phosphorous runoff potential	3.9
Riparian areas	0.8
Carbon sequestration	3.6
Coastal zone land	3.6

Source: NRCS.

[a]The factor names in this chart are NRCS terminology. In certain cases, they may not represent what is actually being measured. For example, the factor for acres of cropland and pastureland soils affected

by saline and/or sodic conditions only measures the presence of salts on cropland and pastureland and does not include data on the presence of sodium on these lands.

[b]Animal units are a standard way of quantifying livestock of different types and sizes (e.g., cattle, dairy, poultry, etc.) One animal unit is equivalent to 1,000 pounds of live animal weight.

[c]T is a term that refers to a tolerable rate of erosion. T is the maximum rate of annual soil loss that will permit crop productivity to be sustained economically and indefinitely on a given soil.

[d]Saline and sodic soils are soils that contain salts and sodium. Excess amounts of salt and sodium in soils may adversely affect soil quality and crop productivity.

[e]Animal feeding operations are facilities where animals are raised in confined or semiconfined situations usually with feed brought to the animals. When large enough or when in environmentally sensitive locations, these facilities are designated as concentrated animal feeding operations and become subject to regulatory requirements to prevent point source pollution.

In fiscal year 2006, approximately $652 million was divided among the states through the general financial assistance formula.[10] For example, according to the formula, EQIP funding for nonirrigated cropland (accounting for 3.2 percent of financial assistance) totaled $20.9 million. The state with the most acres of nonirrigated cropland received $1.7 million of the funds associated with this factor, and the state with the fewest acres of nonirrigated cropland received approximately $1,100. A state's total allocation is composed of the funds it receives for each of the 31 factors.

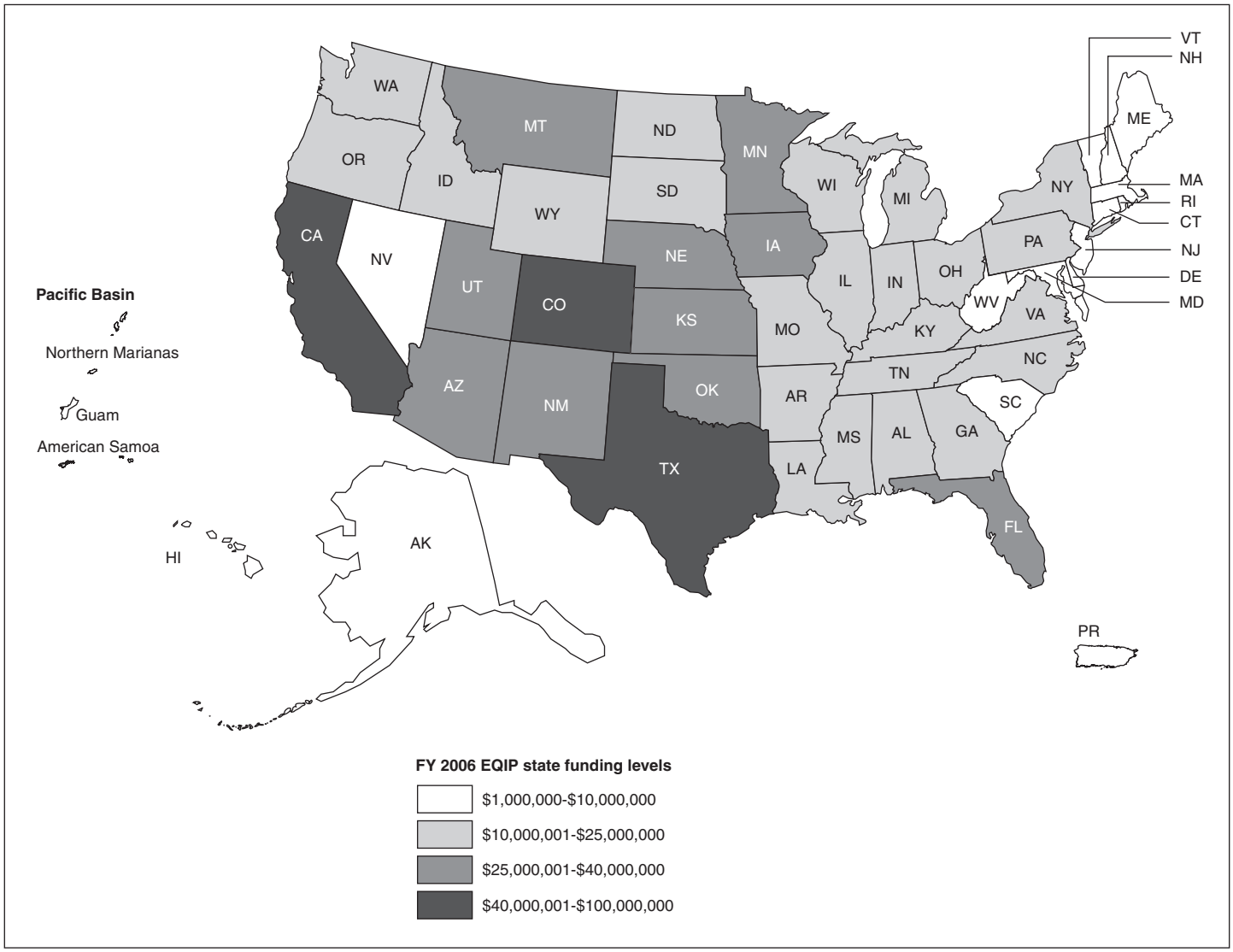
Although about 65 percent of EQIP funds are provided through the general financial assistance formula, other categories of funding can have a significant effect on the total amount of funds an individual state receives. For example, 35 percent of Utah's fiscal year 2006 allocation was from general financial assistance. The largest category of EQIP funds Utah received—38 percent—was Colorado Salinity funds. Appendix II provides additional information on the 2006 funding allocation formulas for general financial assistance, Ground and Surface Water Conservation, performance incentive bonuses and Klamath Basin funding categories.

Figure 1 shows the initial distribution of NRCS's fiscal year 2006 EQIP allocations to the states in November 2005. States had to return any unused funds by June 2006 for redistribution to states with a need for additional

[10]More specifically, approximately $662.6 million was allocated for general financial assistance in fiscal year 2006. Of that, $652 million was allocated among the 48 continental states. The remainder—$10.6 million—was provided to Alaska, Hawaii, the Pacific Basin, and Puerto Rico and the U.S Virgin Islands—states and territories for which NRCS does not have consistent data reflecting the availability of natural resources and the extent of environmental problems. NRCS allocates money for these states separately from its allocations for the other 48 states.

funds. Appendix IV describes the amount of funding each state initially received in fiscal year 2006.

Figure 1: Initial EQIP Funding to States, Fiscal Year 2006



Source: Art Explosion (map); GAO analysis of NRCS documentation.

NRCS's Process for Allocating EQIP Funds to the States Does Not Clearly Address the Program's Purpose of Optimizing Environmental Benefits

NRCS's process for providing EQIP funds to the states is not clearly linked to the program's purpose of optimizing environmental benefits. In particular, NRCS's general financial assistance formula, which accounts for approximately two-thirds of funding provided to the states, does not have a specific, documented rationale for each of the formula's factors and weights. In addition, the financial assistance formula relies on some questionable and outdated data. As a result, NRCS may not be directing EQIP funds to states with the most significant environmental concerns arising from agricultural production.

NRCS Does Not Have A Specific, Documented Rationale for Formula Factors and Weights

Although the 31 factors and weights used in the general financial assistance formula give it an appearance of precision, NRCS does not have a clearly documented rationale for including each factor in the formula and assigning or modifying each weight. The original EQIP formula was created in 1997 by an interagency task force that modified the formula created for a different conservation program—the Conservation Technical Assistance Program.[11] The task force added and deleted factors and adjusted factor weights so that the EQIP formula better corresponded to the Federal Agriculture Improvement and Reform Act of 1996's requirement that 50 percent of funds be targeted at funding livestock-related practices.

Since the creation of the financial assistance formula, NRCS has periodically modified factors and weights to emphasize different program elements and national priorities, most recently in fiscal year 2004 following the passage of the 2002 Farm Security and Rural Investment Act. Furthermore, NRCS officials stated that they meet annually to review the allocation of funds to states. However, throughout this process, NRCS has not documented the basis for its decisions to modify factors and weights or documented how changes to its formula achieve the program's purpose of optimizing environmental benefits. Thus, it is not always clear whether the formula factors and weights guide funds to the states as effectively as possible. For example, it is unclear why NRCS includes a factor in the formula that addresses the waste management costs of small animal feeding operations but not a factor that addresses such costs for large

[11]The Conservation Technical Assistance Program provides technical assistance to help people conserve, maintain, and improve their natural resources.

operations—large operations can also damage the environment and are eligible for EQIP funding.[12] By not including the costs of the larger operations in its financial assistance formula, some states may not be receiving funds to address their specific environmental concerns. In addition, NRCS has not demonstrated that it has the most appropriate water quality factors in its formula. For example, the formula includes a factor addressing river and stream impairment but no factor for impaired lakes and other bodies of water. Moreover, it is not certain whether the impaired rivers and streams factor results in funds being awarded on the basis of general water quality concerns or water pollution specifically caused by agricultural production. As a result, it was not certain whether the formula allocates funds as effectively as possible to states with water quality concerns arising from agricultural production.

While the factors in the EQIP general financial assistance formula determine what resource and environmental characteristics are considered when allocating funds, the weights associated with these factors directly affect how much total funding is provided for each factor and, thus, the amount of money each state receives. Factors and weights are key to ensuring states with the greatest environmental problems receive funding to address these problems. Small differences in the weights of the factors can shift the amount of financial assistance directed at a particular resource concern and, ultimately, the amount of money provided to a state. In 2006, if the weight of any of the 31 factors had increased by 1 percent, $6.5 million would have been allocated on the basis of that factor at the expense of one or more other factors. Such a shift could impact the amount of financial assistance received by each state. For example, a 1 percent increase in the weight of the specialty cropland factor with a corresponding decrease of 1 percent in the American Indian tribal land factor could result in large changes to the distribution of EQIP general financial assistance. According to our analysis, the state benefiting the most from such a change would receive $2.6 million more (a 7.2 percent increase in that state's level of general financial assistance) and the state benefiting least from such a change would lose $2.7 million (a 13.5 percent decrease in that state's level of general financial assistance). The potential for the weights to significantly affect the amount of funding a state receives underscores the

[12]The waste management capital cost factor considers the costs associated with animal feeding operations with fewer than 1,000 animal units. It does not include the costs of operations with more than 1,000 animal units. Since 2002, operations with more than 1,000 animal units have been eligible to receive EQIP funding for waste storage facilities.

importance of having a well-founded rationale for assigning them. To date, NRCS has not documented its rationale for choosing the weights.

Some stakeholders we spoke with questioned NRCS's assignment of weights to certain factors in the financial assistance formula because they did not believe NRCS's formula adequately reflected the states' environmental priorities. For example, NRCS's general financial assistance formula allocates 6.3 percent of EQIP funds to the states based on factors specifically associated with animal feeding operations.[13] However, states spent more of their EQIP financial assistance on related practices, which suggests that the weights in the financial assistance formula may not reflect states' priorities. In fiscal year 2005, states spent a total of 11 percent of EQIP financial assistance, or $91.1 million, on one such practice—the construction of waste storage facilities for animal feeding operations. (App. VI outlines the practices funded in fiscal year 2005, including other practices to control pollution from animal feeding operations.) More generally, other stakeholders said that, as the program develops, NRCS should give additional weight to factors related to the presence of environmental concerns in a state and place less emphasis on factors related to natural resources in a state. They believed this reassignment of weights would better ensure that states contending with the most significant environmental problems receive the most funding. Currently, factors related to the presence of environmental concerns account for approximately half of the total funding, while factors relating to the availability of natural resources account for the remainder. Factors related to the availability of natural resources provide states that have significant amounts of a particular type of land—such as grazing land or cropland—with more funds, regardless of whether that land is impaired.

