Targeting and the
Environmental Quality Incentive Program

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EXECUTIVE SUMMARY

In this paper, we analyzed how well the initial allocations made under the Environmental Quality Incentive Program (EQIP) addressed the environmental problems identified by the government and key stakeholders. The government defined 27 environmental and other variables which it weighted according to livestock and non-livestock issues. It took these variables into consideration when distributing the EQIP cost-share funds to the states. The variables can be grouped into categories such as soil erosion, water quality/quantity, grazing, animal waste, wetland and wildlife issues, as well as flooding threats and "special" consideration (including farms and ranches, native American tribal land and limited resource producers).

We first determined the distribution of EQIP funds on a state level. We then weighted each formula variable by the total weight used in the formula. The Spearman's Correlation Coefficient was used to see which variables are correlated with the funding distribution of EQIP 1997. Additionally, we summed the weighted variables into the categories to determine whether these general environmental concerns are targeted through EQIP fund allocation to the states. We then ranked the categories according to "severity" and compared them to the percentage of EQIP funds received by each state in 1997. Lastly, we selected certain environmental problems from the 27 formula variables and conducted the same ranking. Findings include:

- Texas, Montana, Missouri, Kansas and Minnesota received the highest percentage of EQIP allocation, even though Montana and Kansas did not score very high on the environmental problem scale.
- Since EQIP 1997 was a transitional year for the new conservation program, the funding did not deviate much from ACP 1994 and 1995 average allocations by design.
- EQIP correlates extremely well with the formula variables used to distribute money to the states as well as with the environmental problem categories. The states receiving the most EQIP cost-share funds generally also have more environmental problems.
- Some exceptions exist, particularly for the states which are arid and do not have many farms or ranches and. In some cases, the livestock that they do raise pose waste disposal problems.

Next Steps

- We will track EQIP's performance over the next few years, expecting an increase in success in targeting as time passes since 1997 was a transitional year for the program.
- We will determine which regions target better than others in their priority area determination.
- We will examine EQIP's performance on a county level to determine whether EQIP targets environmental problems.
- We will adjust the weights assigned to each formula variable to see if and where the program could be improved.

INTRODUCTION

Federal soil conservation policies and farm programs have existed for over half a century. The major programs were designed during the Great Depression. Most conservation programs have focused on reducing soil erosion, building on the first soil erosion programs which provided relief from the severe economic conditions of the 1930s by paying farmers to idle erosive land (Batie, 1985). Through most of the farm bills' history, conservation programs allowed two goals to be pursued simultaneously: 1) the maintenance of farm income; and 2) soil conservation. The purpose of this study is to compare the funds that were distributed under the now obsolete Agricultural Conservation Program (ACP) and the newly implemented Environmental Quality Incentive Program (EQIP). Specifically, this report includes: 1) a brief summary of ACP and EQIP; 2) a brief comparison between the fund distribution process of ACP and EQIP; 3) an econometric analysis of the relationship between soil erosion and water quality issues and ACP/EQIP fund distribution on a state-by-state and county-by-county level; 4) a discussion about the resource shifts between ACP and EQIP; 5) a geographic information system (GIS) comparison of funding changes in the Lake and Corn Belt states; and 6) policy implications.

ECONOMIC JUSTIFICATIONS FOR SOIL CONSERVATION

There are many reasons for conserving the nation's natural resources, especially its soil. Market failure, including externalities and inadequate institutional arrangements, is one of the most important reasons for public soil erosion conservation programs (Easter and Cotner, 1981). Soil conservation goals are not well served by markets because of both the difference in time preference between individuals and society as well as distorted capital markets. Time preference refers to the decision making process of an individual comparing present advantages versus future advantages. Farmers are generally present-time oriented while society makes decisions with future generations in mind. Because of age and income, farmers will try to maximize their current income and will more readily discount the need for future soil productivity than society at large will. Additionally, the externality concerns of soil erosion have become a focus in recent years. The resulting off-site damages (soil deposition on neighboring land, excess sediment downstream, etc.) must be taken into consideration when determining the of soil conservation.

Furthermore, institutions also influence farmers' adoption of soil conservation measures on their farms. Land ownership and tenure arrangements are the primary factors. As renting increases as a way to stay in farming, rental agreements will become more important in determining how farmers will protect the soil on their farms. As Easter and Cotner (1981) observe, the direct financial involvement of the landowner in the farm operation seems to be an important consideration in the conservation decisions. Data collected during the 1970s suggest that non-farm operators and landowners who do not share in the risk of farming are less likely to make investments to maintain the productivity of the soil on their farms. Therefore, under passive ownership and tenure arrangements, soil conservation is likely to be less than society would choose (Easter and Cotner, 1981).

