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Improving Federal Allocation of EQIP Funding

Evaluation of and response to past and current
decision pathways employed for determining
state allocation of EQIP funding under NRCS

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EXECUTIVE SUMMARY

The motivation behind this report is to evaluate and respond to past and current decision pathways employed for determining state allocation of the Environmental Quality Incentives Program [EQIP] funding under the Natural Resource Conservation Service [NRCS]. We work to provide justifiable recommendations for how the allocation of EQIP dollars might be improved, especially as it pertains to improving equity among those states with the highest priority needs. The distribution mechanism of federal EQIP funding to each state has received significant criticism in the past. The criticism stems primarily from the usage of a weighted factor formula that has been thought to unfairly favor certain states over others. Beyond questions of equity, there have also been more fundamental concerns over the quality of data inputted into the funding formula. In this project, we worked with our client, a Program Analyst at the North Carolina NRCS office, to tailor our recommendations to the specific concerns of one state. Our client's specific concern was that North Carolina has historically been positioned lower in the national ranking of EQIP funding that it receives as compared to many other large agricultural states.

To better understand the process of federal EQIP allocation, we reviewed the history of EQIP, examined the past and current decision pathways used to determine federal allocation of conservation dollars to state NRCS offices, conducted interviews among NRCS staff, and quantitatively analyzed the funding allocation process. We provide scenarios for how it might be possible for a state like North Carolina to increase the allocation of EQIP funding that it receives and attain better conservation on identified lands of highest priority. We expect that our recommendations targeted at helping EQIP improve equity among states in the federal funding allocation process, will ultimately lead to a rise in North Carolina's allocation of EQIP funds and in its national ranking among other states.

In this project, the formula we use to develop our quantitative analysis of the federal EQIP allocation process is the formula used by NRCS for fiscal years 2009-2011. The EQIP formula includes two parts: financial assistance and technical assistance. From our analysis, we developed a number of scenarios that propose ways in which the funding formula might be changed to better address different social or environmental issues and to serve those states that, in the past, have struggled to receive the same budgetary support as other states, and so are less likely to see the needs of their farmers and the conservation needs of their land be served to the same degree.

Our evaluation led us to make a number of recommendations that we expect will move EQIP more in line with its stated goal of optimizing environmental benefits. Our recommendations are also made with the goal to reduce or eliminate many of the inconsistencies and criticisms that have beleaguered past EQIP funding allocation processes.

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I. INTRODUCTION

a. About Conservation Payment Programs

The United States Department of Agriculture [USDA] provides a number of opportunities to farmers and ranchers to voluntarily participate in conservation payment programs through the Natural Resources Conservation Service [NRCS]. Such programs are authorized by legislation commonly known as Farm Bills. Conservation payment programs offer financial incentives for participation as opposed to regulation that mandates compliance and generally does not offer compensation for costs.

In 2012, the U.S. government spent an estimated \$5.4 billion on conservation programs enacted under the Farm Bill (Office of Management and Budget, 2012). The primary motivation of conservation programs is to conserve pristine natural lands and to improve degraded working lands. One example of the environmental benefits of conservation programs is that many provide incentives for the adoption of no-till and mulch till practices. Conservation tillage reduces soil erosion and non-point source pollution, such as phosphorus and nitrogen runoff, resulting in cleaner lakes and rivers (Bayliss, Feather, Padgitt, Sandretto, 2002). In addition, conservation tillage improves soil health and organic matter absorption. Conservation programs may also seek to protect wildlife by preserving natural habitats and corridors.

A secondary motivation of conservation payment programs is to assist farmers in meeting the mandates of environmental regulation both at the federal and state levels. Voluntary publicly-financed programs are generally heralded as a less combative approach to conservation than regulation (Echeverria, 2005, p. 20). In Regulating versus Paying Land Owners to Protect the Environment, law professor John Echeverria lists faster adoption, innovation, and invoking a spirit of cooperation as advantages of voluntary approaches. “By making friends with, rather than waging war on, land owners this approach encourages owners to support rather than oppose conservation programs,” (Echeverria, 2005, p. 20). In addition, such approaches allow governments to internalize the social costs of conservation. This is seen as fairer than forcing producers to bear the costs of regulation individually.

Conservation payment programs can also add economic value to communities by increasing expenditures on outdoor recreation and tourism. A 2004 study of freshwater (fishing, swimming, boating) and wildlife (hunting and viewing) based recreational activities by the Economic Research Service [ERS] of USDA found that improved wildlife, water, and air quality as a result of conservation programs was “a significant stimulus to rural economies,” (Bucholtz, et. al, 2004, p.67). The report found that participation in the Conservation Reserve Program [CRP] alone could add up to \$300 million annually in economic value to rural communities. In addition, a study of land value in the United States found that the CRP not only increased farmland value by \$18-25 an acre, but also increased developed land values by \$6-274 an acre (Wu & Lin, 2010).

Finally, conservation payment programs help preserve land for future generations. As one CRP participant, William Henke, said, “The financial incentives offered by CRP were

sufficient to encourage us to engage in conservation actions which we may not otherwise have afforded or considered,” (Farm Service Agency, n.d.). Without the CRP program, the Henkes believe they would have been most likely forced to sell their land to an outside developer. Conservation payment programs help compensate land owners for the losses they may take in the short-term by not engaging in environmentally destructive activities, so that future generations may profit in the long run from more agriculturally productive lands.

b. About the Environmental Quality Incentives Program

The Environmental Quality Incentives Program [EQIP], under the NRCS of the USDA operates as a conservation payment program for private landowners who might be incentivized to implement best management practices on their agricultural land. It is the second largest Farm Bill conservation program by spending, surpassed only by the Conservation Reserve Program (Office of Management and Budget, 2012). Participants are eligible for up to \$300,000 in payments over a six year period (Environmental Quality Incentives Program, 2012). The program is aimed at achieving conservation and improved environmental quality of land that would otherwise be degraded and/or contribute to pollution of air and waterways. Currently there are over 80 eligible practices ranging from planting cover crops to managing waste treatment lagoons to improving habitat for wildlife.

EQIP encourages sound conservation practices by providing direct payments in the form of reimbursements to producers for successful completion of conservation practices. In addition, NRCS provides technical assistance to farmers by recommending suitable conservation practices and aiding in the development of plans for implementation on individual farms.

At its inception, the primary objective of EQIP was to allay the financial and administrative costs that farmers faced in implementing sound conservation practices (Hearing Before the Subcommittee on Forestry, 1998). Legislators hoped to accomplish this through “a voluntary incentive-driven approach,” (Hearing Before the Subcommittee on Forestry, 1998, p.13).

Accordingly, the program seeks to benefit three types of producers: those who are facing “the most serious threats” to natural resources on their lands; those who need assistance in complying with environmental regulations, both state and federal; and those who want to make “beneficial, cost-effective changes” to their lands for the purposes of conservation (Federal Agriculture Improvement and Reform Act, 1996, sec.1240).

A secondary objective was a desire to transition to more locally-led conservation, using a “bottom-up approach,” (Hearing Before the Subcommittee on Forestry, 1998, p.39). Local work groups at both county and state levels make recommendations on both geographical priorities and best practices. Funds within states were allocated based on these recommendations. It was believed that those “as close to the ground as possible” were best suited to prioritize projects (Hearing Before the Subcommittee on Forestry, 1998, p.13).

Finally, EQIP was designed to address conservation “with a comprehensive, system-type approach rather than through individual practices that only addresses part of the problem,” (Hearing Before the Subcommittee on Forestry, 1998, p.39). With terms of 5-10 years, EQIP

contracts encouraged farmers to take a long-term approach to conservation. This was a departure from the annual contracts under previous programs. In testimony before Congress, Craig Cox, acting USDA Deputy Under-Secretary for Natural Resources and Environment, explained, “A comprehensive approach encourages farmers and ranchers to consider all of the effects of their actions on their own unit, as well as the impacts beyond their farm and ranch,” (Hearing Before the Subcommittee on Forestry, 1998, p.39).

c. Problem Statement: Towards Greater Equity and Transparency in EQIP Implementation

The equitable distribution of federal EQIP funding to each state has been a contested topic in the past and remains a controversial issue both within NRCS and as a broader issue of concern to elected politicians and other stakeholders. The primary focus of past controversy has been on the rationale of using a set formula of weighted factors for determining where money will flow. The credibility of data sources and the selection of criteria with their chosen weights have often been thought to unfairly favor certain states over others. Consequently, states left feeling underfunded by the EQIP allocation mechanism have claimed they do not receive the same budgetary support as other states, and so are less likely to see the needs of their farmers and the conservation needs of their land be served to the same degree.

In this project, we work to satisfy our client’s question about how North Carolina might increase its budget allocation for EQIP to meet existing demand and rise in the national ranking to join other large agricultural states historically receiving a substantially larger piece of the EQIP pie. To better understand the process of federal EQIP allocation, we reviewed the history of EQIP, examined the past and current decision pathways used to determine federal allocation of conservation dollars to state NRCS offices, conducted interviews among NRCS staff, and quantitatively analyzed the funding allocation process. We use scenario analysis to explore distributional changes of targeting different environmental attributes. This analysis resulted in some states increasing their percentage of EQIP funding received, but our ultimate goal was to attain better conservation on identified lands of highest priority through increased funding.

We determined our primary research question to be: “How can EQIP better optimize conservation benefit per dollar spent?” Our goal was targeted at helping EQIP to improve equity among states in the federal funding allocation process, which may ultimately lead to a rise in North Carolina’s allocation of EQIP funds and in the national ranking of other states.

II. RESEARCH METHODOLOGY

a. Literature Review

We began our analysis by conducting a literature review of the environmental, economic, and social benefits of conservation in general, specifically in regards to a payment-based versus regulatory approach.

Next we sought to construct a clear and comprehensive history of EQIP. We began with the actual text of legislation authorizing the creation and subsequent renewals of EQIP. In addition, we turned to congressional testimony to gain a better understanding of the motivation behind its creation, criticism EQIP has received, and the evolution of the program and its subprograms over time. Accordingly, the majority of our review is pulled from hearings on EQIP's initial implementation, from responses to a critique by the Government Accountability Office, and from information about the formulation of the next Farm Bill.

We also found the aforementioned GAO report to be instrumental in understanding potential shortcomings in EQIP's formula mechanism for allocation of funding to states. Finally, we used budgets published by the White House's Office of Management and Budget to track funding since enactment and for the future.

b. Interviews

In order to capture a comprehensive qualitative assessment of EQIP as it has changed over time and exists today, we conducted interviews with carefully chosen individuals that we felt had certain valuable and undocumented experience with EQIP in its evolution to what it is today. Altogether five interviews were conducted over the span of the project. Names of the interviewees and their affiliation with USDA and NRCS are as follows:

- Craig Cox; former acting USDA Deputy Under-Secretary for Natural Resources and Environment
- Shannon Zezula; State Resource Conservationist, NRCS Indiana
- Matt Flint; Assistant State Resource Conservationist—Technology, NRCS North Carolina
- Katie Cerretani; Management Analyst in the Office of Regional Conservationists at NRCS headquarters in Washington DC
- Paige Gilbreath; staff member of GAO and contributing author of the 2006 GAO report

The state offices of North Carolina and Indiana were strategically chosen because the North Carolina office was the focus of our client's specific question of interest, and Indiana had been recommended as an exceptionally efficient and well-managed office that might serve as a benchmark for the efficacy of other state offices.

Each of the five interviews conducted were semi-structured and over the phone, the approximate length of each was thirty minutes. Interviews with Matt Flint and Craig Cox were sound recorded, the others were not.

c. Scenario Analysis

The funding allocation of EQIP is mainly based on a financial assistance formula, which divides environmental indicators within the agricultural sector into to 4 categories; resource base factors, resources quality factors, cost of doing business factors and performance factors (with an additional section of Technical Assistance in the 2009 EQIP Funding Formula).

Our group developed four scenarios which are meant to illustrate alternative EQIP funding allocation pathways and are designed to address what we identified as EQIP's most critical points of weakness.

Scenario 1: Equity Scenario EQIP financial assistance has been categorized by function (e.g., water quality improvement, land conservation, etc.) and money allocated for each section is compared with the amount funded via EQIP subprograms. This is to check the equity of funding among states and whether EQIP subprograms have over-funded states with prioritized resources concerns.

Scenario 2: Assistance Scenario By examining the colinearity of resource factors in the EQIP formula, a factor reflecting fertilizer application intensity has been added in the baseline formula to check whether the Technical Assistance Allowance, which is meant to assist program implementation, helps increase marginal benefit per EQIP dollar spent.

Scenario 3: Rationale Scenario This scenario is meant to examine the rationale of distributing EQIP funds between resource quantity factors and resource quality factors in the current EQIP formula. By deleting environmental quality factors in the baseline formula, we document how the resource quality to resource quantity ratio changes.

Scenario 4: Weight Scenario The weights of selected environmental factors have been adjusted to see how changes affect the proportion of EQIP funding received by each state.

Finally, we identified a number of reoccurring themes in our analysis. We used these themes as the basis for our recommendations.

III. LITERATURE REVIEW AND INTERVIEWS

a. Legislative History of EQIP

The Federal Agriculture Improvement and Reform Act of 1996 consolidated four conservation programs—the Agricultural Conservation Program, the Great Plains Conservation Program, the Water Quality Incentives Program, and the Colorado River Basin Salinity Control Program—into the newly created Environmental Quality Incentives Program [EQIP] (Federal Agriculture Improvement and Reform, 1996). The motivation for

consolidating four programs into one was two-fold. One, to redesign a program that was specifically intended to target conservation and environmental problems; and second, to create a program that had more political support and therefore greater opportunity for increasing funding over time (C. Cox, personal communication, February 26, 2013). The Act, commonly known as Freedom to Farm Act, was authored by the House Committee on Agriculture, led by Chairman Pat Roberts (R-KS), and the Senate Committee, Agriculture, Nutrition and Forestry, led by Richard Lugar (R-IN) and signed into law by President Bill Clinton in April of 1996. NRCS was tasked with oversight of the program and staff, while the Commodity Credit Corporation administered payments (Federal Agriculture Improvement and Reform, 1996). Freedom to Farm mandated that 50 percent of funding be set aside for practices relating to livestock, it also mandated that the program seek to maximize the environmental benefit per dollar spent (Federal Agriculture Improvement and Reform, 1996).

The Farm Security and Reinvestment Act of 2002 renewed EQIP for six more years (Farm Security and Reinvestment Act, 2002). The 2002 Act relaxed the mandate to maximize the amount of environmental benefit per dollar spent in order to address fears that the requirement excluded participation by small farmers (Hearing Before the Committee on Agriculture, 2007). The 2002 Act also increased the livestock set aside from 50 percent of EQIP funding to 60 percent (Farm Security and Reinvestment Act, 2002). Over the first ten years of its existence, Congress increased funding for EQIP by over 400 percent from \$200 million annually to over \$1 billion (Government Accountability Office, 2006). Appropriations since inception can be found in Appendix 1.

Congress reauthorized EQIP for a second time in the Food, Conservation, and Energy Act of 2008. Funding was increased to a total of \$7.25 billion over four years (Food, Conservation, and Energy Act, 2008). Legislators mandated that 5 percent of funds should target enrollment of socially disadvantaged farmers, with an additional 5 percent targeting beginning farmers (Food, Conservation, and Energy Act, 2008). In addition, these traditionally underserved groups now qualified for pre-construction payments in order to ease liquidity constraints. The definition of conservation was expanded to include both organic farming and the transition to organic production.

In 2012, Congress failed to pass a new Farm Bill, however both the Senate and the House drafted proposed bills. Both were a reflection of the current constrained economic environment. Representative Glenn Thompson testified:

As we work towards the next bill, this Committee will be faced with a very different budget situation. Not only will the Agriculture Committee have to do our part within the overall deficit situation, but as all of us know, we have dozens of programs with no baselines, many under the umbrella of conservation. This farm bill gives the Committee an excellent opportunity to prioritize conservation programs that are working and streamline any programs with overlapping missions and goals (Hearings Before the Committee on Agriculture, 2012, p.1690).

The Senate proposal cut spending for conservation programs by \$6.5 billion over 10 years (Agriculture Reform, Food, and Jobs, 2012). The bill also folded in four current standalone conservation programs under the EQIP umbrella. The Senate proposal authorized only \$1.5 billion in 2013 for the expanded EQIP (Chite, 2012), even though spending reached \$2.3 billion both in 2011 and in 2012 (Fiscal Year 2013 Appendix Budget, 2012). As Figure 1 shows, spending historically outpaced authorizations. This is because two of the programs, WRP and GRP, were based on acres protected rather than limited by a dollar amount. (See Appendix 2.) The Senate proposal eliminates this acres cap and instead requires that all programs be limited to the \$1.5 billion budget. Consequently, spending for the expanded EQIP would drop by nearly a billion dollars in 2013 alone.

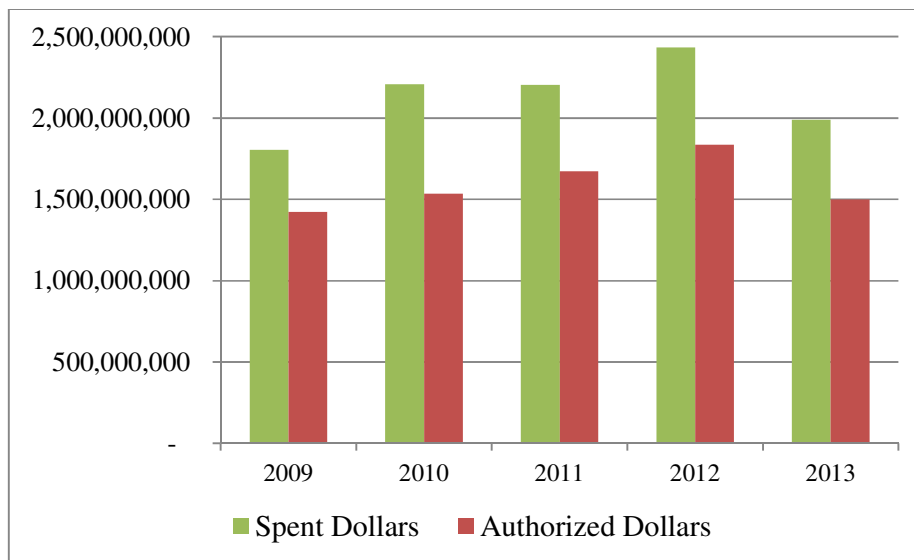


Figure 1: Spent Dollars vs. Authorized Dollars for expanded EQIP

¹2012 and 2013 spending amounts are estimates. 1997-2011 are actual amounts spent.

Sources: Fiscal Years 2011-2013 Appendix Budgets, The 2008 Farm Bill: Major Provisions and Legislative Action, The Senate Agriculture Committee’s 2012 Farm Bill (S. 3240): A Side-by-Side Comparison with Current Law

b. An Alternative to Regulation

Congressional testimony from 1998 reveals that many lawmakers not only viewed EQIP as a preferable alternative to potential new regulation, but also believed that the existence of the program should stop attempts by the EPA to overregulate agriculture, especially livestock. Addressing the Subcommittee on Forestry, Resource Conservation and Research, Chairman Larry Combest (R-TX) said, “While I strongly believe that this is the right approach, I know that there are some who would push for greater controls through increased regulation. In order to preempt this move, we must be able to tell of the successes that are resulting through our efforts in programs such as EQIP,” (Hearing Before the Subcommittee on Forestry, 1998, p.2).

Even so, early distrust of EQIP was widespread. Many feared that EQIP would require farmers to pay for costly new conservation upgrades instead of sharing in the costs of these improvements as promised. A letter to Congress from the California Cattleman's Association claimed that ranchers "have seen plenty of voluntary programs in the past that have evolved into mandatory regulations," and expressed the view that the "so-called 'voluntary' EQIP program is really a wolf in sheep's clothing, with the benefit to a landowner showing up as an expense on a profit-and-loss statement at the end of the year," (Hearing Before the Subcommittee on Forestry, 1998, p.49). Likewise, Representative Bill Bartlett (R-NE), Vice Chairman of the Subcommittee on Forestry, Resource Conservation and Research reported that farmers in his home state of Nebraska have identified EQIP as the "stealth conservation program," (Hearing Before the Subcommittee on Forestry, 1998, p.5).

These fears gained legitimacy when a failure to properly estimate demand forced EQIP to reject the majority of funding applications in its first year of operation. Although the failure to meet application demand is a different issue than the prospect of potential new regulation, many farmers equated the two issues. Many feared that EQIP would make lawmakers more amenable to new regulation because the program was designed to ease the burden of regulation on farmers. However, if in reality, the funds were not actually available (as evidenced by the rejected applications) then EQIP could possibly lead to increased regulation without the promised increased assistance to farmers.

The story of Don and Sara Massey, a couple who owned and operated two small dairy farms in Texas, exemplified the problem (Hearing Before the Subcommittee on Forestry, 1998). In a letter to Congress, the couple explained that they were routinely fined for failing to build a new waste management system on one of their farms:

We, like all Texas dairy farmers, have been hard hit for the past few years, and there is simply not extra money with which to build another system. Needless to say when we began reading in all of the magazines and newspapers about EQIP, and how it was to be allocated, we thought that we were finally going to be eligible for some help... We were one of the first to make application in our county, but our application was denied (Hearing Before the Subcommittee on Forestry, 1998, p.55).