Although NRCS has stated that it meets annually to review its allocation of funds to states, officials told us they had not conducted any statistical analysis to examine the influence of factors on funding outcomes. Statistical analyses can provide information on how the factors in the allocation formula have affected the distribution of funds, thereby

[13]The financial assistance formula allocates 3.5 percent of funds using the waste management capital cost factor and 2.8 percent using the number of concentrated animal feeding operations/animal feeding operations factor. According to NRCS officials, states with animal feeding operations may receive additional funds based on the livestock animal units, animal waste generation, and ratio of animal units to cropland formula factors.

providing information to improve program implementation.[14] To better understand the effect of the factors on the allocations to states, we used two types of statistical analysis to assess the effects of the EQIP financial assistance formula on state funding: (1) regression analysis to show which factors are the most influential in determining funding levels and (2) factor analysis to understand how factors can be grouped and identified with program priorities.

Our regression analysis for the fiscal year 2006 funding allocation shows that the factors that were the most important in explaining the distribution of general financial assistance to states were acres of fair and poor rangeland, acres of nonfederal grazing lands, livestock animal units, acres of irrigated cropland, acres of American Indian tribal lands, and wind erosion above T. This analysis suggests that regions of the country with these types of characteristics are more likely to benefit from the current formula. On the other hand, a few factors, such as acres of forestlands, potential for pesticide and nitrogen leaching, and air quality nonattainment areas were not significantly related to the allocation, indicating that they had little or no impact on the formula.

Our factor analysis, which groups the data into a smaller number of categories that actually drive the formula, found that the largest grouping with the greatest amount of correlation, included acres of nonfederal grazing land, acres of fair and poor rangeland, livestock animal units, and wind erosion above T—all indicative of dryland agriculture and livestock feeding and ranching. These results correspond with those of our regression analysis and help to show how the current national allocation formula prioritizes money to states. A complete explanation of both analyses is included in appendix III.

Financial Assistance Formula Relies on Some Questionable and Outdated Data

Weaknesses in the financial assistance formula are compounded by NRCS's use of questionable and outdated data. Accurate data are key to ensuring that funds are distributed to states as intended. However, we identified several methodological weaknesses in the data sources: (1) data that were

[14]We discuss the importance of retrospective economic analysis and its usefulness in managing programs, in GAO, *Economic Performance: Highlights of a Workshop on Economic Performance Measures*, GAO Workshop, GAO-05-796SP, (Washington, D.C.: July 18, 2005).

used more than once in the formula, (2) data sources whose accuracy could not be verified, and (3) data that was not as recent as possible.

First, 5 of the 29 data sources behind the factors in the financial assistance formula were used more than once, potentially causing NRCS to overemphasize some environmental concerns at the expense of others. Specifically:

- NRCS uses the same data to estimate pesticide and nitrogen runoff and phosphorous runoff in its formula. According to NRCS, because data measuring the potential for phosphorous runoff were unavailable, it substituted data measuring the potential for pesticide and nitrogen runoff. The agency did so believing that similar characteristics cause both types of runoff. However, an NRCS official responsible for deriving the runoff and leaching indicators commented that the substitution of one type of runoff data for another was problematic because the mechanisms through which pesticides and nitrogen are transported off-site to cause environmental problems are different from those of phosphorous. A 2006 NRCS cropland report estimates that the intensity of nitrogen and phosphorous losses may differ geographically.[15] For example, nitrogen dissolved in surface water runoff in the upper Midwest accounts for 28 percent of the national total, while phosphorous dissolved in surface water runoff in the same region accounts for 45 percent of the national total. This difference in the effect of these two pollutants in the same region raises questions about the appropriateness of substituting one type of data for the other. Until adequate data are available for a given factor, it may not be appropriate to include that factor in the general financial assistance formula.

- NRCS's formula uses nonirrigated cropland, federal grazing land, nonfederal grazing land, and forestland once for estimating acreage and then again for estimating carbon sequestration.[16] According to NRCS,

[15]USDA's report, *Model Simulation of Soil Loss, Nutrient Loss, and Change in Soil Organic Carbon Associated with Crop Production*, USDA, Conservation Effects Assessment Project, June 2006, estimates nitrogen and phosphorous losses across the country on cropland.

[16]Carbon sequestration is the retention of carbon through physical or biological processes that prevent or delay its emission into the atmosphere. For example, conservation tillage leaves more crop residue on land and retains more carbon than many traditional cultivation practices. Sequestering carbon may help mitigate climate change by reducing the amount of carbon dioxide in the atmosphere.

the agency did not have good source data to measure potential areas where management practices could improve levels of carbon sequestration so it substituted these other data sources. While we could not fully assess the soundness of NRCS's estimate of carbon sequestration, some academic stakeholders we spoke with questioned whether NRCS had estimated carbon sequestration as effectively as possible and noted that alternate data sources were available. In discussing these alternate sources with NRCS, the EQIP Manager said the agency had not previously considered using these sources for the EQIP formula, but that they could prove relevant.

Using the same data for multiple factors may result in factors being indirectly weighted higher than intended. For example, the effective weight of the pesticide nitrogen runoff factor is 5.6 percent—the sum of the original pesticide nitrogen runoff weight (1.7 percent) and the phosphorous runoff weight (3.9 percent). Using data created for one factor for a second factor also makes the formula less transparent and potentially less reliable for allocating state funding.

Second, NRCS could not confirm the source of data used in 10 factors in the formula; as such, we could not determine the accuracy of the data, verify how NRCS generated the data, or fully understand the basis on which the agency allocates funding. Specifically, we could not confirm the source of data for acres of federal grazing land, livestock animal units, animal waste generation, acres of cropland eroding above T, acres of forestlands eroding above T, ratio of animal units to cropland, miles of impaired rivers and streams, ratio of commercial fertilizers to cropland, riparian areas, and coastal zone land.[17] For example, we could not verify how data for the livestock animal units and animal waste factors were generated, and NRCS said it had not retained documentation of how the data for these factors were calculated. As a result, it was uncertain whether NRCS had chosen the most appropriate data as its basis for allocating funds to states with pollution problems from livestock and animal waste or whether the data were accurately calculated. EQIP officials told us that, in most cases, the data sources had been chosen and incorporated into the

[17]For nine of these factors, NRCS provided documentation that allowed us to verify data for all but two states. However, this documentation did not provide sufficient evidence to allow us to verify the source of the data for these factors or understand how the data for these factors were estimated. For one factor, the documentation NRCS provided to corroborate the data used in its financial assistance formula did not match what was used in the formula.

formula before they were involved with EQIP and that documentation had not been kept to identify how data sources were used.

In addition, for one factor— the number of limited resource producers in a state—we found that the data did not measure what its factor name indicated. NRCS defines a limited resource producer as one who had, for the last 2 years, (1) farm sales not more than $100,000 and (2) a household income at or below the poverty level, or less than 50 percent of the county median household income.[18] However, the data NRCS uses in the general financial assistance formula only captures farms with low sales, which does not necessarily indicate whether producers on those farms have limited means. As a result, NRCS may not be directing funds to states having farmers with the most limited resources. A description of each factor in the fiscal year 2006 general financial assistance formula can be found in appendix II.

Third, NRCS does not use the most current data for six factors in the formula—livestock animal units, animal waste generation, number of limited resource producers, miles of impaired rivers and streams, ratio of livestock animal units to cropland, and ratio of commercial fertilizers to cropland.[19] According to NRCS, the source of data on the ratio of commercial fertilizers to cropland was a 1995 report by the Association of American Plant Food Control Officials; we found a 2005 version of the same report with more current data. In other cases, we identified more current, alternate sources of data. For example, the formula currently uses 1996 EPA data for its waste management capital cost factor but could use 2003 NRCS data that estimates waste management costs. [20] Not using

[18]Specifically, EQIP regulations (7 C.F.R. § 1466.3) define a limited resource producer as a person with (1) direct or indirect gross farm sales not more than $100,000 in each of the previous 2 years (to be adjusted for inflation) and (2) a total household income at or below the national poverty level for a family of four, or less than 50 percent of county median household income in each of the previous 2 years.

[19]In the case of the livestock animal units, animal waste generation, ratio of animal units to cropland, miles of impaired rivers and streams, and ratio of commercial fertilizers to cropland factors, where we were not able to verify the source of the data, we relied on EQIP program officials' statements about when data sources were created to determine if a more current source existed.

[20]NRCS's 2003 report, *Costs Associated with Development and Implementation of Comprehensive Nutrient Management Plans*, estimates the record-keeping, nutrient management, off-farm transport and land treatment costs associated with livestock farms. This data is available on a state-by-state basis.

recent data raises questions about whether the formula allocates funds to areas of the country that currently have the greatest environmental needs, because recent changes in a state's agricultural or environmental status may not be reflected. According to our analysis, by using more current data for the number of limited resource producers factor, one state would have received approximately $151,000 more in fiscal year 2006 (a 0.2 percent increase in that state's general financial assistance), and another state would have received approximately $138,000 less (a 1.3 percent decrease in that state's general financial assistance).[21] Because we were unable to determine how NRCS used the data for developing the remaining five factors, we could not determine what impact using more current data for those factors would have on financial assistance provided to states. According to NRCS, the alternate sources we identified appeared to be acceptable for use in the formula, and the agency is in the process of updating the formula's livestock data.

In addition to these six factors, data used to measure acres of riparian areas, fair and poor rangeland, and forestland eroding above T are about 20 years old and will likely become more inappropriate over time.

When we brought our concerns to NRCS's attention, officials agreed that the formula, including weights and data sources, needed to be reexamined. NRCS subsequently announced plans to issue a request for proposal soliciting comments and suggested revisions to NRCS's formulas for allocating conservation funds, including the EQIP financial assistance formula. In addition, according to NRCS's EQIP Manager, the agency is in the process of consolidating the data used in the financial assistance formulas for its conservation programs into a single database. As a part of this process, the agency plans to review its data sources for the formula factors and update them with more relevant and current data when possible.

[21]As noted above, the data NRCS uses for the limited resource producers factor has shortcomings. For purposes of demonstrating how changes over time could affect the distribution of general financial assistance, we used the same data NRCS used in its formula—farms with low sales.

NRCS Has Begun to Develop More Outcome-Oriented Performance Measures

NRCS has recently begun to develop program-specific, long-term measures to monitor EQIP's outcomes. In 2000, we reported that performance measures tied to outcomes would better communicate the results NRCS intended its conservation programs to achieve.[22] As part of its 2005 strategic planning effort, NRCS developed outcome-based, long-term measures to assess changes to the environment resulting from the installation of EQIP conservation practices.[23] These measures include such things as reduced sediment delivery from farms, improved soil condition on working cropland, and increased water conservation. Previously, in 2002, NRCS established annual measures that primarily assess program outputs—the number and type of conservation practices installed. Table 3 outlines NRCS's seven annual performance measures for fiscal year 2006, and table 4 describes its seven long-term EQIP performance measures approved in 2005.

Table 3: EQIP Annual Performance Measures, Fiscal Year 2006

Performance measure	Measure unit	Progress as of September 1, 2006	Fiscal year target as of September 1, 2006[a]
Comprehensive nutrient management plans applied	Number of plans	2,189	2,488
Comprehensive nutrient management plans written	Number of plans	2,231	2,435
Grazing land with conservation practices to protect the resource base	Acres	11,640,329	10,454,337
Improved irrigation efficiency	Acre-feet	641,158[b]	543,204[c]

[22]GAO, *Natural Resources Conservation Service: Additional Actions Needed to Strengthen Program and Financial Accountability*, GAO/RCED-00-83 (Washington, D.C.: Apr. 7, 2000).

[23]According to the Director of NRCS's Strategic Planning and Performance Division, NRCS has had program-neutral, outcome-based measures in place since 1997 to which EQIP was expected to contribute.

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Performance measure	Measure unit	Progress as of September 1, 2006	Fiscal year target as of September 1, 2006[a]
Nonfederal land managed to protect species with declining populations	Acres	1,163,850	381,124
Reduction of cropland soils damaged by erosion	Acres	1,345,101	1,360,622
Soil erosion reduced	Tons	16,230,336	9,912,788

Source: NRCS.

[a]According to NRCS, performance targets may change as additional funds are provided to the states and as states return unused funds to headquarters.

[b]This figure represents combined progress for EQIP, Ground and Surface Water Conservation, and Klamath Basin.

[c]This figure represents a combined target for EQIP, Ground and Surface Water Conservation, and Klamath Basin.