SOIL EROSION AND FEDERAL PROGRAMS

Although soil erosion was still a concern starting with the 1990 Farm Bill, water quality issues (especially nonpoint-source water quality) began to emerge in the agricultural policy debate. This emphasis on nonpoint-source water quality issues stemmed from several sources. First, soil erosion issues were less urgent, due to the successes of the Conservation Reserve Program (CRP) as well as conservation compliance implemented in the 1985 Farm Bill (Norris and Clark, 1995). Also, point-source pollution had been largely regulated and was no longer seen as a pressing problem, thus, policy attention turned to environmental problems stemming from agricultural production.[1] In addition, research suggested that off-site water quality damages exceeded on-farm productivity damages by several magnitudes (Ribaudo, 1986).

[1]Nonpoint-source pollution is any pollution where the source of the pollutants cannot be readily identified.

Federal commodity programs were primarily designed to support farm income and maintain an expanding agriculture. Existing farm programs have not been designed to encourage environmentally enhancing practices, with the exception of conservation compliance provisions that require the adoption of certain farming practices on lands with highly erodible soils. In fact, agricultural and environmental policies are frequently inconsistent with one another (Reichelderfer, 1990). The reason for this inconsistency primarily lies in the fact that each set of policies has evolved separately. As Reichelderfer points out, "the institutions charged with developing and implementing agricultural policies often are not those responsible for environmental policies affecting agriculture (1990).

Farm programs are administered by the federal government while most environmental policies are largely administered by state and local governments. Additionally, the environmental community and the agricultural community typically have different perceptions about the role of the federal government regarding issues within their domain. As pointed out by Carriker and Abdalla (undated draft paper), agriculture conventions emphasize voluntary compliance and incentives while the conventions in environmental matters primarily favor regulation.[2] The 1996 Federal Agricultural Improvement and Reform Act (FAIR) attempts to deal with these inconsistencies. Before addressing the changes implemented in the 1996 Farm Bill, the primary conservation program of the federal government will be overviewed briefly.

THE AGRICULTURAL CONSERVATION PROGRAM–AN OVERVIEW

The 1970s

The Agricultural Conservation Program (ACP) was initiated in 1936 as the Department of Agriculture's primary cost-sharing program. ACP was the principal channel through which the federal government assisted farmers and ranchers with the cost of implementing conservation practices on their land to help maintain the productivity of American agriculture. The primary objective of the ACP as stated by the Agricultural Stabilization and Conservation Service (ASCS, now the Farm Service Agency or FSA) which administered the program was to cost-share with public funds the performance of enduring soil and water conservation measures on farmland that the farmer would not perform without cost-sharing (GAO, 1977). This would theoretically result in soil and water conservation beyond that which the farmer would otherwise achieve with his/her own resources.

The ACP was carried out by ASCS in the field by state committees that operated at ASCS state offices and at ASCS county offices. Each state committee was comprised of three to five members who were appointed by the Secretary of Agriculture as well as the state director of the Agricultural Extension Service. The county committees were under the direction of the state committee and included three farmers elected by the farmers in a specific county and the county extension agent. The other agency involved in ACP was the Soil Conservation Service (SCS, now the Natural Resources Conservation Service or NRCS). SCS provided technical assistance to farmers in implementing conservation practices and gave technical advice to the committees.

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[2] The price support system guarantees farmers the support price on a portion of the farm's production potential as established by set-aside requirements and past yields. The target price, another form of income support, is designed to cover only the participating farmers acres and is based on the yield per acre. The target price policy has been fixed in this manner since the 1985 Farm Bill. Deficiency payments based on target prices as well as Non-Recourse Loans were essentially designed to support farm income. These programs are based on the average yield per acre of a certain crop and the number of "base" acres on a given farm. The primary consequence of this policy has been to encourage farmers to grow program supported crops in order to retain the "base." Additionally, farmers have been encouraged to increase yields, resulting in higher irrigation and, therefore, higher groundwater depletion and higher soil erosion. Increased use of fertilizer to obtain a higher yield can result in an increased level of soil and groundwater contamination. Furthermore, crop rotation as a management practice is discouraged, especially when support prices are high.