The failure to properly gauge demand in the program's early years turned many of those EQIP was designed to benefit against it. Only about 38 percent of applications were approved in 1997 (Hearing Before the Subcommittee on Forestry, 1998). In total, over 37,000 applications for funds were rejected. Many farmers blamed EQIP for providing false hope. Early disappointments such as these underscore the importance of EQIP funding in assisting producers with the task of regulatory compliance at both state and federal levels.

c. Allocation of Funding to States

EQIP faced questions about its funding allocations from the very start. In 1998, Representative Calvin Dooley (D-CA) asserted, "From a California perspective, we can't help but be a little troubled in terms of the actual dollar amounts that we're receiving relative to a number of other States, obviously, our State by far and away being the leading

agriculture State in the Nation,” (Hearing Before the Subcommittee on Forestry, 1998, p.17). Initially, in 1997, state allocations were constrained by historical funding patterns. In 1998 the constraint was removed.

The 2002 Farm Security and Reinvestment Act allocated extra funding to states that received less than \$12 million annually in order to ensure regional equity. This regional equity provision had a number of unintended consequences. First, states were allocated this money regardless of actual need. In written testimony, Arlen Lancaster, then Chief of the NRCS explained, “More than \$120 million in EQIP funding has been diverted from the natural resource state allocation formula process and directed to certain States. This movement of funds has occurred regardless of the relative natural resource need, producer interest and demand in programs, or local agency staff capacity,” (Hearing Before the Committee on Agriculture, 2007, p.82). In light of the overwhelming demand for EQIP funding in some states, it seemed illogical to increase allocations to other states where the level of demand simply did not compare.

Second, some states handled their abundance of funding by simply increasing the state’s portion of cost-share percentages even though such increases may not have had an effect on producer participation rates (Hearing before the Committee on Agriculture, 2007). Lancaster explained, “Within our regional equity States, many of those cost-share rates are up near the cap. They are near 75 percent. Other States, the cost-share rate again is dipping down to 50 percent or more. There are many instances where producers would accept a lower level of cost-share to implement those practices and we can allow those dollars to stretch further as well,” (Hearing Before the Committee on Agriculture, 2007, p. 24). The regional equity clause was working in direct opposition to the stated mission of optimizing benefit per dollar spent. In 2008, the regional equity threshold was increased to \$15 million (Johnson, 2008). The current Senate proposal eliminates the dollar threshold, but requires each state to be awarded at least .6 percent of total funding if they can establish that they can use it (Chite, 2012). In addition, NRCS moved to regional cost-share rates to address the disparity of rates between states.

d. The Funding Formula Mechanism

Until 2012, the structure of the funding allocation formula had remained relatively unchanged. An interagency team determined factors of importance and then weighted each of these factors by conservation priority. As Craig Cox, acting USDA Deputy Under-Secretary for Natural Resources and Environment, clarified before Congress, “[The weights] do give some sense of priority to a particular element that’s in a formula. Consequently, a weight of 6.5 in 1997 would mean that [a factor] would be significantly different in terms of its impact on allocations than say [another factor], which is at .8,” (Hearing Before the Subcommittee on Forestry, 1998, p.18). This means that factors that were considered to be more important were given a higher weight within the formula. The factors were then multiplied by their weights and summed to determine each state’s rank. Funding dollars were allocated to states based on the rankings.

While the formula's structure remained consistent, the actual factors of importance and their corresponding weightings changed over time to reflect evolving priorities. Both in 1997 and in 1998 there were 27 factors of importance (Hearing Before the Subcommittee on Forestry, 1998). Most of these factors were related to cropland and livestock concerns as mandated by statute. The largest benefactors of these allocation decisions were water quality and soil conservation initiatives. Water quality initiatives received 56 percent of funding while soil conservation received 23 percent (Hearing Before the Subcommittee on Forestry, 1998). Water quantity concerns received an additional 11 percent. It's important to note that even in the first two years, some factors were removed and some were added.

In addition to the factors of importance, NRCS "held back \$10 million or 5 percent of the program for incentive bonuses to States. These incentive grants are designed to encourage States to do a better job of running the locally-led process of working with partners and so forth," (Hearing Before the Subcommittee on Forestry, 1998, p.21). The incentive grants were eventually replaced by new factors capturing the same information.

By 2005, concerns had arisen that the formula used to distribute EQIP funds to the states was not fundamentally sound. In 2006, the Government Accountability Office (GAO) released an analysis of the relationship between environmental benefit and funding in a report entitled USDA Should Improve Its Process for Allocating Funds to States for the Environmental Quality Incentives Program. The GAO determined that allocation for EQIP was "not clearly linked to EQIP's purpose of optimizing environmental benefits," (Government Accountability Office, 2006, p.3). In addition, the report concluded, "NRCS may not be directing EQIP funds to states with the most significant environmental concerns arising from agricultural production," (Government Accountability Office, 2006, p.3).

Specifically, the GAO questioned the basis behind the inclusion of certain factors in the funding formula. The agency found that NRCS could provide no "specific, documented rationale" for the inclusion of each factor (Government Accountability Office, 2006, p.2). For example, the report questioned why a factor was included for the waste management of small animal feeding operations, but no similar consideration was given to large animal feeding operations (Government Accountability Office, 2006). Likewise, why did the formula account for impaired rivers and streams, but not for impaired lakes? There was a lack of transparency and understanding of the how the allocation formula criteria were defined (P. Gilbreath, personal communication, October 30, 2012).

In addition, the report failed to understand why equal weight was placed on the availability of natural resources in a state and on the presence of environmental problems in a state. "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," (Government Accountability Office, 2006, p.14). The GAO referenced interviews with stakeholders who believed placing more weight on the presence of environmental problems would more closely align EQIP funding with its goals. A "reassignment of weights would better ensure that states contending with the most significant

environmental problems receive the most funding,” the report stated (Government Accountability Office, 2006, p.14).

Second, the GAO criticized NRCS’ inability to document how it assigned weights to each factor. This was of particular concern as the impact of even a 1 percent shift in the funding equation from one factor to another amounted to a \$6.5 million shift in funding allocations (Government Accountability Office, 2006). For example, the report found that:

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 importance of having a well-founded rationale for assigning them. To date, NRCS has not documented its rationale for choosing the weights (Government Accountability Office, 2006, pp.13-14).

The report also pointed to a discrepancy between the total weight of animal feeding operation factors and the percentage of funds actually spent in 2005 on the construction of waste management systems for these operations. States directed 11 percent of funds on animal feeding operations even though NRCS weighted these concerns at only 6.3 percent. The 4.7 percent discrepancy means that NRCS underestimated demand for conservation practices related to animal feeding operations by over \$30 million.

GAO also cited more fundamental concerns over the quality of data inputted into the funding formula. When questioned, NRCS could not provide data sources for 10 of the 31 factors. “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,” (Government Accountability Office, 2006, p.17). Among the missing data sources were acres of federal grazing land, miles of impaired streams and rivers, and livestock animal units. In addition to missing data sources, some sources were used more than once for different factors, perhaps giving these sources undue weight (Government Accountability Office, 2006). For example, NRCS used the same data source to estimate pesticide and nitrogen runoff as it used to estimate phosphorus runoff. This decision was made because the agency did not have access to data on phosphorus 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 offsite to cause environmental problems are different from those of phosphorus,” (Government Accountability Office, 2006, p.16). Consequently, by using the same data source for each, NRCS eliminated the effects of phosphorus runoff from its

considerations and assigned more weight to the effects of pesticide and nitrogen runoff than it had intended to.

Finally, some of the factors used outdated data sources. GAO found more recent data for six of the factors than was used (Government Accountability Office, 2006). In addition, data on land erosion was over 20 years old. The report asserted, “Not using recent data raises questions about whether the formula allocates funds to the 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,” (Government Accountability Office, 2006, pp.18-19). The combination of missing, double counted, and outdated data sources put into question both the legitimacy and validity of funding allocations.

In the 2006 GAO report, there was emphasis placed on NRCS’s need to take steps to ensure that the EQIP funding allocation formula be based on the success of completing long-term performance measures. GAO noted a disconnect between NRCS EQIP performance measures and the funding allocation process that needed to be addressed (P. Gilbreath, personal communication, October 30, 2012).

At the end of fiscal year 2011, for the first time, there was a move away from the formula funding mechanism and toward a more locally-led and performance-based approach that would better identify the highest priority lands in each state. This new approach was to be manifested in the completion of a State Resource Assessment [SRA]. The first SRA for each state was to serve as the funding allocation tool for EQIP starting in FY 2012. It was planned that the SRA process would be tasked for completion every three years. While it seems the SRA funding allocation tool improves on the formula mechanism in a number of ways, by nature, any assessment of conservation needs will be based on a number of set criteria and their weighted importance, and so will retain the characteristics of a formula in most ways. The way in which the SRA serves as a formula allows states to designate criteria and their respective weights most relevant to actual conservation concerns in that state. This is in contrast to the past formula allocation tool which used the same weighted criteria for the entire United States.

State resource assessments were spurred in part by the 2006 GAO report and also by certain state conservationists that began to ask for a more ‘ground up’ approach (K. Cerretani, personal communication, November 14, 2012). The development of the State Resource Assessment mechanism is all about trying to integrate budget and performance, and holding states accountable. The goal of SRAs is to marry priority needs with the budget planning cycle (K. Cerretani, personal communication, November 14, 2012). Additionally, the hope is that SRAs will help money get to where it’s really needed as early as possible in the fiscal year (K. Cerretani, personal communication, November 14, 2012).

While there seems to be overwhelming support for the move toward the use of SRAs, their introduction has come with a few hiccups. It was required that each state use the National Land Cover Dataset [NLCD], a geodata product from USGS, for making an assessment of the state’s conservation needs (M. Flint, personal communication, October 26, 2012). The

requirement to use a nationally available dataset caused some dissatisfaction among state offices because the NLCD land classification didn't exactly coincide with land use designation that NRCS uses for all of its accountability and planning work (M. Flint, personal communication, October 26, 2012). In some cases, assumptions had to be made which may have altered the accuracy of evaluating the state's conservation needs (M. Flint, personal communication, October 26, 2012). Additionally, the time in which state offices were provided to complete the FY 2011 SRAs was so short that it made collaboration with other agencies or conservation partnerships, that could help attain the best assessment of priority needs, infeasible (S. Zezula, personal communication, February 21, 2013).

e. The Role of Technical and Educational Assistance

1996's Freedom to Farm Act empowered NRCS to provide technical assistance to farmers by determining eligible conservation practices and by developing plans for implementation on individual farms. In 1998, 19 percent of EQIP funding went to technical assistance while 2 percent went to educational assistance (Hearing Before the Subcommittee on Forestry, 1998).

Jim Ham, President of the Georgia Association of Conservation District Supervisors explained the importance of technical assistance in a 2007 Congressional hearing, "Funding for technical assistance allows NRCS employees to meet face-to-face with landowners, visit their operation and help them design strategies for the resource needs of individual agricultural operations," he said (Hearing Before the Committee on Agriculture, 2007, p.38). Likewise, in an earlier hearing, Craig Cox, acting USDA Deputy Under-Secretary for Natural Resources and Environment, emphasized, "Most of the good that we do in NRCS comes from technical assistance, not from financial assistance. Most of the progress that we make and most of the resource conservation we put on the ground is done in the absence of any cost sharing assistance," (Hearing Before the Subcommittee on Forestry, 1998, p.27).

Freedom to Farm also tasked NRCS with providing conservation education to producers both participating and not participating in the program. Cox believed that educational programs enabled farmers to make "informed decisions" about conservation. "In many instances, an investment in education results in the implementation of conservation practices without the need for financial or technical assistance, thereby helping to maximize the environmental benefits per program dollar" (Hearing Before the Subcommittee on Forestry, 1998, p.70). The benefits of conservation education are really several-fold. Visits by NRCS field staff to farms in need of assistance allow for the identification of priority concerns and in-person conversations with producers about the visit (S. Zezula, personal communication, February 21, 2013). Without these visits by field staff, past experience has shown that situations arise in which EQIP contracts may be written up for the wrong practice (i.e., a practice not causing the conservation concern) (S. Zezula, personal communication, February 21, 2013). Once field staff arrive at the farm, the mistake is realized and corrected, but only after a great deal of paperwork and wasted staff time (S. Zezula, personal communication, February 21, 2013).

Despite their multiplicative nature and cost effectiveness of technical and educational assistance over payments to farmers, both fell out of favor over time. By 2006, funding for

educational assistance had been completely eliminated, and although payments to farmers and ranchers had tripled since 1985, funding for technical assistance had stayed the same. (Government Accountability Office, 2006; Hearing Before the Committee on Agriculture, 2007). “The advent of such large financial assistance programs has been in a sense a double-edged sword. It has given us money we never could have dreamed of 20 years ago when I was in the field. But the financial assistance has tended to overshadow the fundamental importance of technical resources and knowledge, and most of our policy attention has followed that focus toward talking about financial assistance programs,” Cox testified (Hearing Before the Committee on Agriculture, 2007, p.42).

In 2007, Cox recommended increasing funding for technical assistance only contracts, otherwise known as Conservation Assistance Plans [CAPS] (Hearing before the Committee on Agriculture, 2007). Without an increase in technical assistance funding, Cox warned, “I have no doubt that the administrative tasks of writing contracts and cutting checks to get money out the door will in fact be accomplished... but I have serious and growing doubts about whether the scientific and technical support will be there to make those checks meaningful for both producers and the environment,” (Hearing Before the Committee on Agriculture, 2007, p.31).

Often NRCS can manage EQIP only on a first come, first served basis. As a result, many of the farmers with the most significant resource issues aren't the ones coming in the door (S. Zezula, personal communication, February 21, 2013). Mindsets are difficult to change, and outreach and workshops may not be enough. The State Resource Assessment mechanism offers a great opportunity to identify these areas and connect with the individuals who manage them (S. Zezula, personal communication, February 21, 2013). For most of those who don't come to NRCS for help on their own, the concern is that conservation will be too difficult. To achieve conservation on the lands of these producers, the main focus should be on building trust and nurturing a relationship, but that's a time intensive investment of NRCS technical assistance resources (S. Zezula, personal communication, February 21, 2013). In many circumstances, it might be the case that farmers want technical help more than they want financial assistance (S. Zezula, personal communication, February 21, 2013).

As of 2013, there has been no movement by legislators to increase funding for technical assistance or to reinstate funding for educational programs.

f. Funding Carve-Outs and Mandates

Beginning with the mandatory funding for concerns related to livestock, legislators have created a number of EQIP carve-outs or subprograms since its creation. Cox explained the rationale behind these in testimony before Congress, “Special projects do two important things. First they get producers working together to achieve the critical mass needed in a particular location to really make a difference on the ground. Second, they allow us to take advantage of new science and new tools to focus our efforts where they will do the most good” (Hearing before the Committee on Agriculture, 2007, p.57). Appendix 1 has a full breakdown of funding for subprograms since inception.

The Farm Security and Reinvestment Act of 2002 created a new ground and surface water conservation program [GSWCP] for high plains aquifer and western drought states. In addition, two regional priorities, the Colorado and Klamath River basins, were named under the EQIP umbrella.

In the Food, Conservation, and Energy Act of 2008, lawmakers replaced GSWCP with the new Agricultural Water Enhancement Program [AWEP]. The new subprogram targeted the following seven priority regions: the Eastern Snake Plain Aquifer region, the Puget Sound, the Ogallala Aquifer, the Sacramento River watershed, the Upper Mississippi River Basin, the Red River of the North Basin, and the Everglades (Johnson, 2008). The Senate also proposed an additional Chesapeake Bay carve out, but instead, a new conservation program not under EQIP was created for the region (Johnson, 2008).

Regional priorities can have a large impact on funding allocations to states. For example, in 2006, the top ten states receiving EQIP funds in most to least order were Texas, California, Colorado, Minnesota, Montana, Kansas, Oklahoma, Arizona, Iowa, and Utah (Government Accountability Office, 2006). A large piece of Colorado and Utah's total funding was the \$9.7 million each received under the Colorado River subprogram. Although North Carolina ranked 19th in general funding assistance, it ranked 27th in overall total funding when taking into account carve-outs for special projects (Government Accountability Office, 2006).

In its 2012 proposal bill, the Senate again looked to overhaul EQIP's subprograms. The bill folded in four current standalone conservation programs. First, the Wildlife Habitat Incentive Program [WHIP] would be replaced by a mandate of 5 percent of EQIP funds to be spent on the protection of wildlife habitats, similar to the livestock carve-out (Chite, 2012). Second, as stated previously, the Wetlands Reserve Program [WRP], the Grasslands Reserve Program [GRP], and the Farm and Ranch Land Protection Program [FRLP] would be consolidated into the new Agricultural Conservation Easement Program [ACEP] subprogram (Chite, 2012). Historical authorizations for these four programs can be found in Appendix 2. Two of the consolidated programs, WRP and GRP, do not have spending authorizations. Instead their baselines are determined by maximum acreage allowed to be conserved.

g. Congressional and Political Barriers

There is often an apparent rift between two different schools of thought within Congress on conservation issues related to agriculture. Agriculture committees often behave as insular institutions with a certain set of agricultural productivity goals in mind. This group is contrasted by those within Congress advocating for more broadly defined conservation goals which place more emphasis on the environmental quality of land and waterways affected by agricultural production (C. Cox, personal communication, February 26, 2013).

An even more fundamental political barrier, which extends way beyond agriculture committees, is the political difficulty in designing a policy mechanism that awards money to some while denying it to others. This challenge can get in the way of really targeting funds at the congressional level (C. Cox, personal communication, February 26, 2013).

For those who subscribe to the school of thought focusing on a broader definition of conservation, a focus on the rule-making process has been an important alternative avenue for overcoming many of the congressional and political barriers which exist for achieving the greatest improvements in conservation around the U.S (C. Cox, personal communication, February 26, 2013). After legislation is passed, tremendously important decisions are made by agencies in the rules they write which govern federal programs and provide detail on how decisions will be made and priorities set (C. Cox, personal communication, February 26, 2013). Trying to shape what programs will ultimately look like through rulemaking can often have remarkable influence on the operation and performance of a program (C. Cox, personal communication, February 26, 2013).

IV. QUANTITATIVE ANALYSIS

a. EQIP Dollars Analysis (FY 2009-2011)

According to EQIP funding allocation results from Fiscal Year 2009 to 2011 (see Appendix 5), North Carolina received \$14,394,842.69 in FY 2009; \$13,545,968.19 in FY 2010; and \$17,543,566.00 in FY 2011, respectively. Overall, North Carolina ranks near the middle among all 48 continental states, receiving approximately a 2% proportion of the total available EQIP funding. Alaska and Hawaii were excluded from our analysis due to their unique needs. A more detailed comparison is shown in Table 1 below.

Table 1. EQIP Allowance for North Carolina (FY 2009-2011)

| | FY 2009 | FY 2010 | FY 2011 |
|-----------------------|----------------|----------------|----------------|
| EQIP Allowance (US\$) | 14,394,842.69 | 13,545,968.19 | 17,543,566.00 |
| Percentage (%) | 1.93 | 1.62 | 2.03 |
| Rank | 23 | 26 | 17 |

b. Formula Analysis

- ***Overview of the EQIP Formula***

According to Fiscal Year 2009 Allocation Formulas and Methodologies from the NRCS, the development of ranking criteria for evaluation and selection of applications is based on the degree of cost-efficiency of the proposed conservation practices, the magnitude of the environmental benefits, the treatment of multiple resource concerns, the use of conservation practices that provide environmental enhancements for a longer period of time, compliance with Federal, State, local or tribal regulatory requirements, and other locally defined pertinent factors such as the location of the conservation practice, the extent of natural resource degradation, and the degree of cooperation by producers to achieve environmental benefits.

In order to reasonably allocate the EQIP funding, a formula was developed to grade the situation of each state, which includes a series of factors addressing resource and

environmental concerns. In the FY2009 formula, funding allocation factors were weighted using a paired comparison approach. This was different from the mechanism used to assign weights of previous formulas which used a leadership selection process originating from program manager recommendations. A comprehensive rank order of the FY2009 formula factors was developed according to the averaged result from the Leadership Team, Programs Advisory Board, and the EQIP NHQ Team. Major breaks in the averaged scores were used to identify groupings of high, medium, and low factors. Weights were assigned to each of the groupings with factors at the top of the rank order receiving the highest weight, medium ranked factors receiving a moderate weight, and low ranked factors receiving a low weight. However, a factor (Farm and Ranches) was added after paired comparison evaluation which may have created some discrepancy between the paired comparison percentages and the final formula percentages because of its addition late in the allocation cycle. Table 2 shows the original EQIP allocation formula which includes 20 factors belonging to four categories, and the weight of each factor.