Table 4: EQIP Long-term Measures

Performance measure	Measure unit	Baseline year	Proposed target
Improve soil condition on working cropland	Millions of acres moved to a soil conditioning index level > than 0.[a]	.5 in 2005	2.7 by 2010
Reduce potential sediment delivery from agricultural operations	Million tons per year	2.4 in 2004	18.5 by 2010
Reduce potential nitrogen delivery from agriculture	Tons	18,200 in 2005	100,000 by 2010
Reduce potential phosphorus delivery from agriculture	Tons	2,700 in 2005	14,000 by 2010
Increase water conservation	Acre-feet	600,000 in 2005	4,200,000 by 2010
Improve grassland condition, health, and productivity	Million acres	10.3 in 2005	52 by 2010
Improve the quality of habitat for at-risk species	Million acres	.45 million in 2005	2.4 by 2010

Source: NRCS.

[a]The National Resources Inventory (NRI) includes data on soil type, soil characteristics, and soil interpretations, in addition to historical information on land use, management practices, and erosion. These data, along with historical climate data, are being used to assess soil quality by deriving a Soil Conditioning Index value for each NRI sample site. This index quantifies the effects of cropping sequences, tillage, and other management inputs on soil organic matter content, which serves as an indicator of soil quality.

According to NRCS, it has developed baselines for its long-term, outcome-based performance measures and plans to assess and report on them once computer models and other data collection methods that estimate environmental change are completed. The Director of the NRCS Strategic Planning and Performance Division said NRCS expects to assess and report on the status of all measures by 2010 but will be able to assess the results of some measures, such as improved soil condition on working land, sooner. In the meantime, the agency will continue to utilize its existing annual measures to assess performance. The Director of NRCS's Strategic Planning and Performance Division acknowledged that the long-term measures were not as comprehensive as needed but represented measures NRCS could reasonably assess using modeling and data collection methods that would soon become available. NRCS plans to continue to improve its performance measures going forward.

Although we did not assess the comprehensiveness of the EQIP performance measures, the additional information they provide about the results of EQIP outcomes should allow NRCS to better gauge program performance. Such information could also help the agency refine its process for allocating funds to the states via its financial assistance formula by directing funds toward practices that address unrealized performance measures and areas of the country that need the most improvement. The Chief of NRCS's Environmental Improvement Programs Branch agreed that information about program performance might eventually be linked back to the EQIP funding allocation process. However, the agency does not yet have plans to do so.

Conclusions

As a key NRCS conservation program with over $1 billion in annual funding, EQIP was designed to help producers mitigate the potentially negative environmental impacts of agricultural production. However, the program may not be fully optimizing the environmental benefits resulting from practices installed using EQIP dollars because of weaknesses in NRCS's process for allocating funds to the states. Moreover, outdated and duplicate formula data sources may further compromise EQIP's effectiveness in allocating funds. Currently, it is not clear that factors, weights, and data sources in the general financial assistance formula help the agency direct funding to the areas of the nation with the greatest environmental threats arising from agricultural production. NRCS has an opportunity to address this issue as it moves forward on its plans to reexamine its conservation funding formulas. Furthermore, the agency may be able to use information gathered from the results of its outcome-based

performance measures to refine the financial assistance formula, making it easier for NRCS to direct EQIP funds at the most pressing environmental problems related to agriculture production.

Recommendations for Executive Action

To achieve EQIP's purpose of optimizing environmental benefits, we recommend that the Secretary of Agriculture direct the Chief of the Natural Resources Conservation Service to take the following two actions:

- ensure that the rationale for the factors and weights used in the general financial assistance formula are documented and linked to program priorities, and data sources used in the formula are accurate and current; and

- continue to analyze current and newly developed long-term performance measures for the EQIP program and use this information to make any further revisions to the financial assistance formula to ensure funds are directed to areas of highest priority.

Agency Comments and Our Evaluation

We provided USDA with a draft of this report for review and comment. USDA agreed that the EQIP allocation formula needs review. USDA did not agree with our assessment that NRCS's funding process lacks a clear link to the program's purpose of optimizing environmental benefits. The agency stated that its use of factors related to the natural resource base and condition of those resources shows the general financial assistance formula is tied to the program's purpose of optimizing environmental benefits. USDA stated that, while some formula data sources and weights will be updated, the types of factors used would be needed in any process that attempts to inventory and optimize environmental benefits. While this may in fact be the case, USDA needs to document this connection—that is, why factors were chosen and weights assigned. USDA could make the connection between the formula and the program's purpose of optimizing environmental benefits more evident if it provided additional information describing its reasons for including or excluding factors in the formula and its rationale for assigning and modifying weights.

Appendix VII presents USDA's comments.

We are sending copies of this report to interested congressional committees, the Secretary of Agriculture, the Director of the Office of Management and Budget, and other interested parties. We also will make copies available to others upon request. In addition, the report will be available at no charge on the GAO Web site at http://www.gao.gov .

If you or your staff have any questions about this report, please contact me at (202) 512-3841 or bertonid@gao.gov. Contact points for our Offices of Congressional Relations and of Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix VIII.

Sincerely yours,

Daniel Bertoni
Acting Director, Natural Resources
and Environment

Objectives, Scope, and Methodology

At the request of the Ranking Democratic Member, Senate Committee on Agriculture, Nutrition, and Forestry, we reviewed the extent to which (1) the U.S. Department of Agriculture's (USDA) process for allocating Environmental Quality Incentives Program (EQIP) funds to states is consistent with the program's purpose of optimizing environmental benefits and (2) USDA has developed measures to monitor program performance.

To review the Natural Resources Conservation Service's (NRCS) process for allocating EQIP funding to the states, we examined EQIP funding documents and spoke with NRCS officials from the Financial Assistance Program Division, Budget Planning and Analysis Division, and Financial Management Division. Our analysis considered each of the different categories of EQIP funding, including EQIP general financial assistance, EQIP technical assistance, regional equity funds, performance bonuses, Conservation Innovation Grants, Colorado Salinity funds, Ground and Surface Water Conservation funds, and Klamath Basin funds. We gathered comments from stakeholders about the strengths and weaknesses of NRCS's EQIP funding approach. We selected stakeholders from environmental and farm organizations to get a broad set of views on the effectiveness of the formula in allocating funds. Specifically, we spoke with representatives from environmental organizations, including Environmental Defense, the National Association of Conservation Districts, the Soil and Water Conservation Society, and the Sustainable Agriculture Coalition, as well as farm organizations, including the American Farm Bureau and the National Pork Producers Council. We also discussed the EQIP funding allocation process with selected participants on state technical committees—the Iowa Department of Natural Resources, Iowa Farm Bureau, and Nebraska Department of Environmental Quality; academic stakeholders; and former NRCS employees who participated in the development of the original formula.[1] We examined the factors and weights in the financial assistance formula and discussed their purpose with EQIP program officials. We performed statistical analysis of the financial assistance formula to determine what impact the different factors had on overall funding. A discussion of the analysis we performed can be found in appendix III. We searched for information about the source of data for each factor in the formula in order to formulate an understanding of what each factor measured and verify the

[1]State Technical Committees offer advice to NRCS state officials on establishing EQIP activities at the state level.

accuracy of the data being used by NRCS. NRCS did not retain documentation of the source data for 10 factors and, as a result, we were unable to verify all data used in the financial assistance formula. To estimate the number of factors using outdated data, we searched for more updated versions of the same data sources NRCS said it used in its formula. We did not include more updated, but different, sources of data in our count.

To understand Congress's and NRCS's goals for EQIP, we reviewed the Federal Agriculture Improvement and Reform Act of 1996, Farm Security and Rural Investment Act of 2002, associated regulations, and related appropriations laws. We reviewed program documentation describing the purpose and priorities of EQIP and discussed the documentation with EQIP officials. To understand agency conservation priorities, we analyzed a 2005 database of conservation practices funded using EQIP, Ground and Surface Water Conservation, and Klamath Basin funds.

To determine how the factors and weights in the formula aligned with resource concerns across the nation, we conducted research on the impact agricultural production has on the environment. We spoke with NRCS officials from selected states—Iowa, Maryland, Mississippi, Missouri, Montana, Nebraska, New Mexico, Rhode Island, and Texas—to better understand resource concerns important to their state and how they used funds received from headquarters to address those concerns. We also spoke with officials from three county offices within these states. This geographically diverse group included states that received varying amounts of EQIP funding and engaged in a range of types of agricultural production.

To review what measures are in place to monitor EQIP program performance, we spoke with representatives from the NRCS teams responsible for strategic planning and oversight activities—the Operations Management and Oversight Division, Oversight and Evaluation staff, and Strategic and Performance Planning Division—and representatives from the Financial Assistance Program Division. We examined agency strategic planning and performance documents. We reviewed documentation of agency and EQIP goals and performance measures and reviewed the Web-based NRCS Performance Results System.[2] We also spoke with representatives from NRCS and nongovernmental organizations working

[2]NRCS's Performance Results System can be found at http://ias.sc.egov.usda.gov/prshome/default.html.

on the Conservation Effects Assessment Project and reviewed related documentation to determine how that initiative might influence the development of future EQIP goals. Our analysis did not include an independent verification of NRCS's compliance with internal controls.[3]

We performed our work between December 2005 and August 2006 in accordance with generally accepted government auditing standards.

[3]The following OIG and GAO reports have recently addressed the issue of internal control at NRCS: *Audit Report. Natural Resources Conservation Service Application Controls–Program Contracts System (ProTracts).* Report No. 10501-5-FM. (Washington, D.C.: July 2006); GAO, *Conservation Security Program: Despite Cost Controls, Improved USDA Management Is Needed to Ensure Proper Payments and Reduce Duplication with Other Programs*, GAO-06-312 (Washington, D.C.: Apr. 28, 2006); *Audit Report. Natural Resources Conservation Service. Environmental Quality Incentives Program.* Report No. 10099-18-KC. (Washington, D.C.: February 2005); and *Audit Report. Natural Resources Conservation Service. Environmental Quality Incentives Program. Cost Share Practice Approvals and Specifications in Nebraska.* Report No. 10005-1-KC. (Mission, Kans.: November 2002).

EQIP 2006 Funding Allocation Formulas

Tables 5, 6, 7, and 8, respectively, describe the formulas for allocating general financial assistance, Ground and Surface Water Conservation funds, performance bonuses, and Klamath Basin funds. In the case of the general financial assistance formula, we have identified the source of data for each factor and described what each factor measures.

Table 5: Factors, Data Sources, and Weights in the EQIP General Financial Assistance Formula for Allocating Funding to the States in Fiscal Year 2006

Factor	Source	Description	Weight
Acres of nonirrigated cropland	1997 National Resources Inventory (Revised December 2000)	Nonirrigated cultivated and noncultivated cropland acres	3.2%
Acres of irrigated cropland	1997 National Resources Inventory (Revised December 2000)	Irrigated cultivated and noncultivated cropland acres	4.3
Acres of federal grazing lands	[a]	[b]	0.5
Acres of nonfederal grazing lands	1997 National Resources Inventory (Revised December 2000)	Nonfederal, rural acres of pastureland, rangeland, and grazed forestland	4.3
Acres of forestlands	1997 National Resources Inventory (Revised December 2000)	Nonfederal, rural acres of forestland	1.1
Acres of specialty cropland	1997 National Resources Inventory (Revised December 2000)	Acres of land used as vineyards or to grow fruits, nuts, berries, bush fruit, or other specialty crops	3.2
Acres of wetlands and at-risk species habitat	1997 National Resources Inventory (Revised December 2000)	Acres of wetlands and deepwater habitats on water areas and nonfederal land	4.6
Acres of bodies of water	1997 National Resources Inventory (Revised December 2000)	Surface area (in acres) of water areas	3.2
Livestock animal units	1997 NRCS calculation based on data gathered prior to 1997 (exact year unknown)[c]	[b]	5.8
Animal waste generation	NRCS calculation based on 1987 Census of Agriculture and other data[c]	[b]	5.8
Waste management capital cost	1996 Environmental Protection Agency Clean Water Needs Survey Report to Congress	Modeled estimates of state needs for controlling nonpoint source pollution from confined animal facilities with fewer than 1,000 animal units	3.5
Acres of American Indian tribal lands	1997 Bureau of Indian Affairs data	Acres of American Indian reservations and Tribal Trust Land	3.3
Number of limited resource producers	1997 Census of Agriculture	Number of farms with sales under $100,000	5.0
Acres of grazing land lost to conversion	1997 National Resources Inventory (Revised December 2000)	Acres of grazing and pastureland converted to another form of land or development between 1982 and 1997	0.8