Unfortunately, recent studies evaluating the ACP are not readily available in the literature. However, in 1977, the General Accounting Office (GAO) conducted a study evaluating conservation programs including the ACP. At that time less than half of the cost-share expenditures supported conservation measures which were oriented toward soil conservation. In fact, most of the available ACP funds went toward measures which, though eligible for cost-share, were primarily targeted toward increased production or resulted in minimal soil conservation benefits. For example, before 1976, state and county committees selected the conservation practices to be cost-shared under ACP. There were approximately 60 nationally approved conservation practices which were eligible for cost-share funds which included many that were mainly production oriented practices or had little or no conservation benefits. In subsequent years, ASCS consolidated some of the measures into broader categories and eliminated others to bring the program more in line with its original objective.

By 1974, the list of eligible practices had shrunk to 14, with drainage systems and liming cropland, which were production oriented, eliminated.[3] Additionally, temporary practices as well as practices to beautify the land were also eliminated. Despite these steps, however, the trend throughout the six-year period was away from cost-sharing primarily [for] soil conservation-oriented practices (GAO, 1977). In October 1975, legislation was approved to allow all of the 1970 nationally accepted practices to be eligible for cost-sharing under ACP.

Thus, ACP provided cost-share funds and technical assistance to farmers who implemented approved conservation and environmental protection practices on their agricultural lands. Until 1985, uniform cost-sharing was the general rule. Between 50 percent to 70 percent was generally applied for cost-share subsidies, regardless of the particular situation on the farm. The characteristics of the land, the rate of erosion on the field or the specific Best Management Practice (BMP) applied was not considered in the funding computation. GAO's evaluation in 1977 found that it did not make much difference whether counties were allocated ACP funds based on their conservation needs or based on the expenditure in the previous year. The greater portion of the ACP funds were provided to practices which had only temporary erosion control benefits or which were based on increasing agricultural production. These practices generally benefited farmers financially, and were therefore in high demand, but were not necessarily needed for effective erosion control.

Cost-share funds were generally allocated to individual states based on ASCS estimates of the amount of funds needed for soil and water conservation. These estimates included the cost for practices, which did not provide environmental benefits as well as for those that did benefit soil erosion. By law (16 U.S.C 590o), each state [was] to receive an annual allocation of appropriated funds proportionate to its conservation needs as shown by the estimate, except that a state's share may not be reduced by more than 15 percent from its share for the previous year (GAO, 1977). This may explain why the county allocations varied little over time as we see when ACP county allocations are analyzed.

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[3] Part of the financial assistance under ACP had gone toward installing drainage systems on wet cropland (about 10 percent in 1975). Farmers wanted drainage systems for one or more of the following reasons: (1) to farm wet areas previously unfit for farming, (2) to ensure access to the fields, or (3) to improve yields. According to a University of Minnesota Extension Service study, the return on investment could be between 10 percent and 15 percent in a typical cropping situation and as high as 35 percent. The application of lime to cropland primarily improves production. About 6 percent of available cost-share was spent on this practice in 1975 (GAO, 1975).

As the GAO reported, county committees generally assigned priorities to practices for which ACP funds were to be spent, however, these priorities were frequently not followed. In fact, practices, which received high priority by the county committees because of their erosion control sometimes only received a small percentage of available cost-share funds. On the other hand, practices which enhanced production or were of a temporary nature were approved by the county committees and heavily funded due to farmer demand. The GAO cites a case where, during a five year period, 52 percent of ACP funds in a particular county were spent on the installation of drainage tile in wet cropland, and only 27 percent of available funds went to areas where cost-share money was critically needed for erosion control practices, such as terracing or contour stripping. In another example, one Great Plains county spent 54 percent of its ACP appropriation on the reorganization of irrigation systems and less than 1 percent on the establishment of permanent vegetative covers, even though the county had determined vegetative covers were a priority need for wind erosion control. The farmers in that county, however, were more interested in obtaining financial assistance to improve their irrigation systems. The examples the GAO found continue. In general, the production oriented focus of targeting ACP funds increased whenever the commodity programs were trying to cut support back, thus each program justified the existence of the other (Leman, 1982).

The first internal evaluation conducted by ASCS in 1980, 44 years after ACP's creation, also found serious targeting problems. Many practices had been funded by ACP on land that had only minor erosion problems. In fact, more than half of all practices were put on land with a soil loss from sheet and rill erosion of less than five tons of soil annually which is considered an acceptable loss, and only 21 percent of the practices were established on land with an annual soil loss rate of more than 14 tons per acre per year.[4]

Table 1
Conservation Practice Adoption by Severity of Sheet and Rill Erosion, ACP, 171 Sample Counties 1975-1978

Soil Loss (tons/acre)	Distribution of Practices (%)
0-4.9	52
5-9.9	19
10-14.9	11
19-29.9	11
30 and over	7

Source: Easter and Cotner. Evaluation of Current Soil Conservation Strategies.