Table 2. EQIP FY 2009 Formula Factors (Financial Assistance)

| Financial Assistance | Weight |
|---|----------------|
| A) Resource Base Factors | |
| Farms and Ranches (no.) | 5.00% |
| Forest Land (ac.) | 5.00% |
| Grazing Land (1,000 ac.) | 9.50% |
| Irrigated Cropland (ac.) | 9.50% |
| Livestock Animal Units (no. of AUEs) | 9.50% |
| Non-Irrigated Cropland (ac.) | 9.50% |
| Non-Traditional Participants (Index) | 5.00% |
| Specialty Crop Farms (no.) | 5.00% |
| Tribal Trust Land (ac.) | 1.00% |
| B) Resource Quality Factors | |
| Air Quality Non-Attainment Areas (index) | 1.00% |
| At-Risk Species (no.) | 5.00% |
| Cropland Eroding Above "T" (Soil Loss Tolerance) (1,000 ac.) | 9.50% |
| Impaired Streams 2007 (index) | 9.50% |
| Wetlands (1,000 ac.) | 6.00% |
| C) Cost of Doing Business Factors | |
| Cost of Doing Business (USACE index) | 5.00% |
| D) Performance Factors | |
| Comprehensive Nutrient Management Plans (CNMPs) Applied (no.) | 0.90% |
| Cost-effectiveness (ac./million dollars) | 0.90% |
| National Priorities (index) | 1.50% |
| Timely Practice Implementation (%) | 1.50% |
| Technical Service Providers (TSP) Implementation (ratio) | 0.20% |
| Total | 100.00% |

- *Baseline EQIP Formula Estimates*

Based on the EQIP allocation formula, we developed our own baseline for the research and analysis of EQIP funding allocation on the national level (Table 3). We basically maintained the factors used in the original formula, but made some changes based on the importance and representativeness of factors and data availability:

1. In the baseline, we left out the factor “Non-Traditional Participants (Index)” with weight of 5%. The definition of this factor includes three measurements: beginning farmers or ranchers, socially disadvantaged producers, and limited resources producers. This factor was designed to measure the equity and fairness of EQIP which is of more political and social importance than resource management that we’re concerned with.
2. Another factor we decided to delete is “Tribal Trust Land (ac.),” which is defined as total acres of Trust Lands for which the U.S. holds title in trust for the benefit of a tribe or for an individual Indian. This factor does not reflect environment-related issues and has a relatively small weight of 1%, so we decided to leave it out and redistribute its weight to other factors.
3. We used “Cropland Eroding Rates (tons per ac. per year)” to replace the factor “Cropland Eroding Above ‘T’ (Soil Loss Tolerance) (1000 ac.)” because of no access to the data source. This new factor includes erosion from both water and wind on cropland.
4. We left out all the Performance factors including “Comprehensive Nutrient Management Plans (CNMPs) Applied (no.),” “Cost-effectiveness (ac./million dollars),” “National Priorities (index),” “Timely Practice Implementation (%),” and “Technical Service Providers (TSP) Implementation (ratio).” The values of these factors are determined by the performance of EQIP funding utilization received by each state in previous years and are not relevant in our assessment of current environmental and resource management needs. Also, because of their small proportion of weight and data unavailability, we decided to exclude them from our baseline, but we discuss them again later in other scenarios.
5. There are two sections of EQIP: financial assistance and technical assistance. In the baseline we developed, we were only interested in financial assistance since that’s the EQIP component most directly related to environmental and resource quality factors.
6. According to the original EQIP formula and changes we made, we selected 13 factors to use in our baseline. Since several factors were left out from the formula, we increased the weight of each factor proportionally. Therefore, the baseline is shown in the table below:

Table 3. Baseline of EQIP Formula Analysis

| Financial Assistance | Weight |
|--|----------------|
| Grazing Land (1,000 ac.) | 10.67% |
| Irrigated Cropland (ac.) | 10.67% |
| Livestock Animal Units (no. of AUEs) | 10.67% |
| Non-Irrigated Cropland (ac.) | 10.67% |
| Cropland Eroding Rates (tons per ac. per year) | 10.67% |
| Impaired Streams 2007 (index) | 10.67% |
| Wetlands (1,000 ac.) | 6.74% |
| Farms and Ranches (no.) | 5.62% |
| Forest Land (ac.) | 5.62% |
| Specialty Crop Farms (no.) | 5.62% |
| At-Risk Species (no.) | 5.62% |
| Cost of Doing Business (USACE index) | 5.62% |
| Air Quality Non-Attainment Areas (index) | 1.12% |
| Total | 100.00% |

An in-depth analysis of each factor, explanations for adopting the factor in the EQIP formula, and dated sources are attached in Appendix 6. The raw data of each factor are shown in Appendix 7. In order to calculate the value of each state according to the baseline formula, we need to sum up the results of each factor times its weight. Because the values of different factors are in different orders of magnitude, we normalized the data to total, which means dividing the value of each state of a factor by the value of the U.S. of that factor. Then we change all the numerical values of each factor into percentages. The results of normalization are shown in Appendix 8.

Based on the baseline and the data above, we were able to calculate the value of each state. The results are shown in Table 4. The calculation results indicate that North Carolina ranks No. 14 among all the states, with a proportion of 2.43%. In this case, it means that if EQIP funding was allocated only by the baseline formula, North Carolina's allowance would account for 2.43% of total funding, ranking No. 14 among the 48 states. However, the actual EQIP money North Carolina got from FY 2009 to 2011 was less than this result, and the rank was lower as well.

Table 4. Baseline Calculation Results and Comparison by State

| Rank | State | Baseline Calculation Result | Baseline Percentage | FY2011 Actual Percentage | Difference (Baseline-FY2011) |
|------|----------------|-----------------------------|---------------------|--------------------------|------------------------------|
| 1 | Texas | 7.59 | 7.60 | 9.86 | -2.26 |
| 2 | California | 5.34 | 5.35 | 8.60 | -3.25 |
| 3 | Pennsylvania | 3.82 | 3.83 | 1.57 | 2.26 |
| 4 | Nebraska | 3.54 | 3.54 | 2.62 | 0.92 |
| 5 | Minnesota | 3.32 | 3.32 | 2.79 | 0.53 |
| 6 | Iowa | 3.23 | 3.23 | 2.90 | 0.34 |
| 7 | Kansas | 3.13 | 3.13 | 2.70 | 0.43 |
| 8 | Florida | 3.02 | 3.02 | 2.06 | 0.96 |
| 9 | Washington | 2.71 | 2.71 | 1.53 | 1.18 |
| 10 | Montana | 2.68 | 2.68 | 2.30 | 0.38 |
| 11 | Colorado | 2.64 | 2.64 | 3.05 | -0.41 |
| 12 | Georgia | 2.56 | 2.56 | 1.66 | 0.90 |
| 13 | Michigan | 2.54 | 2.54 | 1.83 | 0.70 |
| 14 | North Carolina | 2.43 | 2.43 | 2.03 | 0.41 |
| 15 | Missouri | 2.40 | 2.40 | 3.41 | -1.01 |
| 16 | Indiana | 2.38 | 2.38 | 2.22 | 0.17 |
| 17 | New Mexico | 2.29 | 2.29 | 2.55 | -0.26 |
| 18 | Arkansas | 2.27 | 2.27 | 3.11 | -0.84 |
| 19 | Oklahoma | 2.25 | 2.25 | 2.60 | -0.35 |
| 20 | Ohio | 2.22 | 2.22 | 1.38 | 0.84 |
| 21 | Illinois | 2.21 | 2.21 | 1.39 | 0.83 |
| 22 | Oregon | 2.08 | 2.08 | 1.82 | 0.26 |
| 23 | Wisconsin | 2.05 | 2.05 | 1.85 | 0.20 |
| 24 | South Dakota | 1.99 | 1.99 | 1.86 | 0.13 |
| 25 | Arizona | 1.99 | 1.99 | 1.95 | 0.04 |
| 26 | North Dakota | 1.95 | 1.95 | 2.07 | -0.12 |
| 27 | Alabama | 1.95 | 1.95 | 1.79 | 0.15 |
| 28 | Mississippi | 1.83 | 1.83 | 3.11 | -1.27 |
| 29 | Tennessee | 1.82 | 1.82 | 1.32 | 0.50 |
| 30 | Louisiana | 1.81 | 1.81 | 1.82 | -0.01 |
| 31 | Kentucky | 1.78 | 1.78 | 1.30 | 0.48 |
| 32 | Virginia | 1.72 | 1.72 | 1.37 | 0.35 |
| 33 | New York | 1.63 | 1.64 | 1.52 | 0.11 |
| 34 | Idaho | 1.55 | 1.55 | 1.62 | -0.07 |
| 35 | South Carolina | 1.40 | 1.40 | 1.00 | 0.39 |
| 36 | Wyoming | 1.24 | 1.24 | 1.69 | -0.45 |
| 37 | Utah | 1.24 | 1.24 | 1.89 | -0.65 |
| 38 | New Jersey | 0.95 | 0.95 | 0.59 | 0.36 |
| 39 | Maine | 0.94 | 0.94 | 1.23 | -0.30 |
| 40 | West Virginia | 0.89 | 0.89 | 0.82 | 0.07 |
| 41 | Nevada | 0.76 | 0.76 | 0.93 | -0.17 |
| 42 | Maryland | 0.75 | 0.75 | 0.74 | 0.01 |
| 43 | New Hampshire | 0.73 | 0.73 | 0.41 | 0.32 |
| 44 | Massachusetts | 0.62 | 0.62 | 0.76 | -0.13 |
| 45 | Connecticut | 0.57 | 0.57 | 0.67 | -0.10 |
| 46 | Vermont | 0.43 | 0.43 | 1.10 | -0.67 |
| 47 | Delaware | 0.41 | 0.41 | 0.56 | -0.15 |
| 48 | Rhode Island | 0.33 | 0.33 | 0.37 | -0.04 |

The parallel graph below (Figure 2) is drawn for comparison analysis. The majority of baseline formula calculation results (>86%) are consistent with the EQIP funding allocation, demonstrating the capacity of the baseline formula to replicate the original EQIP formula. It has been found that states with “surplus allocation” that is, higher financial assistance allocated than the baseline calculation results, also rank high in the actual EQIP allowances (states in Group 1 shown in Table 5 below), raising the issue of equity of funding allocation among states, which is addressed in scenario 1.

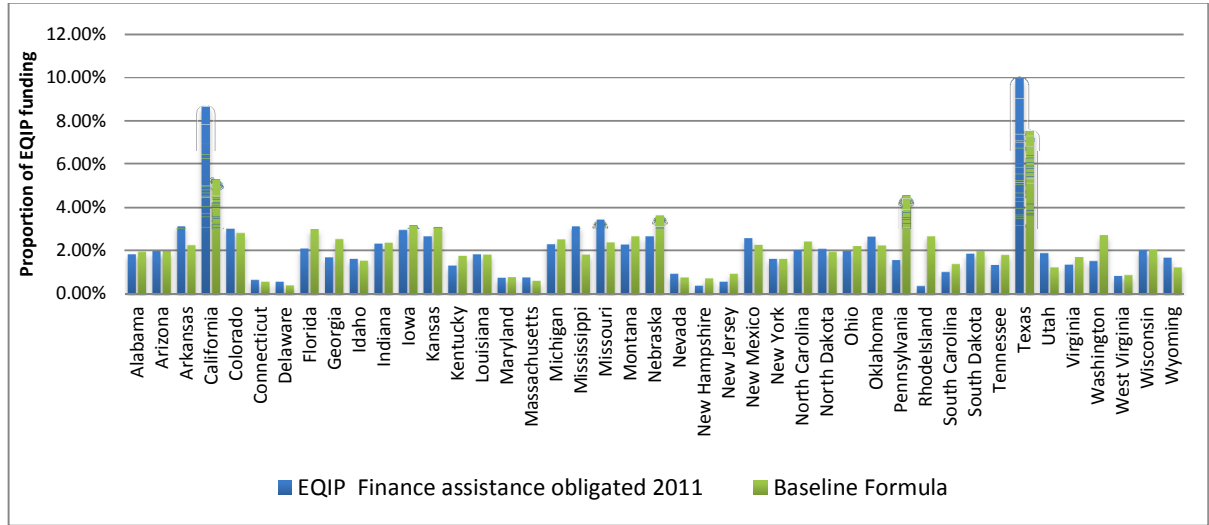


Figure 2: Comparison of the EQIP Funding Proportion Between Baseline Formula Results and EQIP Funding Granted (2011)

Table 5. Discrepancies Between EQIP Financial Assistance Obligated in 2011 and Baseline Formula Calculations

Group 1 States with obligated financial assistance higher than the baseline formula calculations

Group 2 States with obligated financial assistance lower than the baseline formula calculations

| | State | EQIP Financial Assistance to the total (%) | Financial Assistance Amount Rank | Financial Assistance Funding Amount (\$) | Ranking : EQIP Funding | Differences EQIP% - Baseline% |
|---------|--------------|--|----------------------------------|--|------------------------|-------------------------------|
| Group 1 | California | 8.60 | 2 | 74407856.00 | 2 | 0.03 |
| | Texas | 9.86 | 1 | 85322032.00 | 1 | 0.02 |
| | Mississippi | 3.11 | 5 | 26876689.00 | 5 | 0.01 |
| | Missouri | 3.41 | 3 | 29512639.00 | 3 | 0.01 |
| | Arkansas | 3.11 | 4 | 26895367.00 | 4 | 0.01 |
| Group 2 | Georgia | 1.66 | 27 | 14384952.00 | 27 | (0.01) |
| | Illinois | 1.39 | 34 | 12004563.00 | 32 | (0.01) |
| | Florida | 2.06 | 16 | 17837374.00 | 16 | (0.01) |
| | Nebraska | 2.62 | 10 | 22700598.00 | 10 | (0.01) |
| | Washington | 1.53 | 32 | 13229797.00 | 30 | (0.01) |
| | Pennsylvania | 1.57 | 31 | 13547291.00 | 29 | (0.03) |

c. Scenario Analysis

In response to expected changes of the new Farm Bill made to increase the efficiency of EQIP, in the scenario analysis, we added/ deleted environmental factors as well as made adjustments to corresponding weighted factors in order to examine the funding mechanism of EQIP financial assistance, quantify the leverage of main components in the EQIP formula, and to see how these changes effect the funding ranking among states with a special attention given to North Carolina in the last part of the scenario analysis.

Scenario 1: Environmental Equity with Conservation Programs

There are 15 programs under the 2008 NRCS Farm Bill Conservation Program, including EQIP. These programs address priority environmental goals and provide conservation opportunities for farmers and ranchers (see Appendix 9). As discussed above, the EQIP allocation factors reflect several important aspects of agricultural issues and environmental goals, such as water quality and land use management, however, other conservation programs also address the same issues. Therefore, there might be concerns about environmental equity among states since some may receive superfluous funding due to more than one program addressing the same conservation priority. The first scenario is used to compare and analyze the environmental equity of the funding allocation among states with the existence of duplicate factors among different conservation programs.

Because water and land conservation are the two crucial aspects of our research, conservation programs addressing these two aspects are picked out and listed in Appendix 10, showing the allocation money of each state and their percentages among all the states in FY 2011. Based on these results, it seems evident that several states received the large proportion of funds from both EQIP and other conservation programs—a result that may indicate environmental inequity among states. For instance, California got 8.60% of EQIP funding, almost four times what North Carolina received, but was still allocated 30.67% of Agricultural Water Enhancement Program funding and 6.67% of Wetlands Reserve Program funding. It should also be noted that the weights of water and land conservation factors combined account for over 60% of the EQIP allocation formula.

The comparison between EQIP funding of each state and funding from other conservation programs in FY 2011 is illustrated in Scenario 1. Due to limited data accessibility, we include AMA, AWEP, CBWI, CSP, FRPP, GRP, HFRP, WRP, and WHIP. Detailed information is shown in Table 6 below. In FY 2011, North Carolina ranked No. 17 in the EQIP allocation funding it received, while it ranked only No.31 in allocation funding it received from all other conservation programs combined. In all, we determined that North Carolina received only 1.48% of all the funding allocated. However, California and Texas both rank No. 1 in one and No. 2 in the other, as highlighted in Table 6. The results again highlight our concern regarding the duplication of funding provided to states from several conservation programs under the 2008 Farm Bill which may all be intending to serve the same need.

Table 6. Comparison of the Allocation of EQIP and Other Conservation Programs in FY2011

| State | FY2011 EQIP | | | FY2011 Other Conservation Programs | | |
|-----------------------|-------------------|----------------|-----------|------------------------------------|----------------|-----------|
| | Dollars | Percentage (%) | Rank | Dollars | Percentage (%) | Rank |
| Alabama | 15,519,455 | 1.79 | 25 | 31,950,000 | 1.60 | 26 |
| Arizona | 16,877,395 | 1.95 | 18 | 19,347,000 | 0.97 | 38 |
| Arkansas | 26,895,367 | 3.11 | 4 | 51,878,000 | 2.59 | 12 |
| California | 74,407,856 | 8.60 | 2 | 137,448,000 | 6.87 | 1 |
| Colorado | 26,375,611 | 3.05 | 6 | 46,418,000 | 2.32 | 17 |
| Connecticut | 5,783,139 | 0.67 | 44 | 14,057,000 | 0.70 | 44 |
| Delaware | 4,836,704 | 0.56 | 46 | 13,828,000 | 0.69 | 45 |
| Florida | 17,837,374 | 2.06 | 16 | 124,736,000 | 6.23 | 3 |
| Georgia | 14,384,952 | 1.66 | 27 | 45,072,000 | 2.25 | 18 |
| Idaho | 14,053,282 | 1.62 | 28 | 33,147,000 | 1.66 | 22 |
| Illinois | 12,004,563 | 1.39 | 32 | 23,088,000 | 1.15 | 35 |
| Indiana | 19,175,786 | 2.22 | 14 | 38,077,000 | 1.90 | 20 |
| Iowa | 25,076,733 | 2.90 | 7 | 72,548,000 | 3.63 | 5 |
| Kansas | 23,389,441 | 2.70 | 9 | 48,006,000 | 2.40 | 14 |
| Kentucky | 11,240,067 | 1.30 | 36 | 25,388,000 | 1.27 | 33 |
| Louisiana | 15,731,094 | 1.82 | 24 | 66,177,000 | 3.31 | 8 |
| Maine | 10,687,023 | 1.23 | 37 | 17,809,000 | 0.89 | 39 |
| Maryland | 6,401,732 | 0.74 | 43 | 28,626,000 | 1.43 | 32 |
| Massachusetts | 6,570,442 | 0.76 | 42 | 17,403,000 | 0.87 | 41 |
| Michigan | 15,878,133 | 1.83 | 22 | 31,050,000 | 1.55 | 28 |
| Minnesota | 24,128,400 | 2.79 | 8 | 69,229,000 | 3.46 | 6 |
| Mississippi | 26,876,689 | 3.11 | 5 | 56,474,000 | 2.82 | 9 |
| Missouri | 29,512,639 | 3.41 | 3 | 53,253,000 | 2.66 | 11 |
| Montana | 19,935,799 | 2.30 | 13 | 38,647,000 | 1.93 | 19 |
| Nebraska | 22,700,598 | 2.62 | 10 | 55,774,000 | 2.79 | 10 |
| Nevada | 8,018,510 | 0.93 | 40 | 12,750,000 | 0.64 | 46 |
| New Hampshire | 3,570,465 | 0.41 | 47 | 9,698,000 | 0.48 | 47 |
| New Jersey | 5,066,797 | 0.59 | 45 | 14,820,000 | 0.74 | 42 |
| New Mexico | 22,079,061 | 2.55 | 12 | 30,206,000 | 1.51 | 29 |
| New York | 13,165,947 | 1.52 | 31 | 29,846,000 | 1.49 | 30 |
| North Carolina | 17,543,566 | 2.03 | 17 | 29,535,000 | 1.48 | 31 |
| North Dakota | 17,945,442 | 2.07 | 15 | 67,097,000 | 3.35 | 7 |
| Ohio | 11,926,214 | 1.38 | 33 | 36,985,000 | 1.85 | 21 |
| Oklahoma | 22,498,919 | 2.60 | 11 | 47,859,000 | 2.39 | 16 |
| Oregon | 15,778,502 | 1.82 | 23 | 32,110,000 | 1.60 | 24 |
| Pennsylvania | 13,547,291 | 1.57 | 29 | 47,885,000 | 2.39 | 15 |
| Rhode Island | 3,236,896 | 0.37 | 48 | 7,951,000 | 0.40 | 48 |
| South Carolina | 8,698,653 | 1.00 | 39 | 23,499,000 | 1.17 | 34 |
| South Dakota | 16,133,345 | 1.86 | 20 | 50,141,000 | 2.51 | 13 |
| Tennessee | 11,392,154 | 1.32 | 35 | 32,033,000 | 1.60 | 25 |
| Texas | 85,322,032 | 9.86 | 1 | 127,020,000 | 6.35 | 2 |
| Utah | 16,322,511 | 1.89 | 19 | 19,779,000 | 0.99 | 37 |
| Vermont | 9,500,864 | 1.10 | 38 | 14,310,000 | 0.72 | 43 |
| Virginia | 11,833,178 | 1.37 | 34 | 32,637,000 | 1.63 | 23 |
| Washington | 13,229,797 | 1.53 | 30 | 22,196,000 | 1.11 | 36 |
| West Virginia | 7,124,684 | 0.82 | 41 | 17,499,000 | 0.87 | 40 |
| Wisconsin | 16,024,990 | 1.85 | 21 | 31,616,000 | 1.58 | 27 |
| Wyoming | 14,646,814 | 1.69 | 26 | 80,508,000 | 4.02 | 4 |
| United States | 865,568,629 | 100.00 | | 2,001,281,000 | 100.00 | |

Scenario 2: Quantify the Leverage of Environmental Factors in the EQIP Formula

Case study: Environmental impact by fertilizer.

Organic and inorganic fertilizers can affect the “population, composition, and function” of soil microorganisms (Marschner et al., 2003, p.454). While organic fertilizers help increase soil microbial biomass (Peacock et al., 2001) and improve soil quality and agricultural productivity in the long run, excess application of inorganic fertilizer could lead to environmental pollution and degradation. Eutrophication, a phenomenon of extra nutrients in bodies of water, is normally associated with anthropogenic sources of nutrients. It has been identified as the cause of algal blooms resulting in fish and other wildlife losses. A study by P. Mozumder, 2007 has shown that the amount of inorganic fertilizer used per hectare of arable land is significantly related to increasing biodiversity risk. It is thus of importance to address the issue of unbalanced fertilizer use in EQIP. Therefore, a new factor “Inorganic Fertilizer Use per Hectare of Arable Land (tons /1000 acre)” is added into Scenario 2, shown in Table 7.