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Factor	Source	Description	Weight
Air quality nonattainment areas	NRCS analysis of 2005 Environmental Protection Agency air quality data	Measure of air quality nonattainment based on the percent of a state affected by certain air quality pollutants and the number of air quality standards not met by that state	1.4
Acres of pastureland needing treatment	1992 National Resources Inventory	Acres of pastureland needing conservation treatment	5.5
Acres of cropland eroding above T	1992 National Resources Inventory[c]	[d]	6.2
Acres of fair and poor rangeland	1987 National Resources Inventory	Acres of rangeland in fair and poor condition	6.2
Acres of forestlands eroding above T	1987 National Resources Inventory[e]	[f]	1.4
Acres of cropland and pastureland soils affected by saline and/or sodic conditions	1997 National Resources Inventory (Revised December 2000)	Acres of cultivated and noncultivated cropland and pastureland with the presence of salts	2.6
Miles of impaired rivers and streams	Environmental Protection Agency 1994 National Water Quality Inventory[c]	[b]	3.6
Potential for pesticide and nitrogen leaching	1997 NRCS analysis[g]	NRCS formula based on data about land vulnerability to manure nitrogen, commercial nitrogen, and pesticide leaching	1.3
Potential for pesticide and nitrogen runoff	1997 NRCS analysis[g]	NRCS formula based on data about land vulnerability to manure nitrogen, commercial nitrogen, and pesticide runoff	1.7
Ratio of livestock animal units to cropland	[a]	[b]	1.7
Number of concentrated animal feeding operations/animal feeding operations	2003 NRCS report based on 1997 Census of Agriculture data[h]	Number of farms needing a comprehensive nutrient management plan	2.8
Ratio of commercial fertilizers to cropland	NRCS calculation based on 1995 data from the Association of American Plant Food Control Officials and 1997 NRI cropland data[c]	[b]	0.9
Wind erosion above T	1997 National Resources Inventory (Revised December 2000)	Cultivated and noncultivated cropland with a 4-year average rate of estimated soil loss due to wind erosion greater than T—a tolerable rate of erosion above which soil productivity is believed to decrease	4.2
Phosphorous runoff potential	1997 NRCS analysis[g]	Same data used for factor measuring potential for pesticide and nitrogen runoff	3.9
Riparian areas	1982 National Resources Inventory[c]	[i]	0.8

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Factor	Source	Description	Weight
Carbon sequestration	1997 National Resources Inventory (Revised December 2000) and unknown data source	Sum of data from other factors in the financial assistance formula—nonirrigated cropland, federal grazing lands, nonfederal grazing lands and forestlands	3.6
Coastal zone land	NRCS calculation based on 1992 National Oceanic and Atmospheric Administration and unknown data[c]	[j]	3.6%

Sources: GAO analysis of NRCS and USDA data.

Note: We used NRCS's own terminology for the factor names in this chart. In some instances, names do not precisely capture what is being measured.

[a]We were unable to verify the source of data for this factor.

[b]Because we could not verify certain data sources, we were unable to provide an accurate description of what each factor measured. Blank cells indicate that we were unable to accurately describe what the factor measured.

[c]Data source as reported by NRCS. We were unable to verify the source of data for this factor.

[d]According to an NRI official, cropland eroding above T could have been estimated in one of two ways—(1) acres of cropland where the total wind, sheet and rill erosion rates exceeded T or (2) acres of cropland where either wind erosion, sheet and rill erosion, or both, exceeded T. We were not able to confirm how the data was estimated.

[e]NRCS could not confirm the source or date of this data. The National Resources Inventory believed this data was from work NRI performed in 1987.

[f]According to an NRI official, this factor measures acres of nonfederal, rural forestland with estimated average annual sheet and rill erosion above T. We were not able to obtain documentation to confirm this definition.

[g]"Potential Priority Watersheds for Protection of Water Quality from Nonpoint Sources Related to Agriculture." Poster Presentation at the 52nd Annual SWCS Conference Toronto, Ontario, Canada, July 22-25, 1997 (Revised October 7, 1997).

[h]*Costs Associated with Development and Implementation of Comprehensive Nutrient Management Plans Part I—Nutrient Management, Land Treatment, Manure and Wastewater Handling and Storage, and Recordkeeping* (NRCS, June 2003).

[i]According to NRCS, the definition for riparian areas in the 1982 National Resources Inventory was acres of riparian areas—the banks, shorelines, or edges of the rising ground bordering a natural or manmade watercourse or water area (riparian areas are not limited to natural areas).

[j]According to NRCS, this factor considers data on square miles of coastlines.

Table 6: Fiscal Year 2006 Formula for Allocating Ground and Surface Water Conservation Financial Assistance

Targeted area	Allocation methodology	Weight
High Plains Aquifer states—Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Wyoming	Percentage of state's acreage in the High Plains Aquifer	40.6%
Western drought states—Arizona, California, Idaho, Montana, Nevada, North Dakota, Oregon, Utah, and Washington	Amount of irrigated acreage in each state	41.5%
Additional states with agricultural water needs—Alabama, Arkansas, Delaware, Florida, Georgia, Hawaii, Iowa, Louisiana, Maine, Minnesota, Mississippi, Missouri, North Carolina, Puerto Rico, Wisconsin	Proportional comparison of agriculture to nonagricultural use of water	17.9%

Source: NRCS.

Table 7: Factors Used in the Fiscal Year 2006 Formula for Allocating EQIP Performance Bonuses

Factor	Description	Weight
Ratio of technical assistance obligations to total obligations	Ratio of obligated EQIP funds used for technical assistance in fiscal year 2005 to total obligated funds	25%
Livestock-related contracts	Ratio between the number of EQIP contracts issued for Comprehensive Nutrient Management Plans to the number of farms needing such plans[a]	15
Cost-share obligations versus payments	Ratio of cost-share dollars obligated to cost-share dollars paid in fiscal years 2004 and 2005	15
Technical service provider obligations and disbursements	Ratio of disbursements to obligations in fiscal years 2004 and 2005 to technical service providers—contractors that help producers install practices	15
Weighted cost-share percentage	Average cost-share rate by state, excluding limited resource farmer cost-share and incentive payments	10
Limited resource farmer	Percentage of total EQIP contracts entered into with limited resource farmers	10
Program national priorities	Ratio between acres treated with conservation practices that address the national priorities to the total agricultural base	10%

Source: NRCS.

[a]Comprehensive nutrient management plans are conservation plans unique to livestock operations. These plans document practices and strategies adopted by livestock operations to address natural resource concerns related to manure and organic by-products and their potential impacts on water quality.

Table 8: Fiscal Year 2006 Formula for Allocating Klamath Basin Program Financial Assistance

State	Weight
California	50%
Oregon	50%

Source: NRCS.

Statistical Techniques to Determine Influential Factors in the 2006 EQIP Financial Allocation Formula

Using statistical techniques—that is, principal components regression and factor analysis—we analyzed the Environmental Quality Incentives Program (EQIP) formula used to allocate fiscal year 2006 financial assistance to the states to identify the environmental factors that most influenced the allocations. Sixty-five percent of the total EQIP funds for 2006 were based on the allocation formula for financial assistance.

Principal Components Regression

In order to determine the relationships between the allocation and the environmental factors (variables), we typically would apply regression techniques to a model, expressed as

$$(1)\ A_i = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \ldots + \beta_j x_{ji} + \varepsilon_i \qquad (i = 1,\ldots, 48)$$

In equation (1), the dependent variable is the funding allocation for state i, the x's are the j factors in the allocation formula, $\beta_0, \beta_1,\ldots,\beta_j$ are the regression coefficients, and ε_i is the model error for the i^{th} state.

When we used this model, however, standard regression techniques were not possible because many of the environmental factors used in the allocation formula were highly collinear.[1] Collinearity occurs when variables are so highly correlated that it is difficult to distinguish their independent influences on the dependent variable—in this case, state allocation funding. In a regression analysis, highly correlated independent variables cause the following effects: (1) regression coefficients change, depending on which variables are included or excluded in the model, (2) standard errors are large, (3) regression coefficients are large with random signs, and (4) achieving statistical significance of the collinear parameters is difficult. Moreover, multicollinearity poses a problem if the purpose of the model is to estimate, or explain, rather than predict, the individual contributions of variables. Following Fekedulegn et al., (2002), Norton

[1]We used both the variance inflation factor (VIF), as well as inspection of the eigenvalues to determine the extent of multicollinearity in the model. Many of the eigenvalues were close to zero, indicating a serious problem with multicollinearity.

(1984), and others, we used principal components regression analysis since this technique is recommended when there is multicollinearity in the data.[2]

Before running the regression analysis, we performed the principal components analysis.[3] This procedure generates a set of latent variables, called principal components—uncorrelated linear transformations of the original variables.[4] At this stage, even though the new variables are not collinear, the same magnitude of variance is retained. Therefore, the elimination of small principal components reduces the total variance and substantially improves the diagnostic capability of the model. In order to eliminate these small principal components, various selection procedures are used. Following Fekedulegn (2002), we chose the cumulative eigenvalue product rule, which keeps the first principal components whose combined product is greater than 1.00 (Guiot et al., 1982).[5] The principal components themselves are expressed as

(2) $\mathbf{Z} = \mathbf{X}^*\mathbf{V}$.

[2]Fekedulegn, B. Desta, J.J. Colbert, R.R. Hicks, Jr., and Michael E. Schuckers, "Coping with Multicollinearity: An Example on Application of Principal Components Regression in Dendroecology," Forest Service, Northeastern Research Station, Research Paper NE-721, USDA, 2002; Norton, D.A., "Tree Growth—Climate Relationships in Subalpine Nothofagus Forests, South Island, New Zealand," *New Zealand Journal of Botany*, 1984, vol. 22: 471-481.

[3]In order to perform the principal components analysis, we used the SAS PRINCOMP procedure.

[4]The vectors are said to be uncorrelated or orthogonal (perpendicular) to each other when they yield a zero valued scalar product.

[5]Guiot, J., Berger, A.L., Munaut, A.V., 1982. "Response Functions," In: Hughes, M.K., Kelly, P.M., Pilcher, J.R., LaMarche, V.C., eds. *Climate from Tree Rings*. Cambridge, UK: Cambridge University Press: 38-45.

In equation (2), **Z** is an (i x j) matrix of principal components, **X** is an (i x j) matrix of standardized environmental factors, and **V** is a (j x j) matrix of eigenvectors.[6,7]

After the principal components analysis and the elimination of smaller principal components as described above, we used the data in a cross-sectional multivariate regression expressed as

(3) $\mathbf{A} = \beta_0 \mathbf{1} + \mathbf{Z}\alpha + \varepsilon$.

In equation (3), ***A*** is an (i x 1) vector for the allocation of funding for the states (the dependent variable in the regression), $\beta_0\mathbf{1}$ is an (i x 1) vector of the intercept terms, **Z** is an (i x j) matrix of principal components, and α is a (j x 1) vector of new coefficients of the principal components. However, this procedure will usually leave some principal components that are not statistically significant. Therefore, to further eliminate the nonsignificant principal components, we used the SAS stepwise regression procedure.[8] Specifically, we eliminated "r" principal components in the analysis, which consisted of the (1) number eliminated using the eigenvalue product rule and (2) number eliminated from the stepwise regression. We were then left with (j – r) principal components estimators or coefficients and the reduced form in equation 3 becomes

(4) $A = b_0 1 + \mathbf{Z}_{j-r}\hat{\alpha}_{j-r} + \varepsilon$.

In equation (4), α is the vector of coefficients associated with the reduced set of (j–r) principal components and **Z** is an (i x (j–r)) matrix of principal components. With the r components eliminated, the principal components estimators—in terms of the standardized environmental factors of the

[6]**V** is a (j x j) matrix of "orthonormal" eigenvectors, meaning that it has the property that its transpose and its inverse matrix are equal. Equivalently, any pair from the set of column vectors, or row vectors, of the matrix are perpendicular or orthogonal (have a scalar product of zero), while any individual vector from the set has a norm of one (scalar product with itself of one).

[7]An eigenvector of a transformation is a vector whose direction is unchanged by that transformation. The factor by which the magnitude is scaled is called the eigenvalues of that vector.

[8]The stepwise regression procedure examines the impact of each variable to the model on a step-by-step basis. A variable that cannot contribute much to the variance explained is eliminated.

allocation model—are obtained by multiplying the new vector of coefficients by the associated vectors in the matrix of eigenvectors:

(5) $\mathbf{b}^{s}_{pc} = \mathbf{V}_{j \times (j-r)}\, \alpha_{(j-r) \times 1}$.