Additionally, the funding procedure was generally based on political boundaries rather than areas most in need of soil erosion conservation practices (Leman, 1982). A partial answer can perhaps be found in the fact that an organized lobby for soil conservation was practically nonexistent at the time. As Libby and Birch point out, there is no equivalent to the dairy lobby in the soil conservation business.

The ACP in the 1980s and Beyond

Since the 1985 Farm Bill, more and more cost-share funds have been provided to agricultural conservation practices directed to support water quality, rather than to soil erosion issues. In the 1985 Farm Bill, USDA modified the ACP in several ways to increase cost effectiveness of the program. These efforts came in response to evidence that in the early 1980s the majority of cost-share funds had been focused on areas with minor erosion problems where the cost per unit of erosion reduction was relatively high (Park and Monteith, 1989). Thus, targeting cost-share funds to address environmental problems was not of primary con-

[4]Soil loss of five tons per acre per year (t/a/yr)or less is generally not considered serious since with proper management soil productivity can be maintained. Additionally, on land, which erodes at an annual rate of more than 14 t/a/yr, erosion reduction costs were found to be less than $1 per ton. On the other hand, the cost per ton of erosion reduction was $4 to $45 per ton on land with less than five t/a/yr soil loss.

cern. Targeting is defined as the selection of critical regions, such as a watershed, critical land within the region, farms, particular environmental problems, or specific practices for agricultural production for the implementation of programs. To the extent that environmental programs have been targeted in the past, most have addressed soil erosion problems. Relatively little has been done to target environmental programs to achieve off-site soil and water quality improvements.

Throughout much of the history of soil conservation policies, the programs were targeted to soil erosion problems, exclusive of the magnitude of the problem or the impact on productivity. However, even if targeting were focused at reducing the higher soil erosion rates, such programs would not usually be the most effective way to improve ground and surface water quality, nor wildlife habitat, primarily because the areas with high erosion rates may be different from the areas where other agro-environmental problems are of concern. In fact, targeting highly erosive soil may not even be associated with productivity losses since certain areas may be highly erosive yet have a deep layer of fertile soil. Therefore, these regions may not experience significant productivity losses (Ribaudo, 1986; Batie, 1986).

Targeting could be based on an entire watershed, as was the case in a study conducted by Park and Sawyer (1983), which targeted soil erosion. This study focused on the special Agricultural Conservation Program (ACP) in the North Fork of the Forked Deer Watershed. The program required that participating farms enter long-term agreements based on whole-farm conservation plans, which were designed to reduce soil erosion on each field for a period of three to 10 years. Two questions were addressed by this study: 1) to what extent did the targeted area and long-term agreement increase the cost efficiency of soil erosion control efforts?; and 2) how much potential remained within this framework for further increases in cost efficiency? The findings indicate that targeting to a critical watershed can provide significant increases in the cost efficiency of soil erosion control measures and that the potential for additional improvements are possible if targeting is focused on highly erosive soil within a critical watershed.

Therefore, ACP funds were supposed to have been targeted to highly erodible watersheds and counties starting with the 1985 Farm Bill. However, targeting to highly erodible counties and watersheds did not ensure that Best Management Practices (BMP) were applied to the most vulnerable fields within these areas. Counties could thus use the funds to their discretion (i.e.; where highly erodible land in their counties was identified). With this variable cost-share option, cost-sharing rates were higher on areas: 1) where the initial erosion rate was higher for the field to be treated; 2) where the percentage reduction achieved in the erosion rate by the BMP to be applied was higher; and 3) where the soil loss tolerance (T-value) of the soil was lower (Park and Monteith, 1989, p. 173). The cost-share rate was determined by multiplying the percent reduction in erosion with an appropriate predetermined weighing factor. If the initial erosion rate was lower than the T-value, no cost-share funds were available.

ENVIRONMENTAL INCENTIVE PROGRAM–OVERVIEW

Drawbacks of the ACP, such as lack of appropriate targeting, high costs, and a top-down approach to determine which areas receive funds and technical assistance, were addressed in the 1996 Farm Bill. As part of the 1996 Farm Bill, Congress passed the Environmental Quality Incentive Program (EQIP) which is the new cost-share program assisting farmers in the adoption of conservation practices. EQIP replaces four conservation programs: 1) the Agricultural Conservation Program (ACP); 2) the Water Quality Incentives Program (WQIP); 3) the Great Plains Conservation Program (GPCP); and 4) the Colorado River Basin Salinity Control Program (CRSCP), all of which ceased to exist in April 1996.