Table 7. Allocation Formula with Factor “Ratio of Commercial Fertilizers to Arable Land” Added (Two conditions: a & b)

| Financial Assistance | Weight (a) | Weight (b) |
|--|------------|------------|
| Grazing Land (1,000 ac.) | 10.50% | 10.00% |
| Irrigated Cropland (ac.) | 10.50% | 10.00% |
| Livestock Animal Units (no. of AUEs) | 10.50% | 10.50% |
| Non-Irrigated Cropland (ac.) | 10.50% | 10.00% |
| Cropland Eroding Rates (tons per ac. per year) | 10.50% | 10.50% |
| Impaired Streams 2007 (index) | 10.50% | 10.50% |
| Wetlands (1,000 ac.) | 6.50% | 6.50% |
| Farms and Ranches (no.) | 5.60% | 5.60% |
| Forest Land (ac.) | 5.60% | 5.60% |
| Specialty Crop Farms (no.) | 5.60% | 5.60% |
| At-Risk Species (no.) | 5.60% | 5.60% |
| Cost of Doing Business (USACE index) | 5.60% | 5.60% |
| Ratio of Commercial Fertilizers to Cropland | 1.50% | 3.00% |
| Air Quality Non-Attainment Areas (index) | 1.00% | 1.00% |
| Total | 100.00% | 100.00% |

Source: 2007 Consensus of Agriculture: Table 42 Fertilizer and Chemical Applied

There are 43 states (out of 48) that have EQIP allowance proportion change less than 0.04% (obsolete value) compared to baseline results (Table 8), whereas Texas (-0.06%), California (-0.08%), Pennsylvania (0.72%), Colorado (0.16%) and Nebraska (0.10%) have a higher proportional change, reflecting the higher degree of fertilizer use in these states, especially Pennsylvania. In this scenario, North Carolina was only slightly affected by adding the factor

of fertilizer intensity on arable lands. The EQIP funding proportion for North Carolina decreases 0.03% and 0.06% in Scenario 2(a) and Scenario 2 (b), respectively, as compared to the baseline results, which indicates a moderate level of fertilizer application within NC.

We argue that the technical assistance allowance, along with other conservation programs, should put a strong focus on addressing fertilizer-related conservation issues to guarantee the outcome-based objective of EQIP as well as the long-term goal of resource conservation; however, among the projects granted funding in 2011 through Conservation Innovative Grants (CIG) of EQIP, only three out of 53 projects cover of issue of fertilizer management despite its multi-level functionalities in water, soil, and wildlife conservation. We have identified several issues in this scenario: first, the repetitiveness of EQIP subprograms in addressing similar environmental concerns; second, that inconsistent standards in allocating money within EQIP has created asymmetry of funding allocation; and third, those projects receiving technical assistance funding from EQIP failed to reflect the environmental problems manifested by the financial assistance mechanism of EQIP.

Colinearity among EQIP factors:

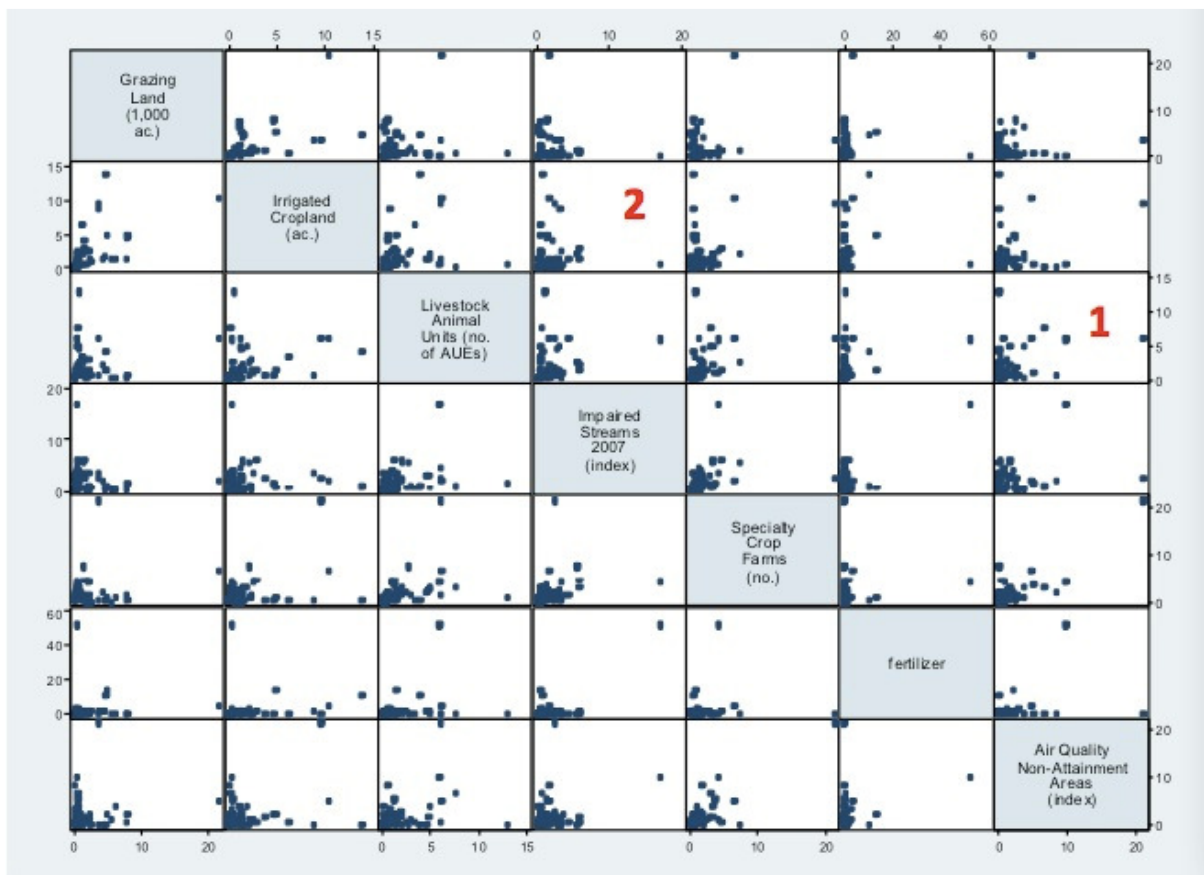


Figure 3: Matrix Plot of EQIP Factors

In addition to the case of multi-level functionalities of fertilizer application in resource conservation as elaborated on above, the above matrix graph of EQIP factors further explains the colinearity among EQIP factors. As Figure 3 shows, formula components are not independent of one another but correlate with each other. Therefore, the weight change or factor change of one factor in the EQIP formula will lead to environmental performance change in another sector. For example, livestock animals and air quality are correlated, as shown in grid 1 in Figure 3. Such correlation has been qualified by studies, results of which show that livestock account for 35%~40% percent of global anthropogenic methane emissions, ~9% of global anthropogenic carbon emissions and ~65% of global anthropogenic Nitrous Oxide emissions (Livestock's role in climate change and air pollution, 2010).

Also, impaired stream is correlated with irrigated cropland (grid 2 in Figure 3). Water runoff from over-fertilized farmland could exacerbate eutrophication, as discussed in scenario 2. A recommendation for program implementation is that a larger proportion of technical funds should be allocated to address such an issue. It could be realized through the Agricultural Water Enhancement Program (AWEP) of EQIP to encourage practices of precision irrigation and fertilization.

Scenario 3: Factor Change by Removing Environmental Quality Factors from the Baseline Formula

As discussed in Scenario 2, the amount of money required to address a certain environmental issue within states might not be proportional to results gained with the EQIP funding formula. Also, stakeholders whose interviews were referenced by the GAO report believe placing more weight on the highest priority environmental problems, would more closely align EQIP funding with its goals (Government Accountability Office, 2006).

This scenario compares the baseline formula with the resource base factors within the EQIP formula (excluding resource quality factors) and discusses the rationale for increasing the weights of environmental quality factors.

Table 8. Comparison of Funding Percentage (with Resource Quality Factors Removed) with the Baseline

| States | Baseline Percentage | Scenario 3 Percentage | EQIP funding Rank | Difference (Scenario 3–baseline) |
|----------------|---------------------|-----------------------|-------------------|----------------------------------|
| Texas | 7.60% | 9.54% | 1 | 1.95% |
| California | 5.35% | 5.99% | 2 | 0.65% |
| Nebraska | 3.54% | 4.72% | 3 | 1.18% |
| Iowa | 3.23% | 4.13% | 5 | 0.90% |
| Kansas | 3.13% | 3.80% | 6 | 0.67% |
| Montana | 2.68% | 3.25% | 9 | 0.57% |
| Minnesota | 3.32% | 3.08% | 4 | -0.24% |
| Missouri | 2.40% | 2.98% | 14 | 0.58% |
| Ohio | 2.22% | 2.77% | 19 | 0.54% |
| Oklahoma | 2.25% | 2.71% | 18 | 0.46% |
| Arkansas | 2.27% | 2.69% | 17 | 0.43% |
| Colorado | 2.64% | 2.65% | 10 | 0.01% |
| Georgia | 2.56% | 2.48% | 11 | -0.08% |
| Indiana | 2.38% | 2.40% | 15 | 0.02% |
| South Dakota | 1.99% | 2.40% | 23 | 0.41% |
| Florida | 3.02% | 2.35% | 7 | -0.67% |
| Illinois | 2.21% | 2.33% | 20 | 0.11% |
| North Carolina | 2.43% | 2.22% | 13 | -0.22% |
| Washington | 2.71% | 2.17% | 8 | -0.54% |
| Oregon | 2.08% | 2.05% | 21 | -0.03% |
| North Dakota | 1.95% | 2.04% | 25 | 0.09% |
| New Mexico | 2.29% | 2.03% | 16 | -0.26% |
| Michigan | 2.54% | 2.00% | 12 | -0.53% |
| Wisconsin | 2.05% | 1.96% | 22 | -0.08% |
| Kentucky | 1.78% | 1.72% | 30 | -0.06% |
| Mississippi | 1.83% | 1.71% | 27 | -0.12% |
| Alabama | 1.95% | 1.69% | 26 | -0.25% |
| Arizona | 1.99% | 1.59% | 24 | -0.40% |
| New York | 1.64% | 1.58% | 32 | -0.06% |
| Tennessee | 1.82% | 1.56% | 28 | -0.26% |
| Idaho | 1.55% | 1.48% | 33 | -0.07% |
| Wyoming | 1.24% | 1.45% | 35 | 0.21% |
| Louisiana | 1.81% | 1.36% | 29 | -0.45% |
| Virginia | 1.72% | 1.31% | 31 | -0.41% |
| Utah | 1.24% | 1.10% | 36 | -0.13% |
| South Carolina | 1.40% | 1.03% | 34 | -0.36% |
| West Virginia | 0.89% | 0.71% | 39 | -0.19% |
| Maine | 0.94% | 0.70% | 38 | -0.24% |
| Nevada | 0.76% | 0.62% | 40 | -0.14% |
| Maryland | 0.75% | 0.61% | 41 | -0.14% |
| New Jersey | 0.95% | 0.59% | 37 | -0.36% |
| Massachusetts | 0.62% | 0.44% | 43 | -0.18% |
| Vermont | 0.43% | 0.38% | 45 | -0.05% |
| Connecticut | 0.57% | 0.35% | 44 | -0.23% |
| New Hampshire | 0.73% | 0.34% | 42 | -0.39% |
| Delaware | 0.41% | 0.30% | 46 | -0.11% |
| Rhode Island | 0.33% | 0.24% | 47 | -0.09% |

As the calculation shows above, environmental quality factors do not play a strong role in diverting funds from states like Texas, Nebraska, Iowa, Kansas, California, or Missouri; their allowance proportion is higher when environmental quality factors are removed from the formula. States such as Florida, Washington, Michigan, Louisiana, Virginia, and Arizona gain more funding when environmental quality factors are taken into account, showing their higher proportion of funding comes from a higher relative value of one or more of the environmental quality factors such as Cropland Eroding Above "T" (Soil Loss Tolerance), Impaired Streams 2007 and Air Quality Non-Attainment Areas. North Carolina's rank declines from 13 in the baseline formula to 31 in the scenario, which means that environmental quality factors play a heavier role (environmental quality is more of a problem for North Carolina) in acquiring federal EQIP funding as compared to other states.

In the EQIP formula, the resources base factor takes up 59% of the total weights among all the factors, while the weight sum of environmental quality factors is only half at 31%. Such concerns have been mentioned in the GAO report, questioning the allocation approach of allocating funds to states with "significant amounts of a particular type of land - such as grazing land or cropland - with more funds, regardless of whether that land is impaired" (Government Accountability Office, 2006).

With the comparison in Scenario 3, we see the necessity of increasing the proportion of environmental quality factors in the EQIP formula to solve identified environmental problems within states rather than profiting resource abundant states. On the other hand, targeting conservation programs should be set up to address specific environmental quality issues identified within states.

Scenario 4: Weight Change

Scenario 4 was designed to examine how weight changes affect the rank of each state. Three scenarios (Scenario 4(a), (b), and (c)) are developed in order to address different aspects of environmental quality focuses. Changes are shown in Table 9 below.

Table 9. Scenarios of Weight Change (Three Conditions: a, b & c)

| Financial Assistance | Baseline | Scenario 4(a) | Scenario 4(b) | Scenario 4(c) |
|--|-----------------|----------------------|----------------------|----------------------|
| Grazing Land (1,000 ac.) | 10.50% | 9.50% | 10.50% | 8.50% |
| Irrigated Cropland (ac.) | 10.50% | 9.50% | 8.50% | 8.50% |
| Livestock Animal Units (no. of AUEs) | 10.50% | 13.00% | 11.00% | 13.00% |
| Non-Irrigated Cropland (ac.) | 10.50% | 9.50% | 8.50% | 8.50% |
| Cropland Eroding Rates (tons per ac. per year) | 10.50% | 9.50% | 10.50% | 8.50% |
| Impaired Streams 2007 (index) | 10.50% | 10.20% | 12.00% | 13.00% |
| Wetlands (1,000 ac.) | 6.50% | 10.00% | 7.00% | 10.00% |
| Farms and Ranches (no.) | 5.60% | 4.70% | 4.00% | 4.00% |
| Forest Land (ac.) | 5.60% | 10.00% | 10.00% | 10.00% |
| Specialty Crop Farms (no.) | 5.60% | 4.70% | 7.00% | 4.00% |
| At-Risk Species (no.) | 5.60% | 4.70% | 7.00% | 8.00% |
| Cost of Doing Business (USACE index) | 5.60% | 4.70% | 4.00% | 4.00% |
| Air Quality Non-Attainment Areas (index) | 1.00% | 0.00% | 0.00% | 0.00% |
| Total | 100.00% | 100.00% | 100.00% | 100.00% |

Scenario 4(a) is to check how weight change of land type affects the funding distribution across states. Resource Base Factors have thus been categorized into “conventional land type” – land types that used to be assigned with high weights in the EQIP formula—which includes Grazing Land, Irrigated Cropland, Non-Irrigated Cropland and Farms and Ranches (No.), and also “unconventional” land type, which include Forestland and Wetlands, which weigh less compared to the “conventional” land type. In Scenario 4(a), the weights of “conventional” land types are decreased by 10%, while weights for “unconventional” land types, as defined above, are increased proportionally.

According to results shown in Table 10 below, although the ranks of Texas and California aren't been affected by such a change, these two states have the highest diversion of EQIP funding, with 0.41% and 0.44% funding decreases, respectively. These decreases are equivalent to 7.3 million EQIP dollars. On the other hand, 4 states (Minnesota, Louisiana, Georgia, Maine) gain statically larger benefit from such an adjustment. These states' increased EQIP proportions are 0.38%, 0.33%, 0.33%, and 0.30%, respectively. This scenario addresses the issue of inequity in terms of funding allocation caused by geographical heterogeneity.

Scenario 4(c) underlines the concern of hydrology–wildlife interaction. In this scenario, Weights of Impaired Streams 2007 (index), Wetlands (1,000 ac.), Forest Land (ac.) and At-Risk Species (no.) are increased. Texas and California and Arizona are the states that have statically higher diversion rates of EQIP dollars, and Minnesota, Louisiana, Georgia and Florida are the biggest beneficiaries of such change.

The scenario analysis in this section reveals that while most states are affected little by the weight changes, certain states with special characteristics or resources suffer the most from weight adjustments in a scenario where there are no complementary backup conservation programs.

Table 10. Allocation Results of Three Scenarios Compared with Baseline

| State | Baseline | | Scenario 4(a) | | Scenario 4(b) | | Scenario 4 (c) | |
|----------------|--------------------------|------|--------------------------|------|--------------------------|------|--------------------------|------|
| | Percentage of Total Fund | Rank | Percentage of Total Fund | Rank | Percentage of Total Fund | Rank | Percentage of Total Fund | Rank |
| Texas | 7.60% | 1 | 7.19% | 1 | 7.19% | 1 | 6.79% | 1 |
| California | 5.35% | 2 | 4.91% | 2 | 5.52% | 2 | 5.13% | 2 |
| Missouri | 2.40% | 15 | 2.38% | 17 | 2.31% | 16 | 2.28% | 17 |
| Arkansas | 2.27% | 18 | 2.41% | 15 | 2.24% | 18 | 2.35% | 14 |
| Mississippi | 1.83% | 28 | 2.03% | 26 | 1.93% | 26 | 2.02% | 25 |
| Colorado | 2.64% | 11 | 2.42% | 14 | 2.46% | 14 | 2.28% | 18 |
| Iowa | 3.23% | 6 | 3.38% | 5 | 3.07% | 7 | 3.28% | 6 |
| Minnesota | 3.32% | 5 | 3.70% | 4 | 3.35% | 4 | 3.64% | 4 |
| Kansas | 3.13% | 7 | 2.87% | 9 | 2.78% | 9 | 2.74% | 11 |
| Nebraska | 3.54% | 4 | 3.33% | 6 | 3.13% | 6 | 3.10% | 7 |
| Oklahoma | 2.25% | 19 | 2.17% | 21 | 2.19% | 21 | 2.08% | 23 |
| New Mexico | 2.29% | 17 | 2.10% | 23 | 2.30% | 17 | 1.99% | 26 |
| Montana | 2.68% | 10 | 2.49% | 13 | 2.49% | 13 | 2.33% | 15 |
| Indiana | 2.38% | 16 | 2.41% | 16 | 2.36% | 15 | 2.48% | 13 |
| North Dakota | 1.95% | 26 | 1.87% | 28 | 1.74% | 33 | 1.75% | 32 |
| Florida | 3.02% | 8 | 3.24% | 7 | 3.32% | 5 | 3.45% | 5 |
| North Carolina | 2.43% | 14 | 2.67% | 11 | 2.60% | 12 | 2.75% | 10 |
| Arizona | 1.99% | 25 | 1.77% | 29 | 1.96% | 25 | 1.71% | 33 |
| Utah | 1.24% | 37 | 1.17% | 37 | 1.19% | 36 | 1.16% | 37 |
| South Dakota | 1.99% | 24 | 1.89% | 27 | 1.80% | 31 | 1.76% | 31 |
| Wisconsin | 2.05% | 23 | 2.23% | 19 | 2.10% | 23 | 2.18% | 20 |
| Michigan | 2.54% | 13 | 2.74% | 10 | 2.70% | 11 | 2.84% | 9 |
| Oregon | 2.08% | 22 | 2.07% | 25 | 2.20% | 19 | 2.13% | 21 |
| Louisiana | 1.81% | 30 | 2.14% | 22 | 1.88% | 28 | 2.12% | 22 |
| Alabama | 1.95% | 27 | 2.18% | 20 | 2.20% | 20 | 2.30% | 16 |
| Wyoming | 1.24% | 36 | 1.14% | 38 | 1.17% | 37 | 1.07% | 38 |
| Georgia | 2.56% | 12 | 2.89% | 8 | 2.75% | 10 | 2.91% | 8 |
| Idaho | 1.55% | 34 | 1.46% | 35 | 1.48% | 35 | 1.45% | 35 |
| Pennsylvania | 3.83% | 3 | 3.82% | 3 | 4.08% | 3 | 4.24% | 3 |
| Washington | 2.71% | 9 | 2.66% | 12 | 2.85% | 8 | 2.73% | 12 |
| New York | 1.64% | 33 | 1.77% | 30 | 1.76% | 32 | 1.77% | 30 |
| Illinois | 2.21% | 21 | 2.09% | 24 | 2.05% | 24 | 2.08% | 24 |
| Ohio | 2.22% | 20 | 2.27% | 18 | 2.15% | 22 | 2.23% | 19 |
| Virginia | 1.72% | 32 | 1.76% | 33 | 1.85% | 29 | 1.89% | 27 |
| Tennessee | 1.82% | 29 | 1.76% | 31 | 1.90% | 27 | 1.88% | 28 |
| Kentucky | 1.78% | 31 | 1.76% | 32 | 1.82% | 30 | 1.82% | 29 |
| Maine | 0.94% | 39 | 1.24% | 36 | 1.12% | 38 | 1.25% | 36 |
| Vermont | 0.43% | 46 | 0.45% | 46 | 0.45% | 46 | 0.45% | 46 |
| South Carolina | 1.40% | 35 | 1.56% | 34 | 1.54% | 34 | 1.64% | 34 |
| Nevada | 0.76% | 41 | 0.68% | 43 | 0.73% | 42 | 0.70% | 43 |
| West Virginia | 0.89% | 40 | 0.93% | 39 | 1.00% | 39 | 1.01% | 39 |
| Massachusetts | 0.62% | 44 | 0.60% | 44 | 0.65% | 44 | 0.66% | 44 |
| Maryland | 0.75% | 42 | 0.71% | 42 | 0.72% | 43 | 0.73% | 42 |
| Connecticut | 0.57% | 45 | 0.51% | 45 | 0.55% | 45 | 0.54% | 45 |
| New Jersey | 0.95% | 38 | 0.82% | 40 | 0.88% | 40 | 0.85% | 40 |
| Delaware | 0.41% | 47 | 0.36% | 47 | 0.37% | 47 | 0.37% | 47 |
| New Hampshire | 0.73% | 43 | 0.73% | 41 | 0.80% | 41 | 0.83% | 41 |
| Rhode Island | 0.33% | 48 | 0.29% | 48 | 0.31% | 48 | 0.30% | 48 |

From the analysis of weight changes illustrated above, the EQIP funding allocation strategy of emphasizing commodity-exporting land types automatically prioritizes states with large land size and abundant agricultural resources. The standardized funding formula puts states with less highly-weighted land types at a disadvantage, though these land types (e.g., wetland or forested land) could be significant in terms of environmental quality improvement and resources conservation.