In equation (5), $\mathbf{b}^{s}_{pc}$ (subscript pc stands for principal components) is the vector of j standardized principal component estimators of the regression coefficients of the environmental factors, **V** is the (j x (j - r)) matrix of eigenvectors, and α is the reduced vector of ((j – r) x 1) estimated coefficients as in equation 4. Once we have the standardized coefficients of the principal components estimators of the factors, we can transform them back into the coefficients of the original environmental factors. For the standardized estimators, the method for this transformation is expressed as

(6) $$b_{j,pc} = \frac{b^{s}_{j,pc}}{S_{X_j}}$$

In equation (6), S_{x_j} is the standard deviation of the original j^{th} environmental factor, x_j, $b^{s}_{j,pc}$ is the j^{th} standardized estimator, and $b_{j,pc}$ is the coefficient of the original environmental factor.

While we can obtain the regression coefficients of the original environmental factors (the $b_{j,pc}$'s) that have been corrected for multicollinearity, we cannot directly compare them because most have different units. For instance, some environmental and resource factors used in the formula are measured in acres, while others may be measured in terms of animal units. In other words, the largest coefficient may not be the most influential in the regression. Therefore, when comparing the relative importance of the factors (variables) in the regression, we mainly

discuss the standardized estimators of the environmental factors used in the allocation formula.[9]

Data Used

For the 48 contiguous states, we used a cross-section of data for the dependent variable—the allocation variable—and the independent variables—the environmental variables (factors). We could not incorporate Alaska or Hawaii because we lacked complete data. We excluded two factors—independent variables—from the regression analysis because they were linear combinations of factors already included in the data. For instance, we could not include the carbon sequestration factor because it is the sum of four factors already included in the formula allocation model: acres of nonirrigated cropland, forestland, federal grazing land, and nonfederal grazing land. We also excluded the factor for pesticide and nitrogen runoff because it contains the same data as the phosphorous runoff potential factor. Although the U.S. Department of Agriculture (USDA) weights these factors differently, they are still linear combinations and, for regression analysis, must be excluded. In all, we ran the regression using the 2006 state allocations for the 48 states as our dependent variable and the 29 environmental and resource factors in the formula for our independent variables.

Results

After reducing the components from the eigenvalues product rule and the stepwise regression, we were left with 13 principal components from the original 29. We then transformed the parameter estimates of the stepwise regression, $\hat{\alpha}$, back into the coefficients of the standardized principal components of the environmental factors, the $\mathbf{b}^{s}_{pc}$. The results for these standardized coefficients—$\mathbf{b}^{s}_{pc}$, the t-values, and the probability values of t—sorted by the size of the standardized coefficient are shown in table 9.

[9]To test for the statistical significance of the principal components estimators, it has been shown that the proper test statistic to use is a t-test with (n – k – 1) degrees of freedom. Therefore, for a two-sided test: $H_0: \beta_j^s = 0$ vs. $H_a: \beta_j^s \neq 0$, with significance level α, the null hypothesis, H_0, should be rejected if the test statistic is greater than or equal to the critical value, ($t_{\alpha/2, n-k-1}$). The actual test statistic, where $b^s_{j,pc}$ is the standardized principal component estimator of β_j^s is $t = b^s_{j,pc} / s.e.(b^s_{j,pc})$ where $s.e.(b_{j,pc})$ is the standard error of the coefficients of original environmental factors. It is estimated by dividing the standard error of the standardized principal component estimator, $b^s_{j,pc}$, by the standard deviation of the corresponding environmental factor. Mansfield et al. (1977) and Gunst and Mason (1980).

Specifically, a standardized coefficient of a factor measures the expected change in the dependent variable for a one unit change in the standardized independent variable, in this case the i^{th} factor, all other things being equal. Those variables that had the largest standardized coefficient as well as being highly statistically significant were acres of fair and poor rangeland, acres of nonfederal grazing land, acres of irrigated cropland, acres of American Indian tribal lands, wind erosion above T, and livestock animal units. As table 9 shows, as one would expect with a formula, most of the factors in the regression were highly significant and positively related to the allocation, except the four factors, acres of forestlands, potential for pesticide and nitrogen leaching, air quality nonattainment areas, and acres of federal grazing lands.

Table 9: Standardized Principal Components Estimators of the Original Variables and Statistical Significance

Factor	Standardized coefficient	t-value	p-value
Acres of fair and poor rangeland	1399095	35.322	<0.0001
Acres of nonfederal grazing lands	1389052	35.7784	<0.0001
Acres of irrigated cropland	1372591	13.448	<0.0001
Acres of American Indian tribal lands	1313695	13.2325	<0.0001
Wind erosion above T	1210688	18.4507	<0.0001
Livestock animal units	1197842	37.3831	<0.0001
Riparian areas	935709	12.5955	<0.0001
Number of limited resource producers	776918	17.9933	<0.0001
Acres of cropland eroding above T	748625	11.1347	<0.0001
Acres of bodies of water	699697	8.91583	<0.0001
Acres of cropland and pastureland soils affected by saline and/or sodic conditions	654109	6.14821	<0.0001
Acres of specialty cropland	648891	10.1944	<0.0001
Acres of pastureland needing treatment	625264	11.5436	<0.0001
Animal waste generation	537929	6.19323	<0.0001
Acres of wetlands and at-risk species habitat	528679	10.9819	<0.0001
Waste management capital cost	504716	7.58475	<0.0001
Coastal zone land	501769	9.1963	<0.0001
Acres of grazing land lost to conversion	449376	6.32035	<0.0001
Miles of impaired rivers and streams	446096	3.99622	0.0008
Ratio of commercial fertilizers to cropland	409840	4.10749	0.0007
Acres of nonirrigated cropland	403724	7.66134	<0.0001

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Factor	Standardized coefficient	t-value	p-value
Acres of forestlands eroding above T	393498	5.97645	<0.0001
Phosphorous runoff potential	306870	5.30147	<0.0001
Number of concentrated animal feeding operations/animal feeding operations	251359	4.95367	0.0001
Ratio of livestock animal units to cropland	213299	2.08889	0.0512
Acres of forestlands	89181	1.19149	0.2489
Potential for pesticide and nitrogen leaching	45721	0.77	0.4513
Air quality nonattainment areas	-33022	-0.64754	0.5255
Acres of federal grazing lands	-280851	-2.53757	0.0206

Source: GAO analysis of USDA data.

Note: All variables above the bolded line are positive and statistically significant at the 0.05 percent level. Our analysis does not include an adjustment made to the variable "acres of American Indian tribal lands" affecting two states. We do not expect that this adjustment would have a material affect on the results.

Factor Analysis of EQIP Environmental Variables

We used the factor analysis technique to reduce the original set of variables (environmental factors) in the EQIP formula to a smaller set of underlying factors that actually drive the variables and the relationships among these variables.[10] Factor analysis has been used previously by researchers to identify, group, and interpret various environmental concerns, such as soil quality, that cannot be measured directly, but must be inferred by measuring other attributes that serve as indicators.[11] For this formula, the underlying factors should mimic, in some sense, the underlying environmental concerns, such as water quality and quantity, soil productivity, and wildlife habitat preservation.

[10]As in the regression analysis, we do not include the carbon sequestration variable or the pesticide and nitrogen runoff variable as these are linear combinations of other data in the allocation formula. Also, this analysis does not include an adjustment made in the data for the factor "acres of American Indian Tribal Lands" between two states. We do not expect that this adjustment would have a material affect on the results.

[11]Specifically, factor analysis was used in a study to identify and interpret soil quality factors at a regional level. Brejda, John J. and Thomas B. Moorman, "Identification and Interpretation of Regional Soil Quality Factors for the Central High Plains of the Midwestern USA," In: D.E. Stott, R.H. Mohtar, and G.C. Steinhardt (eds.), *Sustaining the Global Farm*, selected papers from the 10th International Soil Conservation Organization Meeting held May 24–29, 1999, Purdue University and USDA-ARS National Soil Erosion Research Laboratory.

Explanation of the Technique

Factor analysis is a technique used to explain the correlations between variables and to derive a new set of underlying variables, called "factors," that give a better understanding of the data being analyzed. Using this technique allows us to determine what smaller number of factors accounts for the correlation in the larger set of variables in the formula.

In factor analysis, each observed variable, x, can be expressed as a weighted composite of a set of underlying, latent variables (f's) such that

$$(7)\ x_i = a_{i1}f_1 + a_{i2}f_2 + \cdots + a_{ik}f_k + e_i.$$

In equation (7), the correlation between the observed variables, the x's, can be explained in terms of the underlying (latent) factors. These latent factors explain the common variance between the variables. For example, given a set of observed variables, factor analysis forms a set of factors that are as independent from each other as possible, while the observed variables within each factor are as highly correlated as possible.

To perform the factor analysis, we used the SAS PROC FACTOR procedure, choosing the principal factors method to extract the factors. One part of the analysis was to determine the number of factors to extract. Hypothetically, there can be one factor for every variable, but the goal is to reduce this number to a subset of factors that drive, or control, the values of the variables being measured. We postulated that the underlying factors should mimic, in some sense, the underlying environmental concerns, such as water quality and quantity, soil productivity, and wildlife habitat. However, since the data contain certain variables such as acres of nonirrigated cropland, acres of nonfederal grazing land, or acres of American Indian tribal lands, the latent factors may be different in character. To determine the number of factors, there are several computational methods and more subjective methods such as ease of interpretability of factors. We used both the ease of interpretability of the factors, as well as the "scree test."[12] As is typically done to achieve a more meaningful and interpretable solution, we applied a rotation technique to the initial factor pattern matrix.[13]

[12]A "scree test" is a graphic method for determining the number of factors. The eigenvalues are plotted in the sequence of the principal factors. The number of factors is chosen where the plot levels off to a linear decreasing pattern.

[13]In this case, we applied an orthogonal rotation to the initial factor pattern matrix.

Results

We used the rotated factor pattern matrix to interpret the meaning of the latent factors, which we identified through their correlations with the environmental factors (variables), as shown in table 10. The factor loadings that have an absolute value equal to or greater than 0.4 are shaded, and several variables are significantly correlated with more than one factor—called a "split loading."[14]

Table 10: Rotated Factor Pattern Matrix

	Latent factor			
Factor or variable from formula	**1**	**2**	**3**	**4**
Acres of nonfederal grazing land	0.95432	-0.14193	0.00329	0.10117
Acres of fair and poor rangeland	0.89044	-0.18858	0.04876	-0.03961
Livestock animal units	0.77845	0.51746	0.07331	0.19868
Wind erosion above T	0.76534	0.12833	0.11974	-0.29702
Acres of cropland eroding above T	0.69604	0.613	-0.01102	-0.21171
Riparian areas	0.68226	0.16742	0.37957	0.23914
Acres of grazing land lost to conversion	0.64431	0.26539	-0.0365	0.11935
Acres of irrigated cropland	0.61829	0.0418	0.14401	0.4548
Acres of pastureland needing treatment	0.60112	0.28467	0.24348	0.11009
Number of limited resource producers	0.59529	0.56896	0.23444	0.20013
Acres of federal grazing land	0.46349	-0.4339	-0.32474	0.01709
Acres of cropland and pastureland soils affected by saline and/or sodic conditions	0.39952	-0.17105	-0.18815	0.39389
Number of concentrated animal feeding operations/animal feeding operations	0.05818	0.87513	-0.03339	-0.0465
Phosphorous runoff potential	0.12202	0.86976	0.28758	0.13109
Waste management capital cost	0.1018	0.76694	0.04769	0.07004
Acres of nonirrigated cropland	0.46277	0.71639	-0.15479	-0.23632
Potential for pesticide and nitrogen leaching	0.01166	0.69366	0.46219	0.29581
Animal waste generation	0.2898	0.57515	0.26865	0.19698
Acres of American Indian tribal lands	0.24861	-0.37768	-0.26536	0.01991
Ratio of livestock animal units to cropland	0.08217	-0.47811	-0.05783	0.29948
Acres of wetlands and at-risk species habitat	0.14074	0.18228	0.86993	-0.1914

[14]In factor analysis terminology, a "loading" is the correlation between a variable and a factor. A correlation above 0.40 is considered a statistically significant correlation.