This scenario analysis shows the importance of having targeted conservation and special programs in place to counterbalance the skewed funding allocation caused by the subjective design of EQIP funding mechanism and geographical heterogeneity.

d. Formula Decomposition Analysis for Selected States

This analysis was used to compare NC with a group of states that rank similar with NC in EQIP funding gained. To study in-depth how each factor within the EQIP formula affects the funding allocation, graphs are drawn comparatively with each emphasizing one of the main factors in the EQIP formula.

Two factors are eliminated in the analysis: “Cost of Doing Business” and “Air Quality”. The values of Cost of Doing Business are not statistically different from one another among states (Figure 4) thus have little effect on determining funding allocations. Air Quality is eliminated due to its small proportion in the funding formula (1%).

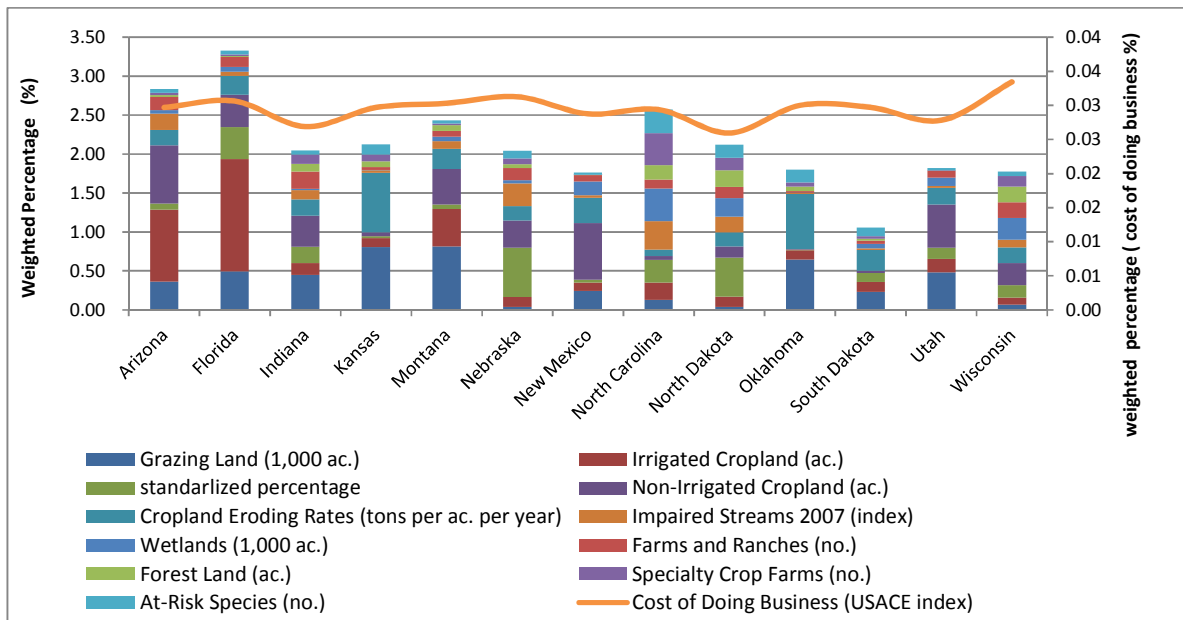


Figure 4: “Cost of Doing Business” Compared to Other Factors

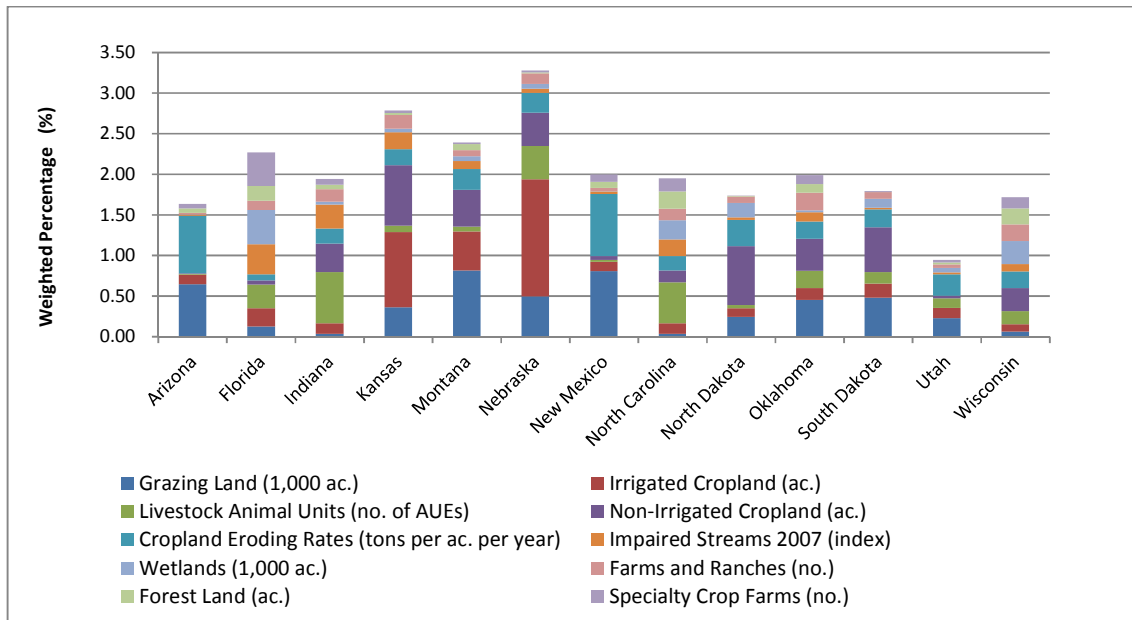


Figure 5: EQIP Funding Allocation Among Selected States

The height of the bar reflects the aggregate value of environmental components in the EQIP funding formula with each component colored distinctively. States that rank highly in terms of EQIP finance assistance gained, such as Kansas, Nebraska, Oklahoma and New Mexico have higher proportions of irrigated cropland and/or grazing land which are also weighed highly (10.67%) in the EQIP formula. To assess how each factor influences the rank of states, selected factors are drawn separately in the following graphs.

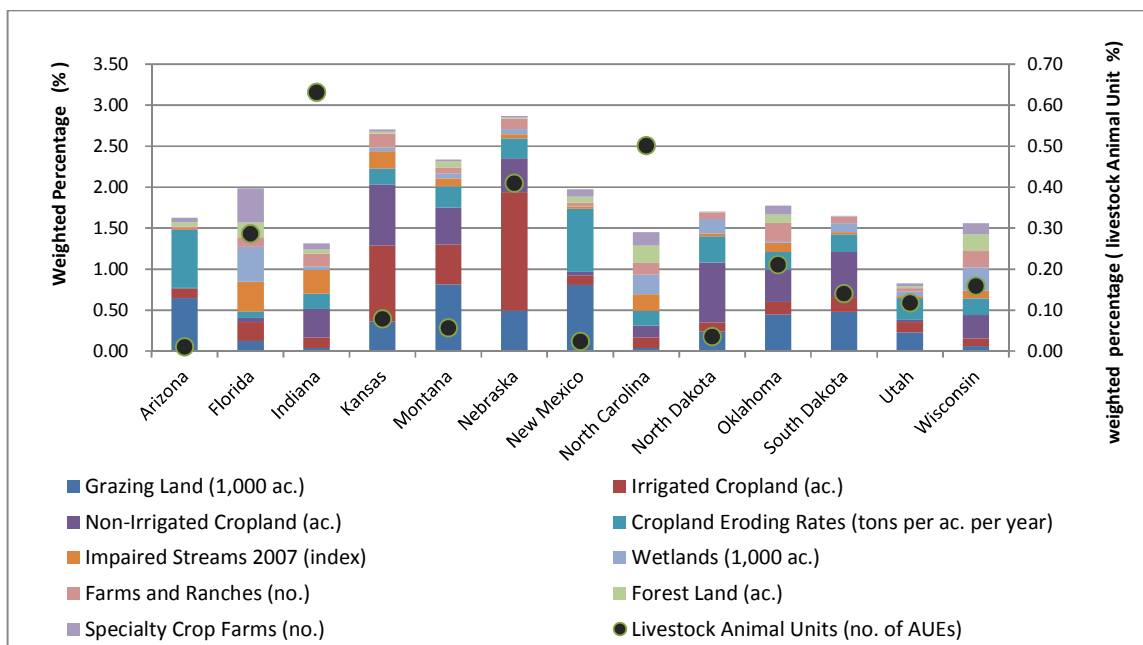


Figure 6: Funding Comparison with “Livestock Animal Units (No. of AUEs)” Separately Shown

North Carolina has a comparative advantage in the factor of “Livestock Animal Units (No. of AUEs),” as shown in Figure 6. However, it has a much lower percentage of “Irrigated Cropland (ac.)” and “Non-Irrigated Cropland (ac.)” This causes the low rank (9th) of NC among the 13 states selected. It’s mandated in the Farm Bill that 60% of EQIP funding is allocated to livestock-related issues, which is meant to assist small livestock producers in animal waste management. However, it ultimately benefits that largest confined animal feeding operations the most—these farms could gain up to 75 percent of reimbursement (capped at \$300,000 per owner). In contrast, organic farming projects are capped at \$20,000 a year per operator under EQIP funds (Food, Conservation, and Energy Act, 2008). The type and amount of antibiotics contained in the feed given to livestock is expected to be regulated in the Delivering Antimicrobial Transparency in Animals (DATA) Act among large-scale producers (Summary: Delivering Antimicrobial Transparency in Animals (DATA) Act, 2013). Considering the budget cut of the newest Farm Bill, and the increasing concern for public health regarding meat production, NC might consider taking proactive approaches to meet the higher standards to guarantee continuous funding for the livestock sector.

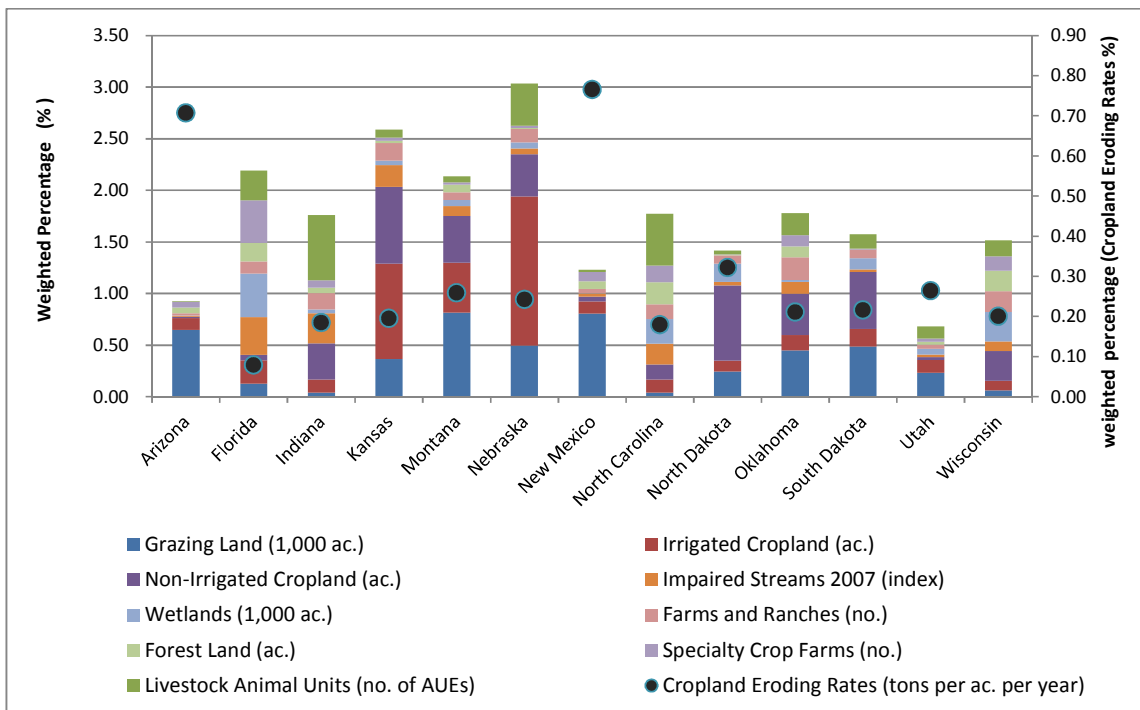


Figure 7: Fund Comparison with “Cropland Eroding Rates” Separately Shown

Figure 7 identifies the eminent cropland eroding problem within states of Arizona and New Mexico. North Carolina ranks at mid-range among other states for this factor.

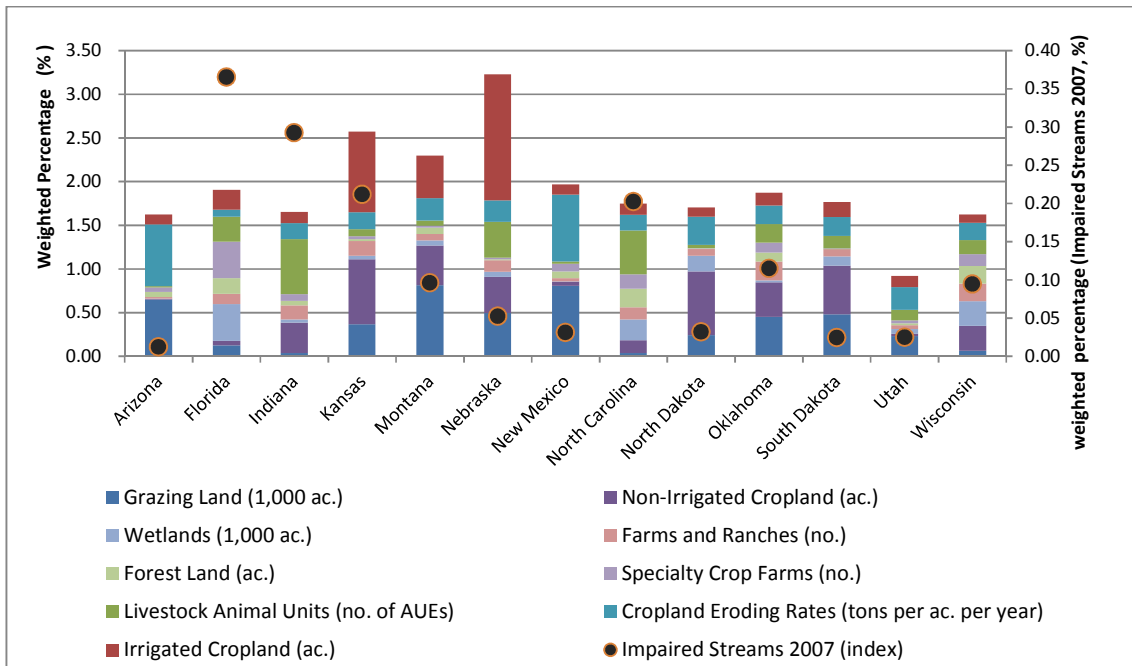


Figure 8: Fund Comparison with “Impaired Streams 2007” Separately Shown

Compared to other states, North Carolina gained a relatively larger proportion of funding with a higher value of the “Impaired Streams 2007” factor. However, the measurement of water quality, and the blurred definition of water body boundaries across states are flagged for the concerns of data reliability. The funding allocation in 2011 through the Agricultural Water Enhancement Program (AWEP) (Figure 9), however, shows a different view of the water issue being addressed through EQIP, which is quite different from the aspect of “Impaired Streams 2007” water quality factor within the EQIP formula.

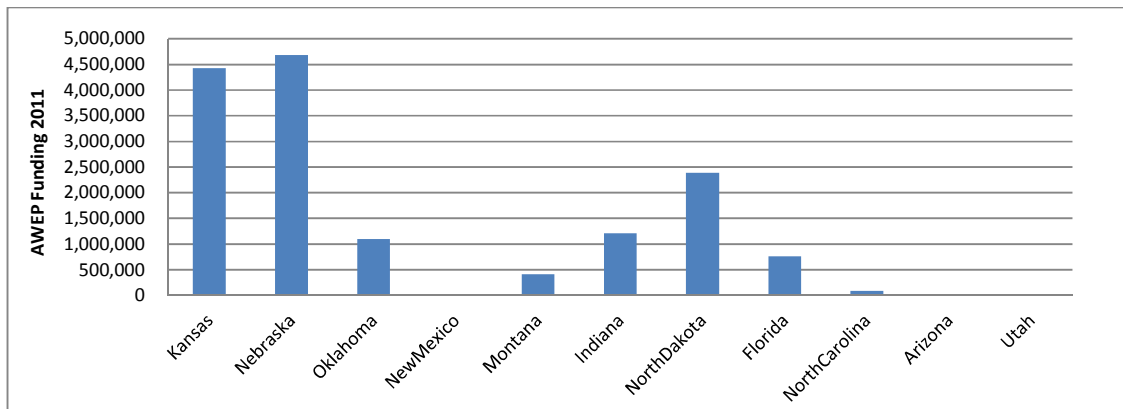


Figure 9: Agricultural Water Enhancement Program (AWEP) Awards in FY 2011

This part of the analysis shows how the ranking system of EQIP financial assistance works with a focus on North Carolina. North Carolina has a comparative advantage owed to a larger proportion of “Livestock Animal Units,” but it has rather small quantities of “Irrigated

Cropland (ac),” “Non-Irrigated Cropland (ac),” and “Grazing Land (1,000 ac),” which are weighed equally high with “Livestock Animal Units” in the EQIP formula. There are great discrepancies within the values of “Impaired Streams 2007” among the selected states and the existent of such data within the EQIP formula can hardly add score to the effectiveness of EQIP funding allocation due to the inability of such outdated data to reflect actual water quality issues.

V. SUMMARY AND RECOMMENDATIONS

Throughout our analysis, a number of reoccurring themes emerged. Chief among them was the need for increased local involvement, technical assistance, special projects, and transparency. We also recommend a shift away from resource quantity factors to environmental degradation factors. The following is a more detailed exploration of each of our recommendations:

1. Place more emphasis on bottom-up, local projects.

Throughout our interviews, stakeholders repeatedly emphasized a need to place more focus on strong leadership at the local levels of NRCS so that highest priority needs are being addressed by NRCS staff closest to the problem, and with the most first-hand knowledge. While we believe decisions are best made at the local level, there should also be an additional layer of review at the regional level to allow for comparison and evaluation across projects. The new SRA funding allocation tool allows states to identify which conservation areas are of more concern in their state and to designate criteria and their respective weights accordingly. While the SRAs are a step in the right direction, we believe that even more emphasis could be placed on bottom-up local projects. As discussed more in depth below, we also believe that increased emphasis on special projects is currently the best avenue for North Carolina to secure additional funding.

2. Increase funding for technical assistance.

Historically there has been a greater emphasis placed on providing financial assistance for built structures at the expense of technical assistance dollars. However, technical assistance is advocated by many in leadership roles of NRCS as being the most dollar-for-dollar effective aspect of EQIP, thus meeting EQIP’s original mandate of maximizing environmental benefit per dollar spent. Continuing to increase direct payments to farmers at the expense of technical assistance will ultimately hurt EQIP as there will not be enough staff to create meaningful implementation plans to put the dollars to work. Without this transfer of institutional knowledge, direct payments become an increasingly less meaningful tool for achieving improvement in conservation. Bridging the gap between financial and technical assistance will ensure that they are more complementary to one another in addressing environmental issues.

3. Increase funding for CIG and other special projects

Our second scenario analysis shows that because the factors within the funding formula are so highly correlated with one another, added emphasis (as indicated by increasing the factor's weight within a reasonable range) on just one factor does not result in large changes in the state rankings. In our case example, when we add a factor (inorganic fertilizer use per hectare of arable land) to address issues that are of large environmental concern (nutrient runoff and eutrophication) the rankings remain relatively unchanged. The funding formula is based on the assumption that the relationship between the amount of money required for a project and results of the EQIP formula is linear. More in-depth analysis needs to be conducted to explore the interconnection among the indicators in the formula to increase the efficiency of EQIP dollars.

We feel the best way to address specific areas of concern is not through tweaking formula weights, but through a combination of special projects and innovation grants. Traditionally money has been distributed according to general needs of states without thinking about using dollars strategically. With additional funding for special projects, such as those currently in CIG, states that have identified specific areas of concern will be able to petition for more dollars to meet these needs. We recommend that North Carolina should work with local research institutions such as land-grant universities to identify local environmental projects for consideration in the national CIG competition.

4. Increase the transparency of funding mechanisms.

Throughout our project, we were confronted by many of the same challenges that GAO faced in its earlier investigation of EQIP. Overall we found that the funding mechanism was too opaque to allow for extensive scrutiny. NRCS was unable to answer requests for data that was inputted into the formula in previous years, leading us to question whether the process has been properly managed. Ultimately we were unable to acquire all of the data we needed to conduct a quantitative analysis of the funding mechanism at the level we initially desired to. Along the same lines, we found the data tool, ProTracts, used by NRCS, makes it challenging to extract data in a way that is easily amenable to evaluation. It takes a substantial amount of effort to extract information which might present itself in a meaningful way to anyone who might try to evaluate the performance of programs. One cannot go into ProTracts and query the data. All data must be extracted out of ProTracts, cleaned, and accessed through another database software for it to be accessible as any type of evaluative tool. Without the necessary data we were unable to complete our initial goal of analyzing how closely the formula was adhered to in the processes of ranking states and of allocating dollars.

The inability of outside persons to replicate the funding formula not only seriously jeopardizes the legitimacy of funding decisions, but also makes it very difficult to determine if the formula actually optimizes environmental benefits in the way EQIP was designed to. Although NRCS has moved away from the formula mechanism, there already have been concerns expressed with the new SRA process. Specifically, the requirement to use the

NLCD was found to be not only arbitrary and inconsistent with standard procedure, but also required certain assumptions to be made, resulting in inconsistencies between states. Such concerns are reminiscent of the GAO's "no specific documented rationale" critique of the old formula. NRCS must increase the transparency behind its funding decisions, not only to appease states, but also to prove that EQIP delivers unquestionable benefit to the environment.

5. Understand the financial implications of consolidation.

Last year the Senate proposed to fold four existing standalone programs into EQIP. If this proposal is successful, there are important implications for both overall EQIP funding and for individual state allocations. In our qualitative analysis we show that the Senate proposal cuts funding for EQIP and the consolidated programs by almost a billion dollars in its first year of implementation alone.

Perhaps not as immediately clear is our conclusion that consolidation could also alter the proportion of funding states receive relative to one another. In our first scenario analysis we find that there is some overlap between EQIP funding and funding for other Farm Bill conservation programs. California and Texas rank first and second in terms of EQIP funding and other program funding. This indicates that if the Senate proposal is adopted, these states will continue to receive large proportions of EQIP funding. Conversely, North Carolina ranks 17th in EQIP funds, but 31st in other program funding, indicating that North Carolina may receive an even smaller proportion of total funds if consolidation moves forward. Therefore, the NRCS North Carolina office should conduct further research on the environmental impact that consolidation will have both in terms of total reduced funding and on the allocation of funds to individual states. Finally, whether consolidation does or does not go through, NRCS needs to create clearer categorization of conservation programs to avoid funding overlap and to increase the marginal benefit of EQIP dollars.

6. Place more emphasis on factors indicating environmental degradation.

After conducting its own review of the EQIP funding mechanism, GAO recommended an added emphasis on factors that indicate the presence of environmental problems in a state. This increased weighting would be at the expense of factors simply based on the amount of natural resources in a state. In our third scenario analysis, we remove the environmental problem factors and use only the resource quantity factors. As a result, we found that some states such as Texas, Nebraska and Iowa would receive considerable more funding under a resource quantity only formula. In fact these three states received a quarter to a third more funding than in the baseline scenario.

Additionally, North Carolina is among the states that would receive less funds in a resource quantity only scenario. The state received 9 percent less funding in our analysis. We can conclude that North Carolina would benefit from an increase in weights to factors indicating the presence of environmental degradation. As such a move is also consistent with the GAO's recommendations, we believe that NRCS should place a heavier emphasis on environmental problem factors.

In conclusion, while the EQIP program has been largely successful in increasing funding for conservation practices among farmers and ranchers and as a preferred alternative to additional regulation, EQIP has also been plagued with questions over its funding allocation from the very start. The move towards bottom-up SRAs should address some critiques, but their initial implementation has suffered from some of the same inconsistencies and questions that beleaguered the previous formula mechanism. We believe that NRCS should address these concerns by crafting an allocation method that is both transparent and replicable. In addition, we think NRCS should also strive to reduce redundancies among conservation programs, allocate more money to technical assistance and special projects, continue to embrace a more localized approach, and when utilizing existing datasets, focus on those that indicate actual environmental degradation. In doing so, NRCS will move EQIP more in line with its stated goal of optimizing environmental benefit.

VI. PROJECT TEAM

Student Team



Emily Gilbert is a second-year Master of Environmental Management student concentrating in Environmental Economics and Policy. Emily is particularly interested in natural resource and agricultural economics. With a Bachelor's degree in Plant Science from the University of Missouri, Emily uses her understanding of natural science to better understand how best management practices can improve conservation of natural resources and efficiency of effort and money spent. Emily has a particular interest in the interplay of science, policy, and economics for understanding how to solve complex environmental issues. Emily most recently interned with a non-profit organization in the Midwest that works to develop greater acceptance and practice of urban organic agriculture through community-based initiatives and by partnership with privately and federally funded projects.



Jiemei Liu is a Master of Environmental Management candidate at Duke University with the concentration in Environmental Economics and Policy. Jiemei received bachelor degrees in Ecology (Major) and Finance (Minor) at East China Normal University. Before coming to Duke, Jiemei worked as a part-time research assistant at the Waste Management Modeling and Energy Recovery project affiliate with the Shanghai Science and Technology Committee, during which Jiemei conducted data analysis and calculated greenhouse gas reductions related to changes in waste management practices. Jiemei also worked as an outreach intern in the Communication Department of Bayer at its Shanghai office. Jiemei is interested in energy efficiency, resources, conservation finance as well as market-based environmental policy solutions.



Ashley Neal is a Master of Environmental Management candidate at the Nicholas School of the Environment. She is majoring in environmental economics and policy with a focus on energy. Most recently, Ashley interned at Self-Help Community Development Corporation in Durham, NC. She collaborated on the development of an energy efficiency loan product in partnership with Bank of America. Formerly, Ashley was a Senior Customized Reporting Analyst at Convergent Wealth Advisors, an independent boutique wealth management firm and a Mutual Fund Accountant at Rydex Investments, a mutual fund company. In 2008 Ashley earned the Chartered Alternative Investment Analyst designation. She received a BS in Finance and a BA in Government and Politics from the University of Maryland, where she was a Banneker-Key Scholar.



Jianming Qin is a second year Master of Environmental Management with concentration on Environmental Economics and Policy. With a Bachelor Degree in Environmental Science from Renmin University of China, she has been working on developing a solid knowledge background and a comprehensive perspective for studying current global environmental issues. She has worked on researching and analyzing China's electricity pricing system as well as the regulation and policy at the Demand Side Management

Technique Center at Natural Resources Defense Council (NRDC), and is currently working at Duke Center for Sustainability & Commerce evaluating the feasibility of energy recovery projects for Dow Water & Process Solutions, focusing on analyzing the extensibility in specific geographical markets. Her career interests include environmental policy analysis with focus on energy, corporate sustainability strategy, green business innovation, and environmental decision analysis.

Advisors



Christopher Galik is a senior policy associate at Duke's Nicholas Institute for Environmental Policy Solutions. He is currently working to better document issues associated with on-the-ground implementation of climate and low-carbon energy policy. He continues to partner with researchers at North Carolina State University to investigate the forest resource implications of expanded renewable energy targets. Christopher is currently a Forestry and Environmental Resources Ph.D. student at North Carolina State University. He received his Master of Environmental Management in Resource Economics and Policy at the Nicholas School of the Environment at Duke University in 2002. He also received his Bachelor of Arts in Biology from Vassar College in 1999. Prior to joining Duke's Nicholas Institute, Christopher served as a research coordinator for the Climate Change Policy Partnership (CCPP). Before CCPP, Christopher spent several years in Washington, D.C. as a policy analyst, specializing in species conservation and federal forest management and policy.



Dean Urban is a Professor of Landscape Ecology and Division Chair of Environmental Sciences & Policy at Duke University's Nicholas School of the Environment. He received a PhD in Ecology from the University of Tennessee in 1986, a MA in Wildlife Ecology from Southern Illinois University at Carbondale in 1981 and a BA in Botany and Zoology from Southern Illinois University at Carbondale in 1978. Urban's experience lies in landscape ecology and forest community ecology, conservation biology, spatial and multivariate analysis, and simulation modeling.

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VIII. APPENDICES

Appendix 1. Funding for EQIP Subprograms Since 1996

| Year | Total Funding Authorized by Legislation ¹ | Direct Payments, Technical & Educational Assistance ² | Ground and Surface Water Conservation Program | Klamath River Basin | Agricultural Water Enhancement Program | Agricultural Conservation Easement Program | Mandated Wildlife Habitat | Total Spent | Difference |
|------|--|--|---|---------------------|--|--|---------------------------|---------------|---------------|
| | | | 2002 Additions | | 2008 Addition | Proposed 2013 Additions | | | |
| | | | | | Replaced GSWCP and KRB | Replaces WRP, FPP, and GRP | Replaces WHIP | | |
| 1997 | 130,000,000 | 196,000,000 | - | - | - | - | - | 196,000,000 | (66,000,000) |
| 1998 | 200,000,000 | 194,000,000 | - | - | - | - | - | 194,000,000 | 6,000,000 |
| 1999 | 200,000,000 | 170,000,000 | - | - | - | - | - | 170,000,000 | 30,000,000 |
| 2000 | 200,000,000 | 170,000,000 | - | - | - | - | - | 170,000,000 | 30,000,000 |
| 2001 | 200,000,000 | 164,000,000 | - | - | - | - | - | 164,000,000 | 36,000,000 |
| 2002 | 400,000,000 | 202,000,000 | - | - | - | - | - | 202,000,000 | 198,000,000 |
| 2003 | 700,000,000 | 643,000,000 | 54,000,000 | 12,000,000 | - | - | - | 709,000,000 | (9,000,000) |
| 2004 | 1,000,000,000 | 903,000,000 | 65,000,000 | 19,000,000 | - | - | - | 987,000,000 | 13,000,000 |
| 2005 | 1,200,000,000 | 950,000,000 | 65,000,000 | 10,000,000 | - | - | - | 1,025,000,000 | 175,000,000 |
| 2006 | 1,200,000,000 | 992,000,000 | 70,000,000 | 11,000,000 | - | - | - | 1,073,000,000 | 127,000,000 |
| 2007 | 1,300,000,000 | 993,000,000 | 70,000,000 | 8,000,000 | - | - | - | 1,071,000,000 | 229,000,000 |
| 2008 | 1,200,000,000 | 1,193,000,000 | 59,000,000 | - | - | - | - | 1,252,000,000 | (52,000,000) |
| 2009 | 1,337,000,000 | 1,055,000,000 | - | - | 72,000,000 | - | - | 1,127,000,000 | 210,000,000 |
| 2010 | 1,450,000,000 | 1,174,000,000 | - | - | 72,000,000 | - | - | 1,246,000,000 | 204,000,000 |
| 2011 | 1,588,000,000 | 1,231,000,000 | - | - | 73,000,000 | - | - | 1,304,000,000 | 284,000,000 |
| 2012 | 1,750,000,000 | 1,400,000,000 | - | - | 60,000,000 | - | - | 1,460,000,000 | 290,000,000 |
| 2013 | 1,500,000,000 | 1,403,000,000 | - | - | 60,000,000 | 450,000,000 | 75,000,000 | 1,988,000,000 | (488,000,000) |

¹ When legislation overlapped years, the most recent law was used to determine funding. 2013's authorization was taken from the proposed Senate bill.

² 2012 and 2013 spending amounts are estimates. 1997 - 2011 are actual amounts spent.

Sources: Fiscal Years 1999-2013 Appendix Budgets of the U.S. Government, 1996 FAIR Act Frames Farm Policy For 7 Years, The 2002 Farm Bill: Provisions and Economic Implications, The 2008 Farm Bill: Major Provisions and Legislative Action, The Senate Agriculture Committee's 2012 Farm Bill (S. 3240): A Side-by-Side Comparison with Current Law

Appendix 2. Historical Authorizations of Programs Proposed for Consolidation

| Year | Wildlife Habitat Incentives Program ¹ | Wetlands Reserve Program ² | Grasslands Reserve Program ³ | Farm and Ranch Land Protection Program ⁴ | Total Authorized |
|------|--|---------------------------------------|---|---|------------------|
| 1997 | 10,000,000 | - | - | 7,000,000 | 17,000,000 |
| 1998 | 10,000,000 | - | - | 7,000,000 | 17,000,000 |
| 1999 | 10,000,000 | - | - | 7,000,000 | 17,000,000 |
| 2000 | 10,000,000 | - | - | 7,000,000 | 17,000,000 |
| 2001 | 10,000,000 | - | - | 7,000,000 | 17,000,000 |
| 2002 | 15,000,000 | - | - | 50,000,000 | 65,000,000 |
| 2003 | 30,000,000 | - | 50,800,000 | 100,000,000 | 180,800,000 |
| 2004 | 60,000,000 | - | 50,800,000 | 125,000,000 | 235,800,000 |
| 2005 | 85,000,000 | - | 50,800,000 | 125,000,000 | 260,800,000 |
| 2006 | 85,000,000 | - | 50,800,000 | 100,000,000 | 235,800,000 |
| 2007 | 85,000,000 | - | 50,800,000 | 97,000,000 | 232,800,000 |
| 2008 | 85,000,000 | - | - | 97,000,000 | 182,000,000 |
| 2009 | 85,000,000 | - | - | 121,000,000 | 206,000,000 |
| 2010 | 85,000,000 | - | - | 150,000,000 | 235,000,000 |
| 2011 | 85,000,000 | - | - | 175,000,000 | 260,000,000 |
| 2012 | 85,000,000 | - | - | 200,000,000 | 285,000,000 |

¹ Funding for WHIP was limited to \$50 million from 1997-2001.

² Congress has not set spending limits for WRP. In 2002 the CBO estimated WRP would cost \$1.5 billion over 10 years.

³ GRP was created in 2002. Congress has not set a spending limit since 2007.

⁴ Funding for FRLP was limited to \$35 million from 1997-2001.

Sources: Fiscal Years 1999-2013 Appendix Budgets of the U.S. Government, 1996 FAIR Act Frames Farm Policy For 7 Years, The 2002 Farm Bill: Provisions and Economic Implications, The 2008 Farm Bill: Major Provisions and Legislative Action, The Senate Agriculture Committee's 2012 Farm Bill (S. 3240): A Side-by-Side Comparison with Current Law

Appendix 3. Historical Appropriations of Programs Proposed for Consolidation

| Year ¹ | Wildlife Habitat Incentives Program | Wetlands Reserve Program | Grasslands Reserve Program | Farm and Ranch Land Protection Program | Total Spent |
|-------------------|-------------------------------------|--------------------------|----------------------------|--|-------------|
| 1997 | - | 99,000,000 | - | 2,000,000 | 101,000,000 |
| 1998 | 26,000,000 | 212,000,000 | - | 17,000,000 | 255,000,000 |
| 1999 | 22,000,000 | 113,000,000 | - | - | 135,000,000 |
| 2000 | 1,000,000 | 154,000,000 | - | - | 155,000,000 |
| 2001 | 15,000,000 | 163,000,000 | - | 17,000,000 | 195,000,000 |
| 2002 | 15,000,000 | 263,000,000 | - | 50,000,000 | 328,000,000 |
| 2003 | 24,000,000 | 309,000,000 | 38,000,000 | 78,000,000 | 449,000,000 |
| 2004 | 38,000,000 | 285,000,000 | 57,000,000 | 91,000,000 | 471,000,000 |
| 2005 | 46,000,000 | 267,000,000 | 71,000,000 | 112,000,000 | 496,000,000 |
| 2006 | 43,000,000 | 191,000,000 | 35,000,000 | 74,000,000 | 343,000,000 |
| 2007 | 42,000,000 | 248,000,000 | 13,000,000 | 73,000,000 | 376,000,000 |
| 2008 | 84,000,000 | 183,000,000 | 3,000,000 | 96,000,000 | 366,000,000 |
| 2009 | 73,000,000 | 436,000,000 | 48,000,000 | 119,000,000 | 676,000,000 |
| 2010 | 83,000,000 | 630,000,000 | 100,000,000 | 150,000,000 | 963,000,000 |
| 2011 | 83,000,000 | 569,000,000 | 78,000,000 | 169,000,000 | 899,000,000 |
| 2012 | 50,000,000 | 707,000,000 | 67,000,000 | 150,000,000 | 974,000,000 |
| 2013 | 73,000,000 | 224,000,000 | 5,000,000 | 200,000,000 | 502,000,000 |

¹2012 and 2013 spending amounts are estimates. 1997-2011 are actual amounts spent.

Sources: Fiscal Years 1999-2013 Appendix Budgets of the U.S. Government, 1996 FAIR Act Frames Farm Policy For 7 Years, The 2002 Farm Bill: Provisions and Economic Implications, The 2008 Farm Bill: Major Provisions and Legislative Action, The Senate Agriculture Committee’s 2012 Farm Bill (S. 3240): A Side-by-Side Comparison with Current Law

Appendix 4. Historical Authorizations Versus
Appropriations of Programs Proposed for Consolidation

| Year ¹ | Total Authorized | Total Spent | Difference |
|-------------------|------------------|-------------|---------------|
| 1997 | 17,000,000 | 101,000,000 | (84,000,000) |
| 1998 | 17,000,000 | 255,000,000 | (238,000,000) |
| 1999 | 17,000,000 | 135,000,000 | (118,000,000) |
| 2000 | 17,000,000 | 155,000,000 | (138,000,000) |
| 2001 | 17,000,000 | 210,000,000 | (193,000,000) |
| 2002 | 65,000,000 | 328,000,000 | (263,000,000) |
| 2003 | 180,800,000 | 449,000,000 | (268,200,000) |
| 2004 | 235,800,000 | 471,000,000 | (235,200,000) |
| 2005 | 260,800,000 | 496,000,000 | (235,200,000) |
| 2006 | 235,800,000 | 343,000,000 | (107,200,000) |
| 2007 | 232,800,000 | 376,000,000 | (143,200,000) |
| 2008 | 182,000,000 | 366,000,000 | (184,000,000) |
| 2009 | 206,000,000 | 676,000,000 | (470,000,000) |
| 2010 | 235,000,000 | 963,000,000 | (728,000,000) |
| 2011 | 260,000,000 | 899,000,000 | (639,000,000) |
| 2012 | 285,000,000 | 974,000,000 | (689,000,000) |
| 2013 | 525,000,000 | 502,000,000 | 23,000,000 |

¹2012 and 2013 spending amounts are estimates. 1997-2011 are actual amounts spent.