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	Latent factor			
Factor or variable from formula	**1**	**2**	**3**	**4**
Acres of bodies of water	0.35908	0.10564	0.81371	-0.01889
Coastal zone land	0.1042	-0.05594	0.79583	0.29895
Acres of forestlands	0.13012	0.24312	0.69724	0.20541
Acres of specialty cropland	0.09679	-0.10928	0.30919	0.78195
Acres of forestlands eroding above T	0.15413	-0.00078	-0.04538	0.77575
Miles of impaired rivers and streams	0.20763	0.12325	0.1149	0.60384
Ratio of commercial fertilizer to cropland	-0.15704	0.21558	0.05047	0.52823
Air quality nonattainment areas	-0.19264	-0.2472	-0.00932	0.32038

Source: GAO analysis of USDA data.

Note: Variable loadings with a significant correlation are shaded.

The factor analysis technique also calculates the amount of common variance explained by each latent factor. For these data, the variances are: factor 1— 6.44, factor 2—5.49, factor 3—3.56, and factor 4—3.00, accounting for about 71 percent of the common variance in the data.

Overall, the four factors (1) all relate to environmental concerns, as well as agricultural resources, and (2) each latent factor contributes a decreasing amount of common variance to the total variation among all of the variables. We interpreted the EQIP data that went into the factor analysis to represent (1) dryland agriculture and cattle feeding, (2) water quality concerns relating to concentrated livestock feeding operations and nonirrigated cropland, (3) wildlife habitat preservation, and (4) specialty crops/intensive agriculture and water quality/quantity concerns. Specifics of the factor analysis follow:

Factor 1: This factor contributes the most variation to the factor analysis and seems to be associated with dryland agriculture and cattle grazing and feeding. The variables—acres of nonfederal grazing lands, acres of fair and poor rangeland, wind erosion above T, acres of cropland eroding above T, and acres of irrigated cropland—are all descriptors of this type of agriculture. In addition, factor 1 is also strongly correlated with the livestock animal units variable, although it has a split loading with factor 2. While the number of limited resource producers variable has a split loading between this factor and factor 2, it is most heavily loaded with this factor.

Factor 2: This factor, like factor 1, has to do with livestock operations, as well as with other important livestock-related variables that affect water quality. Here, the highest loading is with the variable, number of concentrated animal feeding operations/animal feeding operations, (CAFOs) (0.88), although it has the split loading with livestock animal units (0.52). In addition, factor 2 showed high loadings for phosphorous runoff potential and potential for pesticide and nitrogen leaching, which may be related to sediment losses from both animal and cropland agriculture. Moreover, as cropland and CAFOs are usually in the same location, one would expect the variable for acres of nonirrigated cropland to also have a high loading, which it does (0.72).

Factor 3: This factor seems to be related to environmental concerns about wildlife habitat, with the highest loading going to acres of wetland and at-risk species habitat (0.87), as well as to acres of bodies of water, (0.81) coastal zone land (0.80) and acres of forestlands (0.70). Potential for pesticide and nitrogen leaching (0.46) showed a split loading with factor 2.

Factor 4: This factor seems to represent variables relating to specialty crop and intensive agriculture, with high loadings for acres of specialty crops, ratio of commercial fertilizer to cropland, and acres of irrigated cropland, (which had a split loading with factor 1). Also, acres of cropland and pastureland affected by saline and/or sodic conditions, a soil condition that often accompanies irrigated soils, is almost significantly correlated to Factor 4 (0.39). This factor also highly loads with miles of impaired rivers and streams, which may be an indication of water quality and quantity concerns associated with soils that require irrigation. Factor 4 is also highly associated with acres of forestlands eroding above T, many of which are found in the same areas that contain acres of irrigated cropland.

The two variables—air quality nonattainment areas and acres of American Indian tribal lands—did not load onto any of the latent factors. When this happens, the variable has a unique variance that is not explained by the common factors.

Initial EQIP Funding Provided to the States, Fiscal Year 2006

State	General financial assistance	General technical assistance	Colorado Salinity[a]	Performance bonuses[a]	Regional equity[a]	Ground and Surface Water[a]	Klamath Basin[a]	Total EQIP funding[b]
Alabama	$11,692,291	$3,409,837	$0	$1,499,189	$0	$169,802	$0	**$16,771,119**
Alaska	2,065,044	855,803	0	1,729,833	2,189,241	0	0	**6,839,921**
Arizona	19,838,811	4,909,614	0	1,383,866	0	2,195,991	0	**28,328,282**
Arkansas	15,285,890	4,275,715	0	1,845,155	0	3,197,575	0	**24,604,335**
California	35,601,305	9,917,421	0	0	0	12,139,356	5,244,128	**62,902,210**
Colorado	19,166,118	6,402,301	9,746,600	1,153,222	0	4,731,333	0	**41,199,573**
Connecticut	2,276,617	1,298,554	0	0	2,409,129	0	0	**5,984,300**
Delaware	4,262,315	1,120,129	0	1,499,189	559,577	177,342	0	**7,618,551**
Florida	18,598,404	5,661,746	0	0	0	904,160	0	**25,164,310**
Georgia	13,596,275	3,956,923	0	922,578	0	574,887	0	**19,050,663**
Hawaii	2,830,085	1,315,702	0	0	1,826,989	1,537,667	0	**7,510,443**
Idaho	10,402,360	3,120,403	0	2,075,800	0	4,764,140	0	**20,362,703**
Illinois	13,490,217	3,506,538	0	0	0	0	0	**16,996,755**
Indiana	10,199,898	2,756,379	0	0	0	0	0	**12,956,277**
Iowa	19,857,205	5,539,542	0	0	0	212,556	0	**25,609,303**
Kansas	20,568,274	5,916,955	0	0	0	4,277,167	0	**30,762,396**
Kentucky	10,470,827	3,014,900	0	0	0	0	0	**13,485,727**
Louisiana	12,681,547	3,641,657	0	2,075,800	0	493,370	0	**18,892,373**
Maine	4,969,838	1,612,816	0	1,499,189	492,709	387,111	0	**8,961,663**
Maryland	6,057,344	1,919,649	0	0	0	0	0	**7,976,993**
Massachusetts	2,252,718	1,061,011	0	0	2,057,775	9,740	0	**5,381,243**
Michigan	15,171,136	4,586,470	0	0	0	0	0	**19,757,606**
Minnesota	25,108,644	6,645,257	0	0	0	246,344	0	**32,000,245**
Mississippi	12,880,865	3,440,744	0	1,499,189	0	2,953,823	0	**20,774,620[c]**
Missouri	18,150,708	4,835,351	0	0	0	403,185	0	**23,389,244**
Montana	22,189,687	5,834,973	0	1,153,222	0	2,491,718	0	**31,669,601**
Nebraska	20,543,213	5,607,316	0	0	0	5,634,218	0	**31,784,747**
Nevada	4,568,635	1,578,562	0	0	1,266,836	842,096	0	**8,256,129**
New Hampshire	1,665,326	771,967	0	0	3,022,681	0	0	**5,459,975**
New Jersey	2,831,241	1,055,596	0	0	1,627,774	0	0	**5,514,610**
New Mexico	16,436,791	5,168,241	0	2,306,444	0	1,332,763	0	**25,244,238**
New York	11,000,760	3,416,030	0	0	0	0	0	**14,416,790**
North Carolina	14,156,869	3,741,418	0	0	0	300,995	0	**18,199,282**

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State	General financial assistance	General technical assistance	Colorado Salinity[a]	Performance bonuses[a]	Regional equity[a]	Ground and Surface Water[a]	Klamath Basin[a]	Total EQIP funding[b]
North Dakota	16,419,674	4,644,465	0	1,960,477	0	117,791	0	**23,142,407**
Ohio	11,752,789	3,834,502	0	1,268,544	0	0	0	**16,855,835**
Oklahoma	20,967,673	5,195,174	0	2,075,800	0	966,706	0	**29,205,352**
Oregon	11,345,753	3,096,493	0	1,614,511	0	2,251,318	5,593,064	**23,901,139**
Pennsylvania	10,470,862	3,364,889	0	0	0	0	0	**13,835,751**
Rhode Island	940,474	337,025	0	0	3,600,911	0	0	**4,878,410**
South Carolina	5,845,873	2,103,593	0	1,845,155	0	0	0	**9,794,621**
South Dakota	15,806,924	4,488,602	0	1,153,222	0	555,182	0	**22,003,929**
Tennessee	10,020,289	2,821,655	0	0	0	0	0	**12,841,944**
Texas	65,270,552	17,442,105	0	1,383,866	0	7,193,968	0	**91,290,491**
Utah	8,918,556	3,728,733	9,746,600	2,075,800	0	1,289,849	0	**25,759,537**
Vermont	2,323,794	1,157,690	0	0	2,370,729	0	0	**5,852,213**
Virginia	10,803,694	2,909,515	0	1,268,544	0	0	0	**14,981,753**
Washington	13,651,196	3,463,804	0	1,037,900	0	2,087,065	0	**20,239,965**
West Virginia	4,328,232	1,594,233	0	0	1,525,651	0	0	**7,448,115**
Wisconsin	16,218,507	4,262,300	0	0	0	174,865	0	**20,655,672**
Wyoming	10,914,358	2,962,722	44,000	2,191,122	0	2,242,966	0	**18,355,168**
Pacific Basin	1,370,851	239,153	0	0	0	0	0	**1,610,004**
Puerto Rico[d]	4,364,658	1,391,991	0	0	1,050,000	180,892	0	**6,987,541**
Total[e]	**$662,601,964**	**$190,934,165**	**$19,537,200**	**$38,517,615**	**$24,000,000**	**$67,037,941**	**$10,837,192**	**$1,013,466,074**

Source: GAO analysis of NRCS data.

Note: Dollars allocated at the national level to producers through Conservation Innovation Grants are not included.

[a]NRCS provides these funds to the states through both financial and technical assistance, the majority of which are financial assistance.

[b]The source for data on total EQIP funding, except for Mississippi, is NRCS at http://www.nrcs.usda.gov/PROGRAMS/2006_allocations/2006Allocationstostatesbyprog/FY2006program_allocations_by_states.html. Due to rounding, totals may not equal the sum of funding from all categories.

[c]Mississippi's funding total is approximately $189,000 more than what was reported by NRCS. The $189,000 represents a payment transfer made from the Mississippi state office to headquarters for training. In order to consistently represent the initial amount of funding each NRCS state office received from headquarters, we included this $189,000 in Mississippi's funding total.

[d]Totals for Puerto Rico also include funding provided to the U.S. Virgin Islands.

[e]Total funding may not equal the sum of state funding due to rounding.

Historical EQIP Funding Levels, Fiscal Years 2001-2006

State	2001	2002	2003	2004	2005	2006[a]
Alabama	$3,682,300	$7,113,500	$10,682,200	$13,637,700	$16,285,108	$16,771,119
Alaska	498,700	996,200	1,330,900	9,087,600	7,345,521	6,839,921
Arizona	7,107,300	12,314,800	13,579,100	20,017,300	22,584,523	28,328,282
Arkansas	4,557,300	8,353,300	12,880,500	20,835,800	23,652,812	24,604,335
California	9,184,200	19,137,900	48,581,600	56,981,700	62,114,391	62,902,210
Colorado	7,074,000	14,432,500	25,560,300	36,931,700	39,185,835	41,199,573
Connecticut	790,300	1,541,700	2,379,700	8,021,300	6,171,688	5,984,300
Delaware	968,500	1,939,200	3,032,600	5,366,500	6,532,427	7,618,551
Florida	5,365,800	10,178,300	15,554,300	22,392,900	24,123,030	25,164,310
Georgia	4,107,200	8,010,200	12,167,200	16,188,600	18,674,184	19,050,663
Hawaii	648,900	1,384,200	1,969,800	8,060,300	8,192,003	7,510,443
Idaho	3,328,800	6,416,800	17,727,900	18,994,300	19,174,741	20,362,703
Illinois	4,156,300	7,798,000	12,108,000	16,729,200	17,969,667	16,996,755
Indiana	2,757,600	5,140,200	8,111,900	11,599,400	12,574,260	12,956,277
Iowa	7,036,400	8,994,800	14,231,400	23,399,700	25,856,704	25,609,303
Kansas	5,014,700	10,448,800	19,763,400	28,144,400	30,447,213	30,762,396
Kentucky	3,111,400	5,913,300	8,958,100	12,039,300	13,288,086	13,485,727
Louisiana	3,947,800	7,089,900	10,913,400	15,156,500	18,048,303	18,892,373
Maine	1,982,000	3,070,500	4,380,300	9,155,900	9,806,574	8,961,663
Maryland	2,067,600	3,396,800	5,125,400	6,701,100	7,732,193	7,976,993
Massachusetts	933,600	1,715,200	2,632,600	6,453,000	4,952,573	5,381,243
Michigan	4,334,400	8,225,400	12,713,300	17,463,300	18,629,584	19,757,606
Minnesota	5,788,200	11,483,700	19,012,100	29,423,700	32,924,161	32,000,245
Mississippi	5,218,700	8,298,100	11,860,200	19,492,400	21,420,866	20,774,620[b]
Missouri	5,042,500	9,944,300	15,271,600	22,394,800	23,379,201	23,389,244
Montana	6,463,100	13,295,500	19,354,600	28,432,400	31,810,709	31,669,601
Nebraska	4,805,400	10,673,400	20,441,800	29,600,300	32,123,093	31,784,747
Nevada	1,432,700	2,773,700	4,467,000	9,452,900	8,914,534	8,256,129
New Hampshire	614,800	1,265,400	1,779,700	2,297,000	5,726,909	5,459,975
New Jersey	965,100	1,891,900	2,919,200	5,784,000	4,386,375	5,514,610
New Mexico	5,796,800	12,460,100	16,143,600	27,889,800	29,802,972	25,244,238
New York	3,822,800	6,774,000	10,355,500	12,484,700	13,128,566	14,416,790
North Carolina	4,572,300	8,590,100	13,169,500	16,473,100	17,985,395	18,199,282
North Dakota	4,263,300	8,710,200	14,394,600	19,181,100	22,014,952	23,142,407
Ohio	3,250,900	6,505,300	10,150,400	13,412,400	15,823,019	16,855,835