Sources: Fiscal Years 1999-2013 Appendix Budgets of the U.S. Government, 1996 FAIR Act Frames Farm Policy For 7 Years, The 2002 Farm Bill: Provisions and Economic Implications, The 2008 Farm Bill: Major Provisions and Legislative Action, The Senate Agriculture Committee's 2012 Farm Bill (S. 3240): A Side-by-Side Comparison with Current Law

Appendix 5. EQIP End-of-Year Allowances by State (FY 2009-2011)

| State | FY 2009 | FY 2010 | FY 2011 |
|----------------|----------------|----------------|----------------|
| North Carolina | 14,394,842.69 | 13,545,968.19 | 17,543,566.00 |
| Alabama | 12,525,964.57 | 12,705,872.73 | 15,519,455.00 |
| Arizona | 17,271,657.56 | 17,984,691.50 | 16,877,395.00 |
| Arkansas | 15,084,794.83 | 19,036,393.38 | 26,895,367.00 |
| California | 58,631,319.78 | 75,167,081.37 | 74,407,856.00 |
| Colorado | 24,626,541.02 | 28,108,016.02 | 26,375,611.00 |
| Connecticut | 4,774,221.00 | 6,400,924.91 | 5,783,139.00 |
| Delaware | 5,597,925.00 | 5,961,864.23 | 4,836,704.00 |
| Florida | 16,806,827.00 | 17,602,011.09 | 17,837,374.00 |
| Georgia | 15,056,177.13 | 16,608,655.26 | 14,384,952.00 |
| Idaho | 11,029,984.67 | 12,493,638.96 | 14,053,282.00 |
| Illinois | 13,401,880.00 | 11,494,833.65 | 12,004,563.00 |
| Indiana | 11,404,385.41 | 11,658,859.91 | 19,175,786.00 |
| Iowa | 21,161,455.00 | 21,145,685.03 | 25,076,733.00 |
| Kansas | 19,269,468.44 | 22,836,843.68 | 23,389,441.00 |
| Kentucky | 10,512,460.00 | 10,555,750.87 | 11,240,067.00 |
| Louisiana | 15,571,529.68 | 23,931,765.83 | 15,731,094.00 |
| Maine | 8,794,873.00 | 10,285,691.51 | 10,687,023.00 |
| Maryland | 7,131,813.91 | 6,596,691.21 | 6,401,732.00 |
| Massachusetts | 5,130,798.00 | 6,703,395.16 | 6,570,442.00 |
| Michigan | 15,305,580.45 | 15,231,855.66 | 15,878,133.00 |
| Minnesota | 27,031,515.34 | 28,233,986.00 | 24,128,400.00 |
| Mississippi | 12,161,261.86 | 18,837,347.88 | 26,876,689.00 |
| Missouri | 18,412,573.75 | 26,904,591.22 | 29,512,639.00 |
| Montana | 21,912,891.24 | 22,107,816.57 | 19,935,799.00 |
| Nebraska | 21,979,690.83 | 23,993,138.09 | 22,700,598.00 |
| Nevada | 6,026,202.00 | 7,546,295.19 | 8,018,510.00 |
| New Hampshire | 4,671,897.00 | 4,866,215.97 | 3,570,465.00 |
| New Jersey | 4,877,634.00 | 5,184,245.01 | 5,066,797.00 |
| New Mexico | 17,899,841.64 | 19,639,292.95 | 22,079,061.00 |
| New York | 13,615,964.86 | 13,264,015.44 | 13,165,947.00 |
| North Dakota | 20,292,594.00 | 16,262,566.46 | 17,945,442.00 |
| Ohio | 15,365,908.91 | 18,572,253.24 | 11,926,214.00 |
| Oklahoma | 21,063,715.48 | 22,061,831.68 | 22,498,919.00 |
| Oregon | 11,760,326.00 | 13,319,099.93 | 15,778,502.00 |
| Pennsylvania | 12,956,931.79 | 12,919,488.21 | 13,547,291.00 |
| Rhode Island | 3,625,678.00 | 3,625,144.79 | 3,236,896.00 |
| South Carolina | 7,476,047.00 | 6,797,616.18 | 8,698,653.00 |
| South Dakota | 14,712,902.00 | 14,780,943.83 | 16,133,345.00 |
| Tennessee | 11,500,699.16 | 11,016,140.84 | 11,392,154.00 |

| State | FY 2009 | FY 2010 | FY 2011 |
|---------------|----------------|----------------|----------------|
| Texas | 64,273,098.06 | 75,950,046.25 | 85,322,032.00 |
| Utah | 15,295,679.00 | 15,491,254.72 | 16,322,511.00 |
| Vermont | 7,322,105.00 | 8,682,731.39 | 9,500,864.00 |
| Virginia | 10,669,061.17 | 11,416,671.62 | 11,833,178.00 |
| Washington | 13,692,274.00 | 15,866,751.77 | 13,229,797.00 |
| West Virginia | 5,748,373.00 | 5,811,210.44 | 7,124,684.00 |
| Wisconsin | 16,496,814.96 | 15,508,192.65 | 16,024,990.00 |
| Wyoming | 11,233,837.98 | 13,924,402.33 | 14,646,814.00 |
| United States | 746,996,812.17 | 833,667,864.75 | 865,568,629.00 |

Appendix 6. Definition and Data Source of Factors in the Baseline

| Factor | Definition | Rationale | Data Source |
|--|---|--|---|
| Grazing Land (1,000 ac.) | Total acres of pastureland, rangeland, and grazed forestland. This includes private, State, Tribal, and other non-federally owned land. | To address livestock related issues and link to the Agency Strategic Goal, “Healthy Plant and Animal Communities” and the PART annual output measure, “Grazing and forest land with conservation applied to protect and improve the resource base”. | NRCS Natural Resources Inventory (NRI), 2007 |
| Irrigated Cropland (ac.) | Land where supplemental water is applied to the soil for crop production, including land watered by artificial or controlled means, such as sprinklers, flooding, furrows or ditches, and sub-irrigation. | To address water management, a national priority and link to the PART long-term outcome measure “Million acre-feet of water conserved,” annual output measure “Land with conservation applied to improve irrigation efficiency” and the Agency Strategic Goal of “Clean and Abundant Water.” | U.S. Census of Agriculture, 2002 |
| Livestock Animal Units (no. of AUEs) | Numbers of Animal Units, by state and size classes. | The 2002 Farm Bill requires 60% of the EQIP funds address livestock related issues. This factor is linked to the Agency Strategic Goals “Clean Air” and “Clean and Abundant Water.” | U.S. Census of Agriculture, 2002 |
| Non-Irrigated Cropland (ac.) | Non-Irrigated cropland is used for the production of adapted crops for harvest and does not include application of supplemental water. | To address soil erosion and soil condition, a national priority as well as water quality. It links to the Agency Strategic Goal, “High Quality, Productive Soils” and the PART long-term outcome measure “Working cropland with improved soil condition” and annual output measure “cropland with conservation applied to improve soil quality”. | U.S. Census of Agriculture, 2002 |
| Cropland Eroding Rates (tons per ac. per year) | Soil erosion rates on cultivated cropland, non-cultivated cropland, CRP land, and pastureland. | To address air, soil and water quality national natural resource priorities. It is linked to the Agency Strategic Goal, “High Quality, Productive Soils,” the PART long-term outcome “Working cropland with improved soil condition” and annual output measure “cropland with conservation applied to improve soil quality”. | NRCS Natural Resources Inventory (NRI), 2007 |
| Impaired Streams 2007 (index) | An index based on the miles of impaired streams and rivers in a state from EPA reports, both 303d and 305b on EPA’s ATTAINS. | To address water quality, a national natural resource priority. It links to the Agency Strategic Goal, “Clean and Abundant Water.” The miles of impaired rivers and streams reflect the interface between water and EQIP-eligible land. | Clean Water Act Section 303 (d) EPA reports, 2007 |

| Factor | Definition | Rationale | Data Source |
|---|--|---|--|
| Wetlands (1,000 ac.) | Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. | To address at-risk species and water quality national priorities and link to the Agency Strategic Goals “Clean and Abundant Water” and “Healthy Plant and Animal Communities.” | NRCS Natural Resources Inventory (NRI), 2007 |
| Farms and Ranches (no.) | Any operation from which \$1000 or more of agricultural products were produced and sold, or normally would have been sold. | To identify NRCS customers in the agriculture sector and serve as a measure of potential workload: the more farms and ranches, the greater the number of potential customers and thus the greater the demand for financial assistance. | U.S. Census of Agriculture, 2002 |
| Forest Land (ac.) | Includes private, State, Tribal, and other non-Federally owned land. | To link to Agency Strategic Goal, “Healthy Plant and Animal Communities” and the PART annual output measure, “Grazing and forest land with conservation applied to protect and improve the resource base.” | NRCS Natural Resources Inventory (NRI), 2007 |
| Specialty Crop Farms (no.) | Number of Farms that grow specialty crops as defined by the Specialty Crops Competitiveness Act of 2004. | Specialty crops typically require more pesticides and fertilizers per acre than conventional crops and pose special environmental concerns. Conservation systems implemented with specialty crop producers are often very complex and require practices with higher per acre costs for installation. | U.S. Census of Agriculture, 2002 |
| At-Risk Species (no.) | Total number of threatened and endangered, proposed and candidate species within a state. Species include vertebrate animals, invertebrate animals, flowering plants, and non-flowering plants. | This factor addresses fish and wildlife, a national natural resource priority. The presence of at-risk species contributes to higher per acre costs for implementing conservation systems. | U.S. Fish & Wildlife Service, Threatened & Endangered Species System (TESS), 2007 |
| Cost of Doing Business (USACE index) | A state by state index based on a representative breakdown of labor, materials, and equipment costs. | In the context of Financial Assistance Programs, this relates to the cost of construction materials for program practice installation. This factor helps to avoid penalizing states in which materials are more expensive. | U.S. Army Corps of Engineers, Civil Works Construction Cost Index System, Table A3, 2008 |
| Air Quality Non-Attainment Areas (index) | Total number of counties where air pollution levels persistently exceed national air quality standards established by the Clean Air Act and reported on the EPA website. Pollutants included in the evaluation are: PM-10, PM-2.5, and 8-hour Ozone. | The presence of non-attainment areas often limits the choice of conservation alternatives and results in higher per acre treatment costs for the conservation systems implemented. It links to the Agency Strategic Goal, “Clean Air.” This factor was developed in consultation with the National Atmospheric Resource Specialist. | EPA Air Quality Non-Attainment Areas, June 2007 |

Appendix 7. Data for Baseline Factors by State

| Financial Assistance | North Carolina | Alabama | Arizona | Arkansas | California | Colorado | Connecticut | Delaware | Florida |
|--|----------------|----------|---------|----------|------------|----------|-------------|----------|----------|
| Grazing Land (1,000 ac.) | 1869.7 | 3537.5 | 32588 | 5205.1 | 18651.4 | 26308.7 | 105.2 | 37.4 | 6269.1 |
| Irrigated Cropland (ac.) | 1172607 | 349642 | 1024476 | 5880117 | 9014904 | 4531522 | 36673 | 266645 | 2038261 |
| Livestock Animal Units (no. of AUEs) | 20542239 | 10620549 | 440517 | 14491574 | 26043064 | 6042901 | 38196 | 25288 | 11752679 |
| Non-Irrigated Cropland (ac.) | 5208071 | 3623968 | 330159 | 5426281 | 2284808 | 8940046 | 160534 | 360034 | 1900083 |
| Cropland Eroding Rates (tons per ac. per year) | 3.4 | 4.3 | 13.4 | 3.2 | 0.8 | 12.9 | 2.5 | 1.9 | 1.5 |
| Impaired Streams 2007 (index) | 1270 | 209 | 79 | 225 | 1021 | 244 | 425 | 101 | 2292 |
| Wetlands (1,000 ac.) | 4718.1 | 3669.5 | 60.1 | 3084 | 1302.3 | 552 | 385.9 | 262.3 | 8364.1 |
| Farms and Ranches (no.) | 53930 | 45126 | 7294 | 47483 | 79631 | 31369 | 4191 | 2391 | 44081 |
| Forest Land (ac.) | 15546700 | 21529400 | 4094800 | 15095900 | 17531900 | 3253300 | 1620400 | 339400 | 13169700 |
| Specialty Crop Farms (no.) | 6379 | 4025 | 2153 | 1387 | 47121 | 1682 | 1577 | 391 | 16343 |
| At-Risk Species (no.) | 64 | 126 | 63 | 34 | 313 | 35 | 20 | 23 | 117 |
| Cost of Doing Business (USACE index) | 0.83 | 0.9 | 0.96 | 0.88 | 1.18 | 0.99 | 1.18 | 1.11 | 0.94 |
| Air Quality Non-Attainment Areas (index) | 7 | 3 | 15 | 1 | 85 | 9 | 10 | 3 | 0 |

| Financial Assistance | Georgia | Idaho | Illinois | Indiana | Iowa | Kansas | Kentucky | Louisiana | Maine | Maryland |
|--|----------|---------|----------|----------|----------|----------|----------|-----------|----------|----------|
| Grazing Land (1,000 ac.) | 2809.7 | 7821.9 | 2249.5 | 1926.1 | 3304.8 | 18285.1 | 5242.1 | 2679.3 | 141.6 | 463.4 |
| Irrigated Cropland (ac.) | 1807305 | 3592927 | 1277726 | 1147817 | 524070 | 8285667 | 444174 | 2034526 | 83299 | 276441 |
| Livestock Animal Units (no. of AUEs) | 21095453 | 2079707 | 7987892 | 25867513 | 55581284 | 3255165 | 6002513 | 2646238 | 61865 | 3323596 |
| Non-Irrigated Cropland (ac.) | 3805757 | 2864089 | 23780417 | 12595872 | 27011182 | 26863745 | 8375603 | 4132696 | 517136 | 1406390 |
| Cropland Eroding Rates (tons per ac. per year) | 4.7 | 4.3 | 3.8 | 3.5 | 5.4 | 3.7 | 2.8 | 2.5 | 1.3 | 2.5 |
| Impaired Streams 2007 (index) | 215 | 916 | 1057 | 1836 | 474 | 1330 | 1300 | 274 | 114 | 184 |
| Wetlands (1,000 ac.) | 6531.2 | 665.3 | 1182.3 | 733.5 | 953 | 841.9 | 446.3 | 10208 | 5626.2 | 955.9 |
| Farms and Ranches (no.) | 49311 | 25017 | 73027 | 60296 | 90655 | 64414 | 86541 | 27413 | 7196 | 12198 |
| Forest Land (ac.) | 21963900 | 4015900 | 3934800 | 3829200 | 2354700 | 1685500 | 10590900 | 13306500 | 17632100 | 2317400 |
| Specialty Crop Farms (no.) | 7154 | 1473 | 3053 | 2875 | 1812 | 1178 | 3489 | 2241 | 1882 | 2033 |
| At-Risk Species (no.) | 76 | 22 | 43 | 36 | 23 | 20 | 50 | 31 | 16 | 30 |
| Cost of Doing Business (USACE index) | 0.9 | 0.95 | 1.14 | 1 | 0.99 | 0.95 | 0.98 | 0.89 | 1 | 0.99 |
| Air Quality Non-Attainment Areas (index) | 15 | 6 | 11 | 3 | 0 | 0 | 3 | 5 | 0 | 12 |

| Financial Assistance | Massachusetts | Michigan | Minnesota | Mississippi | Missouri | Montana | Nebraska | Nevada | New Hampshire |
|--|---------------|----------|-----------|-------------|----------|----------|----------|--------|---------------|
| Grazing Land (1,000 ac.) | 135.4 | 2213.9 | 3759.8 | 3249.3 | 11033.5 | 40913.5 | 24880.5 | 8649 | 107.9 |
| Irrigated Cropland (ac.) | 49444 | 1321034 | 1230161 | 2258344 | 2247667 | 4337642 | 12936732 | 620208 | 12719 |
| Livestock Animal Units (no. of AUEs) | 368351 | 8740195 | 19353172 | 6299306 | 12234647 | 2343611 | 16799340 | 357460 | 207331 |
| Non-Irrigated Cropland (ac.) | 184014 | 7527296 | 22274308 | 4647256 | 17851947 | 16339403 | 14895704 | 193642 | 127096 |
| Cropland Eroding Rates (tons per ac. per year) | 0.9 | 3 | 5.5 | 5 | 4.2 | 4.9 | 4.6 | 3.2 | 1.2 |
| Impaired Streams 2007 (index) | 710 | 2352 | 1144 | 180 | 257 | 604 | 331 | 181 | 1449 |
| Wetlands (1,000 ac.) | 564.8 | 6003.2 | 10876.2 | 4596.4 | 948.6 | 1168.2 | 1183.2 | 386.3 | 499 |
| Farms and Ranches (no.) | 12198 | 53315 | 80839 | 42186 | 106797 | 27870 | 49355 | 2989 | 3363 |
| Forest Land (ac.) | 2589000 | 16568300 | 16541200 | 16826800 | 12430100 | 5488100 | 823700 | 312100 | 3879800 |
| Specialty Crop Farms (no.) | 2160 | 7345 | 4212 | 2304 | 3151 | 860 | 818 | 175 | 857 |
| At-Risk Species (no.) | 26 | 28 | 20 | 46 | 37 | 15 | 19 | 40 | 15 |
| Cost of Doing Business (USACE index) | 1.19 | 1.05 | 1.16 | 0.9 | 1.04 | 0.97 | 0.98 | 1.08 | 1.04 |
| Air Quality Non-Attainment Areas (index) | 1 | 7 | 0 | 1 | 5 | 10 | 0 | 2 | 0 |

| Financial Assistance | New Jersey | New Mexico | New York | North Dakota | Ohio | Oklahoma | Oregon | Pennsylvania |
|--|------------|------------|----------|--------------|----------|----------|----------|--------------|
| Grazing Land (1,000 ac.) | 141 | 40536.3 | 2693.8 | 12213.7 | 2276.4 | 22614.2 | 11098.3 | 2020.1 |
| Irrigated Cropland (ac.) | 180081 | 1033015 | 338772 | 968168 | 246949 | 1339618 | 2446112 | 296379 |
| Livestock Animal Units (no. of AUEs) | 2115717 | 989533 | 4735782 | 1470055 | 32855328 | 8664294 | 3838041 | 25329916 |
| Non-Irrigated Cropland (ac.) | 450775 | 1730308 | 4766704 | 26303660 | 11383814 | 14325804 | 3509760 | 5078169 |
| Cropland Eroding Rates (tons per ac. per year) | 3.3 | 14.5 | 2.1 | 6.1 | 2.5 | 4 | 2.4 | 3.7 |
| Impaired Streams 2007 (index) | 716 | 196 | 528 | 201 | 267 | 723 | 1397 | 6957 |
| Wetlands (1,000 ac.) | 737.4 | 43.9 | 3550.3 | 3493 | 898.7 | 402.9 | 1420.2 | 918.2 |
| Farms and Ranches (no.) | 9924 | 15170 | 37255 | 30619 | 77797 | 83300 | 40033 | 58105 |
| Forest Land (ac.) | 1677700 | 5444500 | 17518900 | 466300 | 7087100 | 7486700 | 12739400 | 15590100 |
| Specialty Crop Farms (no.) | 4021 | 3518 | 7984 | 157 | 6677 | 4444 | 9008 | 8968 |
| At-Risk Species (no.) | 25 | 49 | 33 | 10 | 33 | 22 | 60 | 26 |
| Cost of Doing Business (USACE index) | 1.2 | 0.95 | 1.16 | 0.92 | 1.02 | 0.86 | 1.07 | 1.09 |
| Air Quality Non-Attainment Areas (index) | 34 | 1 | 21 | 0 | 27 | 0 | 4 | 40 |

| Financial Assistance | Rhode Island | South Carolina | South Dakota | Tennessee | Texas | Utah | Vermont | Virginia | Washington |
|--|--------------|----------------|--------------|-----------|----------|---------|---------|----------|------------|
| Grazing Land (1,000 ac.) | 22.1 | 1070.3 | 24279.2 | 4977.6 | 114400.1 | 11593.1 | 308.1 | 2948.3 | 6824.7 |
| Irrigated Cropland (ac.) | 8517 | 343478 | 1552643 | 333149 | 9729337 | 1127827 | 15230 | 447952 | 2745348 |
| Livestock Animal Units (no. of AUEs) | 45335 | 6117806 | 5756513 | 2591493 | 26282481 | 4847582 | 390632 | 4498564 | 5593057 |
| Non-Irrigated Cropland (ac.) | 19543 | 2174442 | 19916953 | 6931775 | 33583072 | 976426 | 565174 | 4095245 | 6215314 |
| Cropland Eroding Rates (tons per ac. per year) | 1.7 | 2.5 | 4.1 | 3.9 | 10.5 | 5 | 1.6 | 3.2 | 9 |
| Impaired Streams 2007 (index) | 120 | 961 | 155 | 1028 | 719 | 156 | 126 | 1523 | 2420 |
| Wetlands (1,000 ac.) | 95.3 | 3698.5 | 2150 | 642.1 | 5164.3 | 1118.4 | 560.5 | 1553.9 | 970.4 |
| Farms and Ranches (no.) | 858 | 24541 | 31736 | 87595 | 228926 | 15282 | 6571 | 47606 | 35939 |
| Forest Land (ac.) | 366700 | 11167900 | 54200 | 11834600 | 10650600 | 1902500 | 4113400 | 13060000 | 12587000 |
| Specialty Crop Farms (no.) | 439 | 3132 | 321 | 4539 | 14234 | 1202 | 1106 | 3742 | 9996 |
| At-Risk Species (no.) | 17 | 43 | 12 | 100 | 94 | 43 | 12 | 69 | 47 |
| Cost of Doing Business (USACE index) | 1.15 | 0.84 | 0.89 | 0.9 | 0.87 | 0.95 | 0.94 | 0.94 | 1.07 |
| Air Quality Non-Attainment Areas (index) | 0 | 1 | 0 | 9 | 19 | 10 | 0 | 9 | 1 |

| Financial Assistance | West Virginia | Wisconsin | Wyoming | United States |
|--|---------------|-----------|---------|---------------|
| Grazing Land (1,000 ac.) | 1440.3 | 3161.4 | 28647.7 | 527735.1 |
| Irrigated Cropland (ac.) | 10797 | 832320 | 1316408 | 94244908 |
| Livestock Animal Units (no. of AUEs) | 1649836 | 6509308 | 1325056 | 443684287 |
| Non-Irrigated Cropland (ac.) | 1171051 | 10342753 | 1448116 | 378853710 |
| Cropland Eroding Rates (tons per ac. per year) | 1.1 | 3.8 | 2.9 | 4.8 |
| Impaired Streams 2007 (index) | 1097 | 593 | 107 | 41108 |
| Wetlands (1,000 ac.) | 98.2 | 5581.1 | 806.4 | 110671.5 |
| Farms and Ranches (no.) | 20812 | 77131 | 9422 | 2128982 |
| Forest Land (ac.) | 10510300 | 14599300 | 963200 | 406410400 |
| Specialty Crop Farms (no.) | 1297 | 5364 | 84 | 225431 |
| At-Risk Species (no.) | 27 | 22 | 18 | 2548 |
| Cost of Doing Business (USACE index) | 1.03 | 1.07 | 0.9 | 50.38 |
| Air Quality Non-Attainment Areas (index) | 4 | 5 | 4 | 406 |

Appendix 8. Normalization to the Total of Baseline Data by State (%)

| Financial Assistance | North Carolina | Alabama | Arizona | Arkansas | California | Colorado | Connecticut | Delaware | Florida |
|--|----------------|---------|---------|----------|------------|----------|-------------|----------|---------|
| Grazing Land (1,000 ac.) | 0.35 | 0.67 | 6.18 | 0.99 | 3.53 | 4.99 | 0.02 | 0.01 | 1.19 |
| Irrigated Cropland (ac.) | 1.25 | 0.37 | 1.09 | 6.25 | 9.58 | 4.81 | 0.04 | 0.28 | 2.17 |
| Livestock Animal Units (no. of AUEs) | 4.77 | 2.47 | 0.10 | 3.37 | 6.05 | 1.40 | 0.01 | 0.01 | 2.73 |
| Non-Irrigated Cropland (ac.) | 1.38 | 0.96 | 0.09 | 1.43 | 0.60 | 2.36 | 0.04 | 0.10 | 0.50 |
| Cropland Eroding Rates (tons per ac. per year) | 1.71 | 2.16 | 6.74 | 1.61 | 0.40 | 6.49 | 1.26 | 0.96 | 0.75 |
| Impaired Streams 2007 (index) | 3.12 | 0.51 | 0.19 | 0.55 | 2.50 | 0.60 | 1.04 | 0.25 | 5.62 |
| Wetlands (1,000 ac.) | 4.26 | 3.32 | 0.05 | 2.79 | 1.18 | 0.50 | 0.35 | 0.24 | 7.56 |
| Farms and Ranches (no.) | 2.53 | 2.12 | 0.34 | 2.23 | 3.74 | 1.47 | 0.20 | 0.11 | 2.07 |
| Forest Land (ac.) | 3.80 | 5.26 | 1.00 | 3.69 | 4.29 | 0.80 | 0.40 | 0.08 | 3.22 |
| Specialty Crop Farms (no.) | 2.89 | 1.83 | 0.98 | 0.63 | 21.38 | 0.76 | 0.72 | 0.18 | 7.42 |
| At-Risk Species (no.) | 2.98 | 5.86 | 2.93 | 1.58 | 14.56 | 1.63 | 0.93 | 1.07 | 5.44 |
| Cost of Doing Business (USACE index) | 1.73 | 1.88 | 2.00 | 1.83 | 2.46 | 2.06 | 2.46 | 2.31 | 1.96 |
| Air Quality Non-Attainment Areas (index) | 1.74 | 0.74 | 3.72 | 0.25 | 21.09 | 2.23 | 2.48 | 0.74 | 0.00 |

| Financial Assistance | Georgia | Idaho | Illinois | Indiana | Iowa | Kansas | Kentucky | Louisiana | Maine | Maryland |
|--|---------|-------|----------|---------|-------|--------|----------|-----------|-------|----------|
| Grazing Land (1,000 ac.) | 0.53 | 1.48 | 0.43 | 0.36 | 0.63 | 3.47 | 0.99 | 0.51 | 0.03 | 0.09 |
| Irrigated Cropland (ac.) | 1.92 | 3.82 | 1.36 | 1.22 | 0.56 | 8.80 | 0.47 | 2.16 | 0.09 | 0.29 |
| Livestock Animal Units (no. of AUEs) | 4.90 | 0.48 | 1.86 | 6.01 | 12.92 | 0.76 | 1.40 | 0.62 | 0.01 | 0.77 |
| Non-Irrigated Cropland (ac.) | 1.01 | 0.76 | 6.28 | 3.33 | 7.13 | 7.10 | 2.21 | 1.09 | 0.14 | 0.37 |
| Cropland Eroding Rates (tons per ac. per year) | 2.36 | 2.16 | 1.91 | 1.76 | 2.72 | 1.86 | 1.41 | 1.26 | 0.65 | 1.26 |
| Impaired Streams 2007 (index) | 0.53 | 2.25 | 2.59 | 4.50 | 1.16 | 3.26 | 3.19 | 0.67 | 0.28 | 0.45 |
| Wetlands (1,000 ac.) | 5.90 | 0.60 | 1.07 | 0.66 | 0.86 | 0.76 | 0.40 | 9.22 | 5.08 | 0.86 |
| Farms and Ranches (no.) | 2.32 | 1.18 | 3.43 | 2.83 | 4.26 | 3.03 | 4.06 | 1.29 | 0.34 | 0.57 |
| Forest Land (ac.) | 5.37 | 0.98 | 0.96 | 0.94 | 0.58 | 0.41 | 2.59 | 3.25 | 4.31 | 0.57 |
| Specialty Crop Farms (no.) | 3.25 | 0.67 | 1.39 | 1.30 | 0.82 | 0.53 | 1.58 | 1.02 | 0.85 | 0.92 |
| At-Risk Species (no.) | 3.53 | 1.02 | 2.00 | 1.67 | 1.07 | 0.93 | 2.33 | 1.44 | 0.74 | 1.40 |
| Cost of Doing Business (USACE index) | 1.88 | 1.98 | 2.38 | 2.08 | 2.06 | 1.98 | 2.04 | 1.85 | 2.08 | 2.06 |
| Air Quality Non-Attainment Areas (index) | 3.72 | 1.49 | 2.73 | 0.74 | 0.00 | 0.00 | 0.74 | 1.24 | 0.00 | 2.98 |

| Financial Assistance | Massachusetts | Michigan | Minnesota | Mississippi | Missouri | Montana | Nebraska | Nevada | New Hampshire |
|--|---------------|----------|-----------|-------------|----------|---------|----------|--------|---------------|
| Grazing Land (1,000 ac.) | 0.03 | 0.42 | 0.71 | 0.62 | 2.09 | 7.75 | 4.71 | 1.64 | 0.02 |
| Irrigated Cropland (ac.) | 0.05 | 1.40 | 1.31 | 2.40 | 2.39 | 4.61 | 13.75 | 0.66 | 0.01 |
| Livestock Animal Units (no. of AUEs) | 0.09 | 2.03 | 4.50 | 1.46 | 2.84 | 0.54 | 3.90 | 0.08 | 0.05 |
| Non-Irrigated Cropland (ac.) | 0.05 | 1.99 | 5.88 | 1.23 | 4.72 | 4.32 | 3.93 | 0.05 | 0.03 |
| Cropland Eroding Rates (tons per ac. per year) | 0.45 | 1.51 | 2.77 | 2.52 | 2.11 | 2.46 | 2.31 | 1.61 | 0.60 |
| Impaired Streams 2007 (index) | 1.74 | 5.77 | 2.81 | 0.44 | 0.63 | 1.48 | 0.81 | 0.44 | 3.55 |
| Wetlands (1,000 ac.) | 0.51 | 5.42 | 9.83 | 4.15 | 0.86 | 1.06 | 1.07 | 0.35 | 0.45 |
| Farms and Ranches (no.) | 0.57 | 2.50 | 3.80 | 1.98 | 5.02 | 1.31 | 2.32 | 0.14 | 0.16 |
| Forest Land (ac.) | 0.63 | 4.05 | 4.04 | 4.11 | 3.04 | 1.34 | 0.20 | 0.08 | 0.95 |
| Specialty Crop Farms (no.) | 0.98 | 3.33 | 1.91 | 1.05 | 1.43 | 0.39 | 0.37 | 0.08 | 0.39 |
| At-Risk Species (no.) | 1.21 | 1.30 | 0.93 | 2.14 | 1.72 | 0.70 | 0.88 | 1.86 | 0.70 |
| Cost of Doing Business (USACE index) | 2.48 | 2.19 | 2.42 | 1.88 | 2.17 | 2.02 | 2.04 | 2.25 | 2.17 |
| Air Quality Non-Attainment Areas (index) | 0.25 | 1.74 | 0.00 | 0.25 | 1.24 | 2.48 | 0.00 | 0.50 | 0.00 |

| Financial Assistance | New Jersey | New Mexico | New York | North Dakota | Ohio | Oklahoma | Oregon | Pennsylvania | Rhode Island |
|--|------------|------------|----------|--------------|------|----------|--------|--------------|--------------|
| Grazing Land (1,000 ac.) | 0.03 | 7.68 | 0.51 | 2.31 | 0.43 | 4.29 | 2.10 | 0.38 | 0.00 |
| Irrigated Cropland (ac.) | 0.19 | 1.10 | 0.36 | 1.03 | 0.26 | 1.42 | 2.60 | 0.31 | 0.01 |
| Livestock Animal Units (no. of AUEs) | 0.49 | 0.23 | 1.10 | 0.34 | 7.64 | 2.01 | 0.89 | 5.89 | 0.01 |
| Non-Irrigated Cropland (ac.) | 0.12 | 0.46 | 1.26 | 6.95 | 3.01 | 3.78 | 0.93 | 1.34 | 0.01 |
| Cropland Eroding Rates (tons per ac. per year) | 1.66 | 7.29 | 1.06 | 3.07 | 1.26 | 2.01 | 1.21 | 1.86 | 0.86 |
| Impaired Streams 2007 (index) | 1.76 | 0.48 | 1.30 | 0.49 | 0.65 | 1.77 | 3.43 | 17.07 | 0.29 |
| Wetlands (1,000 ac.) | 0.67 | 0.04 | 3.21 | 3.16 | 0.81 | 0.36 | 1.28 | 0.83 | 0.09 |
| Farms and Ranches (no.) | 0.47 | 0.71 | 1.75 | 1.44 | 3.65 | 3.91 | 1.88 | 2.73 | 0.04 |
| Forest Land (ac.) | 0.41 | 1.33 | 4.28 | 0.11 | 1.73 | 1.83 | 3.11 | 3.81 | 0.09 |
| Specialty Crop Farms (no.) | 1.82 | 1.60 | 3.62 | 0.07 | 3.03 | 2.02 | 4.09 | 4.07 | 0.20 |
| At-Risk Species (no.) | 1.16 | 2.28 | 1.53 | 0.47 | 1.53 | 1.02 | 2.79 | 1.21 | 0.79 |
| Cost of Doing Business (USACE index) | 2.50 | 1.98 | 2.42 | 1.92 | 2.13 | 1.79 | 2.23 | 2.27 | 2.40 |
| Air Quality Non-Attainment Areas (index) | 8.44 | 0.25 | 5.21 | 0.00 | 6.70 | 0.00 | 0.99 | 9.93 | 0.00 |

| Financial Assistance | South Carolina | South Dakota | Tennessee | Texas | Utah | Vermont | Virginia | Washington | West Virginia |
|--|----------------|--------------|-----------|-------|------|---------|----------|------------|---------------|
| Grazing Land (1,000 ac.) | 0.20 | 4.60 | 0.94 | 21.68 | 2.20 | 0.06 | 0.56 | 1.29 | 0.27 |
| Irrigated Cropland (ac.) | 0.36 | 1.65 | 0.35 | 10.34 | 1.20 | 0.02 | 0.48 | 2.92 | 0.01 |
| Livestock Animal Units (no. of AUEs) | 1.42 | 1.34 | 0.60 | 6.11 | 1.13 | 0.09 | 1.05 | 1.30 | 0.38 |
| Non-Irrigated Cropland (ac.) | 0.57 | 5.26 | 1.83 | 8.87 | 0.26 | 0.15 | 1.08 | 1.64 | 0.31 |
| Cropland Eroding Rates (tons per ac. per year) | 1.26 | 2.06 | 1.96 | 5.28 | 2.52 | 0.80 | 1.61 | 4.53 | 0.55 |
| Impaired Streams 2007 (index) | 2.36 | 0.38 | 2.52 | 1.76 | 0.38 | 0.31 | 3.74 | 5.94 | 2.69 |
| Wetlands (1,000 ac.) | 3.34 | 1.94 | 0.58 | 4.67 | 1.01 | 0.51 | 1.40 | 0.88 | 0.09 |
| Farms and Ranches (no.) | 1.15 | 1.49 | 4.11 | 10.75 | 0.72 | 0.31 | 2.24 | 1.69 | 0.98 |
| Forest Land (ac.) | 2.73 | 0.01 | 2.89 | 2.60 | 0.47 | 1.01 | 3.19 | 3.08 | 2.57 |
| Specialty Crop Farms (no.) | 1.42 | 0.15 | 2.06 | 6.46 | 0.55 | 0.50 | 1.70 | 4.54 | 0.59 |
| At-Risk Species (no.) | 2.00 | 0.56 | 4.65 | 4.37 | 2.00 | 0.56 | 3.21 | 2.19 | 1.26 |
| Cost of Doing Business (USACE index) | 1.75 | 1.85 | 1.88 | 1.81 | 1.98 | 1.96 | 1.96 | 2.23 | 2.15 |
| Air Quality Non-Attainment Areas (index) | 0.25 | 0.00 | 2.23 | 4.71 | 2.48 | 0.00 | 2.23 | 0.25 | 0.99 |

| Financial Assistance | Wisconsin | Wyoming |
|--|-----------|---------|
| Grazing Land (1,000 ac.) | 0.60 | 5.43 |
| Irrigated Cropland (ac.) | 0.88 | 1.40 |
| Livestock Animal Units (no. of AUEs) | 1.51 | 0.31 |
| Non-Irrigated Cropland (ac.) | 2.73 | 0.38 |
| Cropland Eroding Rates (tons per ac. per year) | 1.91 | 1.46 |
| Impaired Streams 2007 (index) | 1.45 | 0.26 |
| Wetlands (1,000 ac.) | 5.04 | 0.73 |
| Farms and Ranches (no.) | 3.62 | 0.44 |
| Forest Land (ac.) | 3.57 | 0.24 |
| Specialty Crop Farms (no.) | 2.43 | 0.04 |
| At-Risk Species (no.) | 1.02 | 0.84 |
| Cost of Doing Business (USACE index) | 2.23 | 1.88 |
| Air Quality Non-Attainment Areas (index) | 1.24 | 0.99 |

Appendix 9. 2008 NRCS Farm Bill Conservation Programs

| Program | Introduction |
|--|---|
| Agricultural Management Assistance Program (AMA) | Provides financial and technical assistance to agricultural producers to voluntarily address issues such as water management, water quality, and erosion control by incorporating conservation into their farming operations. |
| Chesapeake Bay Watershed Initiative (CBWI) | Helps farmers, ranchers and forestland owners voluntarily install conservation practices on hundreds of thousands of acres to help support rural economies, protect wildlife habitat and improve water quality in the Chesapeake Bay Watershed. |
| Cooperative Conservation Partnership Initiative (CCPI) | Enables the use of certain conservation programs along with resource of eligible partners to provide financial and technical assistance to owners and operators of agricultural and nonindustrial private forest lands. |
| Conservation of Private Grazing Land Program | Ensures technical, educational, and related assistance is provided to those who own private grazing lands. |
| Conservation Reserve Program (Farm Service Agency) | Helps agricultural producers use environmentally sensitive land for long-term, resource-conserving covers to improve the quality of water, control soil erosion, and develop wildlife habitat. |
| Conservation Stewardship Program (CSP) | Encourages producers to address resource concerns in a comprehensive manner by undertaking additional conservation activities and Improving, maintaining, and managing existing conservation activities. |
| Environmental Quality Incentives Program (EQIP) | Provides financial and technical assistance to agricultural producers through contracts up to a maximum term of ten years in length. |
| Agricultural Water Enhancement Program (AWEP) | Provides financial and technical assistance to agricultural producers to implement agricultural water enhancement activities on agricultural land to conserve surface and ground water and improve water quality. |
| Conservation Innovation Grants (CIG) | Stimulates the development and adoption of innovative conservation approaches and technologies while leveraging Federal investment in environmental enhancement and protection, in conjunction with agricultural production. |
| Farm and Ranch Lands Protection Program (FRPP) | Provides matching funds to help purchase development rights to keep productive farm and rangeland in agricultural uses. |
| Grassland Reserve Program (GRP) | Emphasizes support for working grazing operations, enhancement of plant and animal biodiversity, and protection of grassland under threat of conversion to other uses. |
| Healthy Forest Reserve Program (HFRP) | Assist landowners in voluntarily restoring, enhancing and protecting forestland resources on private lands through easements. |
| Small Watershed Rehabilitation Program | Assistances for the planning, design, and implementation of rehabilitation projects of upgrading or removing aging dams so that they do not pose a threat to life and property. |
| Wetlands Reserve Program (WRP) | Offers landowners financial and technical support to protect, restore, and enhance wetlands on their property. |
| Wildlife Habitat Incentive Program (WHIP) | Supports conservation-minded landowners to develop and improve wildlife habitat on agricultural land, nonindustrial private forest land, and Indian land. |

Appendix 10. Conservation Programs Addressing Water and Land Conservation in FY 2011 (in USD)

(excluding EQIP)

| State | Agricultural Water Enhancement Program | Water Conservation | | | Land Conservation | | | | | |
|---------------|--|--------------------|-------------------------------------|-----------------|---------------------------|----------------|--------------------------------|-----------------|--------------------------|----------------|
| | | AWE Percentage | Chesapeake Bay Watershed Initiative | CBWI Percentage | Grassland Reserve Program | GRP Percentage | Healthy Forest Reserve Program | HFRP Percentage | Wetlands Reserve Program | WRP Percentage |
| Alabama | 733000 | 1.24 | | | 722000 | 1.32 | | | 9988000 | 1.92 |
| Alaska | | | | | | | | | | |
| Arizona | | | | | 3000 | 0.01 | | | 5000 | 0.00 |
| Arkansas | 1855000 | 3.13 | | | 600000 | 1.10 | 9000 | 0.06 | 11048000 | 2.12 |
| California | 18154000 | 30.67 | | | 2137000 | 3.92 | 599000 | 3.72 | 34784000 | 6.67 |
| Colorado | 1030000 | 1.74 | | | 1301000 | 2.38 | | | 1473000 | 0.28 |
| Connecticut | | | | | 962000 | 1.76 | | | 37000 | 0.01 |
| Delaware | | | 3374000 | 5.68 | 127000 | 0.23 | | | 303000 | 0.06 |
| Florida | 759000 | 1.28 | | | 2054000 | 3.76 | | | 97698000 | 18.74 |
| Georgia | 1319000 | 2.23 | | | 516000 | 0.95 | 2230000 | 13.86 | 9320000 | 1.79 |
| Hawaii | | | | | 1234000 | 2.26 | | | 42000 | 0.01 |
| Idaho | 4323000 | 7.30 | | | 9716000 | 17.80 | | | 2495000 | 0.48 |
| Illinois | | | | | 788000 | 1.44 | | | 6828000 | 1.31 |
| Indiana | 1212000 | 2.05 | | | 435000 | 0.80 | 1495000 | 9.29 | 14034000 | 2.69 |
| Iowa | 102000 | 0.17 | | | 986000 | 1.81 | | | 35612000 | 6.83 |
| Kansas | 4430000 | 7.49 | | | 1930000 | 3.54 | | | 4559000 | 0.87 |
| Kentucky | | | | | 1007000 | 1.84 | 1248000 | 7.75 | 8161000 | 1.57 |
| Louisiana | | | | | 212000 | 0.39 | | | 40463000 | 7.76 |
| Maine | | | | | | | | | 428000 | 0.08 |
| Maryland | | | 12501000 | 21.04 | | | | | 6903000 | 1.32 |
| Massachusetts | | | | | | | | | 3675000 | 0.70 |
| Michigan | 3160000 | 5.34 | | | 911000 | 1.67 | 161000 | 1.00 | 3160000 | 0.61 |
| Minnesota | 935000 | 1.58 | | | 250000 | 0.46 | | | 26057000 | 5.00 |
| Mississippi | 2825000 | 4.77 | | | 265000 | 0.49 | 77000 | 0.48 | 19339000 | 3.71 |
| Missouri | | | | | 1415000 | 2.59 | | | 15393000 | 2.95 |
| Montana | 412000 | 0.70 | | | 1267000 | 2.32 | | | 1821000 | 0.35 |
| Nebraska | 4684000 | 7.91 | | | 704000 | 1.29 | | | 12797000 | 2.45 |
| Nevada | | | | | 618000 | 1.13 | | | 3321000 | 0.64 |
| New Hampshire | 125000 | 0.21 | | | 157000 | 0.29 | | | 2927000 | 0.56 |

| | | | | | | | | | | |
|----------------|----------|--------|----------|--------|----------|--------|----------|----------|-----------|--------|
| New Jersey | 28000 | 0.05 | | | | | | 1072000 | 0.21 | |
| New Mexico | 316000 | 0.53 | | | 30000 | 0.05 | | 1461000 | 0.28 | |
| New York | 83000 | 0.14 | 3366000 | 5.67 | 764000 | 1.40 | | 3750000 | 0.72 | |
| North Carolina | 2391000 | 4.04 | | | 395000 | 0.72 | | 7348000 | 1.41 | |
| North Dakota | | | | | 846000 | 1.55 | | 32671000 | 6.27 | |
| Ohio | | | | | 748000 | 1.37 | 25000 | 0.16 | 6659000 | 1.28 |
| Oklahoma | 1100000 | 1.86 | | | 1500000 | 2.75 | 3513000 | 21.83 | 8062000 | 1.55 |
| Oregon | 2429000 | 4.10 | | | | | 5699000 | 35.41 | 3874000 | 0.74 |
| Pennsylvania | | | 19016000 | 32.00 | 503000 | 0.92 | 88000 | 0.55 | 8602000 | 1.65 |
| Puerto Rico | | | | | | | | | | |
| Rhode Island | | | | | 21000 | 0.04 | | 121000 | 0.02 | |
| South Carolina | | | | | 281000 | 0.51 | 950000 | 5.90 | 7327000 | 1.41 |
| South Dakota | 170000 | 0.29 | | | 2529000 | 4.63 | | 19415000 | 3.72 | |
| Tennessee | | | | | 573000 | 1.05 | | 18103000 | 3.47 | |
| Texas | 5274000 | 8.91 | | | 3616000 | 6.62 | | 16115000 | 3.09 | |
| Utah | | | | | 162000 | 0.30 | | 1457000 | 0.28 | |
| Vermont | | | | | 548000 | 1.00 | | 482000 | 0.09 | |
| Virginia | | | 16305000 | 27.44 | 915000 | 1.68 | | 1069000 | 0.21 | |
| Washington | 632000 | 1.07 | | | 346000 | 0.63 | | 904000 | 0.17 | |
| West Virginia | | | 4854000 | 8.17 | 589000 | 1.08 | | 532000 | 0.10 | |
| Wisconsin | | | | | 777000 | 1.42 | | 8289000 | 1.59 | |
| Wyoming | 702000 | 1.19 | | | 9123000 | 16.71 | | 1313000 | 0.25 | |
| United States | 59183000 | 100.00 | 59416000 | 100.00 | 54583000 | 100.00 | 16094000 | 100.00 | 521297000 | 100.00 |