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State	2001	2002	2003	2004	2005	2006[a]
Oklahoma	5,018,900	9,290,600	13,913,400	25,378,800	29,017,864	29,205,352
Oregon	4,383,600	7,404,400	17,950,700	21,615,200	21,839,220	23,901,139
Pennsylvania	3,364,400	5,960,600	9,056,800	11,853,900	12,828,822	13,835,751
Rhode Island	422,900	841,400	1,309,100	1,026,800	5,461,693	4,878,410
South Carolina	2,281,700	4,453,700	6,812,400	9,025,800	9,663,381	9,794,621
South Dakota	4,695,000	10,424,500	13,595,200	19,076,300	20,547,674	22,003,929
Tennessee	3,114,500	5,913,100	8,935,400	11,513,300	12,759,284	12,841,944
Texas	15,187,200	28,700,500	57,717,300	78,565,800	90,007,418	91,290,491
Utah	4,655,000	10,139,900	14,565,800	20,976,900	23,107,745	25,759,537
Vermont	1,281,800	1,907,700	2,687,100	7,341,400	5,739,903	5,852,213
Virginia	3,172,500	6,216,300	9,494,700	12,366,100	13,336,380	14,981,753
Washington	4,194,000	7,420,300	12,937,800	18,549,900	20,694,391	20,239,965
West Virginia	1,807,400	3,507,700	5,313,600	8,690,200	7,404,453	7,448,115
Wisconsin	4,554,800	8,730,200	13,486,800	18,960,500	20,962,647	20,655,672
Wyoming	3,684,700	7,217,800	11,335,200	16,135,900	17,803,201	18,355,168
Pacific Basin	346,300	582,100	958,200	866,800	1,771,577	1,610,004
Puerto Rico[c]	964,700	1,808,800	2,928,100	6,660,200	6,150,928	6,987,541
Total	**$197,821,100**	**$376,796,800**	**$626,701,300**	**$908,279,900**	**$991,878,752**	**$1,013,466,074**

Source: GAO analysis of NRCS data.

[a]The data source for fiscal year 2006 total EQIP funding, except for Mississippi, was NRCS's Web site: http://www.nrcs.usda.gov/PROGRAMS/2006_allocations/2006Allocationstostatesbyprog/FY2006program_allocations_by_states.html .

[b]Mississippi's funding total for 2006 is approximately $189,000 more than what was reported by NRCS. The $189,000 represents a payment transfer made from the Mississippi state office to headquarters for training.

[c]Totals for Puerto Rico also include funding provided to the U.S. Virgin Islands.

Fiscal Year 2005 EQIP Obligations by Conservation Practice

Practice name/payment type	Number[a]	EQIP dollars obligated	Ground and Surface Water Conservation dollars obligated	Klamath dollars obligated	Total dollars obligated	Percentage of total
Waste storage facility	2,983	$91,086,442	$13,500	$0	$91,099,942	11.43%
Fence	19,303	59,497,144	80,456	72,012	59,649,612	7.48
Irrigation system, sprinkler	3,633	40,316,414	14,649,127	3,184,141	58,149,682	7.29
Brush management	9,664	38,418,198	8,160	0	38,426,358	4.82
Nutrient management	28,203	31,364,894	202,457	0	31,567,351	3.96
Pipeline	10,337	30,219,008	13,115	1,350	30,233,473	3.79
Irrigation water conveyance, pipeline, high pressure, underground, plastic	2,911	21,842,555	3,850,154	1,453,781	27,146,491	3.41
Irrigation system, trickle	1,321	16,623,856	9,606,358	0	26,230,214	3.29
Pasture and hayland planting	11,582	23,856,494	118,962	0	23,975,456	3.01
Pest management	19,190	22,803,131	227,884	0	23,031,015	2.89
Heavy use area protection	4,689	22,119,580	0	0	22,119,580	2.77
Residue management, no till and strip till	8,355	21,516,049	281,657	0	21,797,706	2.73
Trough or tank	13,770	20,854,462	15,177	1,875	20,871,514	2.62
Prescribed grazing	12,736	17,266,545	285,858	537,144	18,089,547	2.27
Grade stabilization structure	3,630	15,101,275	54,118	9,000	15,164,393	1.90
Residue management, mulch till	3,397	14,289,883	185,416	0	14,475,299	1.82
Well	3,275	12,745,858	56,865	0	12,802,723	1.61
Irrigation water conveyance, pipeline, low pressure underground, plastic	1,447	8,916,088	2,329,292	1,428,530	12,673,910	1.59
Manure transfer	1,223	11,800,218	57,660	0	11,857,878	1.49
Pond	4,006	11,375,676	31,678	0	11,407,354	1.43
Irrigation land leveling	1,190	9,387,978	1,966,210	9,600	11,363,788	1.43
Terrace	2,961	11,340,023	11,870	0	11,351,893	1.42
Structure for water control	3,456	8,323,788	2,217,993	325,373	10,867,154	1.36
Underground outlet	2,811	8,702,037	124,150	0	8,826,187	1.11
Pumping plant for water control	2,203	7,287,132	878,852	591,736	8,757,720	1.10
Forest stand improvement	2,772	8,612,338	0	47,520	8,659,858	1.09
Conservation crop rotation	2,682	2,579,277	6,072,364	0	8,651,641	1.09
Composting facility	513	8,061,771	0	0	8,061,771	1.01
Grassed waterway	2,635	7,071,664	5,096	0	7,076,760	0.89
Irrigation water management	5,319	3,694,001	2,844,830	250,556	6,789,387	0.85

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Practice name/payment type	Number[a]	EQIP dollars obligated	Ground and Surface Water Conservation dollars obligated	Klamath dollars obligated	Total dollars obligated	Percentage of total
Water and sediment control basin	1,732	6,531,431	20,100	0	6,551,531	0.82
Waste utilization	2,245	5,751,350	0	0	5,751,350	0.72
Tree/shrub establishment	2,618	5,355,933	5,739	23,835	5,385,507	0.68
Cover crop	2,997	5,150,505	224,470	1,440	5,376,415	0.67
Range planting	1,810	5,221,400	151,840	315	5,373,555	0.67
Atmospheric resource quality management	2,150	5,308,280	0	0	5,308,280	0.67
Access road	1,067	4,673,395	0	3,750	4,677,145	0.59
Irrigation water conveyance, ditch and canal, nonreinforced concrete	324	3,718,626	805,511	0	4,524,137	0.57
Streambank and shoreline protection	502	4,467,492	15,486	15,000	4,497,978	0.56
Agrochemical mixing facility[b]	379	4,436,661	0	0	4,436,661	0.56
Wastewater and feedlot runoff control[b]	98	3,750,526	0	0	3,750,526	0.47
Forest site preparation	1,609	3,728,573	0	0	3,728,573	0.47
Critical area planting	5,204	3,016,223	38,433	1,125	3,055,781	0.38
Incentive payment for comprehensive nutrient management plan	1,423	3,049,132	0	0	3,049,132	0.38
Subsurface drain	722	2,967,580	0	0	2,967,580	0.37
Sediment basin	322	2,744,387	1,645	0	2,746,032	0.34
Waste treatment lagoon	333	2,072,400	630,734	0	2,703,134	0.34
Irrigation water conveyance, pipeline, rigid gated pipeline	737	2,396,798	156,156	63,362	2,616,316	0.33
Closure of waste impoundment	137	2,428,288	0	0	2,428,288	0.33
Residue management, direct seed[b]	638	2,404,419	5,000	0	2,409,419	0.30
Diversion	1,068	2,264,307	1,380	0	2,265,687	0.28
Prescribed burning	1,763	2,243,540	0	0	2,243,540	0.28
Irrigation system, tailwater recovery	172	1,675,379	429,927	13,500	2,118,806	0.27
Use exclusion	1,264	2,116,869	1,770	0	2,118,639	0.27
Animal trails and walkways	545	2,007,572	0	0	2,007,572	0.25
Spring development	1,278	1,984,575	0	0	1,984,575	0.25
Windbreak/shelterbreak establishment	1,277	1,796,732	21,978	0	1,818,710	0.23
Long term no till[b]	463	1,717,823	0	0	1,717,823	0.22
Stream crossing[b]	668	1,617,152	0	0	1,617,152	0.20
Irrigation storage reservoir	69	739,821	815,416	0	1,555,237	0.20
Reimbursement for technical service provider, design	2,862	1,516,129	36,669	0	1,552,797	0.19

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Practice name/payment type	Number[a]	EQIP dollars obligated	Ground and Surface Water Conservation dollars obligated	Klamath dollars obligated	Total dollars obligated	Percentage of total
Pond sealing or lining, flexible membrane	56	1,548,195	0	0	1,548,195	0.19
Roof runoff management	729	1,542,321	1,500	0	1,543,821	0.19
Alum treatment of poultry litter[b]	603	1,207,459	0	0	1,207,459	0.15
Irrigation regulating reservoir	165	944,204	250,180	0	1,194,384	0.15
Wildlife upland habitat management	1,285	1,167,347	22,897	0	1,190,244	0.15
Animal mortality facility	242	1,144,067	0	0	1,144,067	0.14
Open channel	32	983,142	0	0	983,142	0.12
Lined waterway or outlet	166	955,446	0	0	955,446	0.12
Firebreak	601	919,207	8,280	0	927,487	0.12
Irrigation system, surface and subsurface	132	667,096	236,679	0	903,775	0.11
Forest harvest trails and landings	249	866,311	0	0	866,311	0.11
Residue management, seasonal	298	801,742	10,122	0	811,864	0.10
Irrigation water conveyance, pipeline, unspecified type	125	681,791	72,246	0	754,037	0.09
Reimbursement for technical service provider, construction	1,864	709,354	7,626	0	716,981	0.09
Obstruction removal	207	697,581	5,550	0	703,131	0.09
Mulching	568	677,376	12,475	0	689,851	0.09
Pond sealing or lining, bentonite	54	676,910	0	0	676,910	0.08
Wildlife habitat restoration and management	238	613,289	1,065	0	614,354	0.08
Wastewater, milkhouse treatment system[b]	30	586,991	0	0	586,991	0.07
Water harvesting catchment	49	436,851	148,500	0	585,351	0.07
Storm water wet detention/chemical treatment system[b]	3	581,251	0	0	581,251	0.07
Field border	724	524,775	4,860	0	529,635	0.07
Filter strips	801	527,986	1,550	0	529,536	0.07
Toxic salt reduction	223	528,113	0	0	528,113	0.07
Precision land forming	57	527,826	0	0	527,826	0.07
Riparian forest buffer	453	469,753	0	2,250	472,003	0.06
Land smoothing	223	434,267	3,688	7,628	445,583	0.06
Well decommissioning	484	429,531	15,286	0	444,817	0.06
Windbreak/shelterbreak renovation	228	427,053	0	0	427,053	0.05
Reimbursement for technical service provider, certification	2,127	410,614	11,466	0	422,079	0.05
Dike	95	418,129	0	0	418,129	0.05

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Practice name/payment type	Number[a]	EQIP dollars obligated	Ground and Surface Water Conservation dollars obligated	Klamath dollars obligated	Total dollars obligated	Percentage of total
Incinerator[b]	72	409,113	0	0	409,113	0.05
Reimbursement for technical service provider, planning	282	389,035	0	0	389,035	0.05
Animal use area protection[b]	107	388,377	0	0	388,377	0.05
Hedgerow planting	111	376,818	0	0	376,818	0.05
Tree/shrub pruning	253	358,758	0	0	358,758	0.04
Barnyard runoff management[b]	19	344,198	0	0	344,198	0.04
Feed management	287	327,729	0	0	327,729	0.04
Conservation cover	489	302,024	10,041	0	312,065	0.04
Chiseling and subsoiling	228	305,754	4,800	0	310,554	0.04
Wildlife habitat, early successional	362	310,026	0	0	310,026	0.04
Anaerobic digester, ambient temperature	2	300,001	0	0	300,001	0.04
Residue management	184	284,296	0	0	284,296	0.04
Fish passage	22	262,056	7,789	9,911	279,756	0.04
Surface drainage, main or lateral	15	263,977	3,411	0	267,388	0.03
Wastewater treatment strip	98	261,499	0	0	261,499	0.03
Irrigation water conveyance, pipeline, steel	97	226,747	23,293	1,200	251,240	0.03
Shellfish aquaculture management[b]	63	247,909	0	0	247,909	0.03
Irrigation water conveyance, pipeline, nonreinforced concrete	14	240,950	0	0	240,950	0.03
Closure of waste impoundment[b]	91	224,816	0	0	224,816	0.03
Fish stream improvement	34	202,469	1,006	0	203,475	0.03
Aquaculture ponds	200	6,000	196,524	0	202,524	0.03
Anaerobic digester, controlled temperature	5	195,000	0	0	195,000	0.02
Agricultural fuel containment facility[b]	63	194,607	0	0	194,607	0.02
Stream channel stabilization	26	185,418	200	0	185,618	0.02
Pond sealing or lining, soil dispersant	30	171,387	5,370	0	176,757	0.02
Irrigation field ditch	55	175,048	0	0	175,048	0.02
Residue management, ridge till	97	146,536	150	0	146,686	0.02
Transition to organic production[b]	99	132,781	0	0	132,781	0.02
Forage harvest management	154	62,461	66,996	0	129,457	0.02
Shallow water for wildlife	162	101,607	14,627	0	116,234	0.01
Wetland restoration	40	115,663	0	0	115,663	0.01
Dam, floodwater retarding	13	115,385	0	0	115,385	0.01

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Practice name/payment type	Number[a]	EQIP dollars obligated	Ground and Surface Water Conservation dollars obligated	Klamath dollars obligated	Total dollars obligated	Percentage of total
Clearing and snagging	12	106,250	0	0	106,250	0.01
Digester, complete mix[b]	13	105,600	0	0	105,600	0.01
Dam, diversion	25	96,877	6,330	0	103,207	0.01
Wildlife watering facility	141	88,417	0	0	88,417	0.01
Wetland enhancement	31	79,020	0	0	79,020	0.01
Grazing land mechanical treatment	68	74,389	0	0	74,389	0.01
Solid/liquid waste separation facility	1	72,000	0	0	72,000	0.01
Contour farming	129	69,690	0	0	69,690	0.01
Livestock shade structure[b]	23	67,146	0	0	67,146	0.01
Stripcropping, contour	63	65,270	0	0	65,270	0.01
Silage leachate collection and transfer[b]	2	65,190	0	0	65,190	0.01
Hillside ditch	34	57,056	0	0	57,056	0.01
Irrigation water conveyance, pipeline, aluminum tubing	9	15,995	2,250	35,412	53,657	0.01
Land clearing	59	50,970	0	0	50,970	0.01
Digester, plug flow[b]	13	49,500	0	0	49,500	0.01
Cross wind ridges	33	45,956	0	0	45,956	0.01
Farm evaluation[b]	42	45,500	0	0	45,500	0.01
Pond sealing or lining, unspecified type	6	42,495	0	0	42,495	0.01
Riparian herbaceous buffer	70	41,440	0	0	41,440	0.01
Fuel break	17	38,556	0	0	38,556	0.00
Pathogen management[b]	69	34,500	0	0	34,500	0.00
Waste field storage area[b]	11	31,874	0	0	31,874	0.00
Waterspreading	6	31,264	0	0	31,264	0.00
Fish raceway or tank	1	27,125	0	0	27,125	0.00
Irrigation canal or lateral	4	25,157	1,406	0	26,563	0.00
Temporary steel work[b]	6	25,416	0	0	25,416	0.00
Contour orchard and other fruit area	130	24,796	0	0	24,796	0.00
Wetland, constructed	5	23,621	0	0	23,621	0.00
Vegetative barrier	13	22,494	0	0	22,494	0.00
Alley cropping	86	21,963	0	0	21,963	0.00
Regulating water in drainage systems	13	19,466	0	0	19,466	0.00
Surface roughening	11	18,207	0	0	18,207	0.00

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Practice name/payment type	Number[a]	EQIP dollars obligated	Ground and Surface Water Conservation dollars obligated	Klamath dollars obligated	Total dollars obligated	Percentage of total
Irrigation water conveyance, ditch and canal, flexible membrane	8	913	16,359	0	17,272	0.00
Channel vegetation	15	14,730	2,400	0	17,130	0.00
Sinkhole treatment[b]	10	13,988	0	0	13,988	0.00
Irrigation water conveyance, ditch and canal, unspecified type	2	13,260	0	0	13,260	0.00
Vertical drain	12	13,251	0	0	13,251	0.00
Recreation trail and walkway	1	13,000	0	0	13,000	0.00
Wildlife wetland habitat management	71	11,860	0	0	11,860	0.00
Waste facility cover	1	10,080	0	0	10,080	0.00
Contour buffer strips	26	10,052	0	0	10,052	0.00
Soil salinity management, nonirrigated	24	9,390	0	0	9,390	0.00
Spoil spreading	5	9,021	0	0	9,021	0.00
Surface drainage, field ditch	16	7,010	870	0	7,880	0.00
Well testing[b]	36	7,560	0	0	7,560	0.00
Herbaceous wind barriers	13	7,139	0	0	7,139	0.00
Wetland creation	5	6,990	0	0	6,990	0.00
Pasture and hayland management	3	5,898	0	0	5,898	0.00
Monitoring well	1	4,875	0	0	4,875	0.00
Invasive plant species control[b]	4	4,292	0	0	4,292	0.00
Row arrangement	3	3,126	0	0	3,126	0.00
Infiltration ditches[b]	8	2,768	0	0	2,768	0.00
Air management[b]	4	2,570	0	0	2,570	0.00
Anionic polyacrylamide erosion control	5	2,359	0	0	2,359	0.00
Soil salinity control[b]	4	2,232	0	0	2,232	0.00
Cross wind trap strips	2	2,030	0	0	2,030	0.00
Silvopasture establishment	3	1,890	0	0	1,890	0.00
Cross wind stripcropping	3	1,440	0	0	1,440	0.00
Irrigation water conveyance, pipeline, reinforced plastic mortar	2	1,260	0	0	1,260	0.00
Cistern[b]	1	750	0	0	750	0.00
Irrigation water conveyance, pipeline, corrugated metal pipeline	2	0	12	527	539	0.00
Snow harvesting[b]	2	500	0	0	500	0.00
Dry hydrant	1	373	0	0	373	0.00

(Continued From Previous Page)

Practice name/payment type	Number[a]	EQIP dollars obligated	Ground and Surface Water Conservation dollars obligated	Klamath dollars obligated	Total dollars obligated	Percentage of total
Water well testing	1	50	0	0	50	0.00
Total[c]	**248,998**	**$738,429,353**	**$50,729,316**	**$8,091,873**	**$797,250,542**	**100.00%**

Source: GAO analysis of NRCS data.

Note: This table only provides data on financial assistance obligations. It does not contain data on technical assistance obligations. The data used were generated in March 2006 and represent obligations as of that date. NRCS said the database from which these data were generated is continually modified as contracts are altered or cancelled.

[a]In fiscal year 2005, NRCS entered into 49,406 contracts for the EQIP program. Each contract included one or more practices. This column represents the total number of practices for which EQIP, Ground and Surface Water Conservation, and Klamath Basin funds were obligated.

[b]This represents an interim state practice, rather than a national approved practice. Interim state practices are tested by NRCS for 2 years, after which they are approved for national use, extended for further testing, added to an existing state standard, or cancelled.

[c]Totals may not add due to rounding.

Comments from the U. S. Department of Agriculture

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
P.O. Box 2890
Washington, D.C. 20013

AUG 25 2006

Mr. Daniel Bertoni
Acting Director
Natural Resources and Environment
Government Accountability Office
441 G Street, N.W.
Washington, D.C. 20548

Dear Mr. Bertoni:

The Natural Resources Conservation Service (NRCS) appreciates the opportunity to respond to the Government Accountability Office (GAO) draft report, "USDA Should Improve Its Process for Allocating Funds to States for the Environmental Quality Incentives Program (EQIP)."

As reflected in the draft report, NRCS acknowledges that the EQIP allocation formula, including weights and data sources, needs review. The report accurately conveys the proactive steps taken by the Agency to re-examine the process for the allocation of EQIP funds to States including:

- Planning for a reassessment of the EQIP financial assistance formula; and
- Issuing a request for proposals soliciting for an independent review of all NRCS conservation program allocation formulas and recommendations for changes, enhancements, and new data sources.

However, NRCS believes the GAO finding that "the NRCS funding process is not clearly linked to EQIP's purpose of optimizing environmental benefits" is not accurate. The Agency requests that this finding be reconsidered and reworded.

The Agency believes that there is a connection between the allocation process, which considers factors related to the natural resource base and the condition of those resources, and optimizing environmental benefits. Some formula data sources and weights will be updated, but the types of factors used would be needed in any process that attempts to inventory natural resource conditions and optimize environmental benefits.

It is important to recognize that the EQIP financial assistance formula was never intended to be static. It is updated periodically to reflect new data and changing emphasis in priorities.

Additionally, the EQIP allocation process is one of four components considered in optimizing environmental benefits. NRCS' approach to optimize environmental benefits, as described in 7 C.F.R. 1466, integrates consideration of national priorities in four key program components: 1) the allocation of financial resources to States; 2) the location of financial resources within States; 3) the selection of conservation practices and the establishment of cost-share and incentive payment levels; and 4) the application evaluation and ranking process.

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Mr. Daniel Bertoni
Page 2

NRCS would like to re-emphasize the continuing improvement in establishing performance measures to track the benefits produced through EQIP. The Agency first established long-term performance measures for all of its programs, including EQIP, in its 1997 Strategic Plan pursuant to the Government Performance and Results Act of 1993. Since that time, the Agency's process for performance measure establishment and goal setting has become more refined, reflecting improved data and measurement methods. The current EQIP long-term performance measures were developed using a logic model and Agency approval process, and reflect the most recent results of the Agency's effort to track and report program performance. These long-term measures were incorporated into the NRCS Strategic Plan, 2005–2010, to strengthen the reflection of Agency programs in the plan. On an annual basis, EQIP's annual performance and efficiency measures are reported to provide a yearly indication of progress toward the program's long-term objectives.

Again, thank you for giving us the opportunity to respond to this draft report. If you have any questions, please contact Lesia Young, Natural Resource Manager, Operations Management and Oversight Division, at (202) 720-6707.

Sincerely,

Arlen L. Lancaster
Chief

cc:
June C. Hill, USDA GAO Liaison Manager, Office of the Inspector General
Ron Maxon, Assistant Director, Government Accountability Office

GAO Contact and Staff Acknowledgments

GAO Contact

Daniel Bertoni (202) 512-3841

Staff Acknowledgments

In addition to the individual named above, Ronald E. Maxon, Jr., Assistant Director; William Bates; Thomas Cook; Barbara El Osta; Paige Gilbreath; Lynn Musser; Omari Norman; and Carol Herrnstadt Shulman made key contributions to this report.

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