EQIP addresses soil erosion, water quality degradation and related natural resource concerns. It is based on voluntary, incentive-based approaches through technical, financial and educational assistance. Contrary to ACP, EQIP is based on priority area agro-environmental problems, which are watersheds, regions or areas of special environmental sensitivity. The priority areas are selected from the “bottom-up” (i.e.; the process of selection begins with local groups consisting of representatives from conservation district board members, NRCS, Farm Service Agency (FSA), the Cooperative State Research, Education, and Extension Service, as well as other interested local groups). These local work groups conduct a conservation needs assessment and, based on that assessment, develop a conservation proposal for priority areas submitted to the NRCS State Conservationists. Contrary to ACP, EQIP targets funding to areas most in need of conservation.

Additionally, 50 percent of EQIP funding is targeted to livestock related natural resource concerns. Although the construction of animal waste storage facilities for large confined livestock operations is not eligible, cost-share may be paid for other conservation practices. NRCS expects over 10,000 small and medium sized livestock operations to be assisted through EQIP. As with ACP, cost-share is available for up to 75 percent of conservation practices such as grassed waterways, filter strips, manure management, integrated pest management, irrigation water management and wildlife habitat management. It is estimated that 35.7 million acres of agricultural land will be treated over the seven years of the program, including 18.5 million acres of cropland, 3.7 million acres of pasture and 13.5 million acres of rangeland. An estimated 26.8 million acres are expected to be in priority areas (USDA, 1997, p. 2). The targeting of funds for EQIP is for priority areas (65 percent) and statewide natural resource concerns (35 percent).

Additionally, in fiscal year 1997, USDA told us they would allocate EQIP money to the states with a 5 percent floor and a 30 percent ceiling in relation to previous years ACP payments. What that means is that no state for fiscal year 1997 could theoretically decline by more than 5 percent below the last ACP payment, nor could any state get an increase over 30 percent above the last ACP payment. This does include the WQIP as this program was part of the ACP allocations.

Producer Eligibility

FSA determines which producers are eligible for cost-share payments under EQIP. Eligibility is limited to individuals who operate a livestock facility or are otherwise engaged in agricultural production. While small- and medium-sized livestock facilities are eligible for cost-share funds, large facilities are not eligible for financial assistance to construct animal waste management storage and treatment facilities. However, for large animal waste facilities, there are funds available for other conservation practices on the livestock farm. For example, certain elements used to remove animal waste from a treatment or storage facility to other locations where it is used properly is considered a practice eligible for cost-share funds. A confined livestock operation is considered large if the farm has 1,000 animal units in confinement. However, the definition of a large livestock facility can be changed by the chief of NRCS upon request of the NRCS State Conservationist with the State Technical Committee. However, as of this date, we are not aware of any state which has recommended amending this definition (Schulz, 1997).

Calculation of Animal Units

EQIP counts the number of animals as a function of animal units. NRCS provides a conversion sheet for easy conversion from livestock numbers to units. However, the conversion process requires knowledge of the weight of each animal category in order to calculate the conversion to animal units. The table in Appendix 1 provides the animal units for most major livestock species raised in confinement.

A producer located in a priority area may have resource concerns outside the focus of a particular priority area. In this situation, a farmer is eligible for financial assistance through the particular priority area as well as through the statewide Natural Resource Concern, provided the proposed conservation plan addresses problems in both the geographic priority area and the Natural Resource Concern. A farmer cannot, however, receive double payments for one specific conservation practice and only one contract per tract of land is permitted. This restriction means that a farmer could enter one contract for a specific tract of land for the priority area and a contract for a different tract of land for the statewide Natural Resource Concern. In a situation where two priority areas overlap, a farmer who is located in the overlapping area can apply for financial assistance in both areas, as long as the contracts are for different tracts on the farm.

Conservation Plans

Every farmer who wishes to enter into a contract to receive financial assistance through EQIP must provide a comprehensive conservation plan approved by NRCS and the Conservation District in his or her area. There are two different types of conservation plans; a Progressive Plan and a Resource Management System (RMS). The latter is a conservation plan, which takes into account soil, water, air, plant and animal resources, as well as social, cultural and economic concerns. This conservation plan is likely to receive a higher ranking in the competitive process to receive cost-share payments under EQIP. However, for many reasons, not all conservation plans are at the level of a RMS. If the conservation plan does not meet the quality criteria for RMS, which are included in the NRCS Field Office Technical Guide, the plan is referred to as a progressive plan. It is advisable, however, to attempt to achieve a conservation plan which is considered a RMS because as determined in the 1996 Farm Bill, financial assistance programs such as EQIP are to accomplish the most environmental benefit for the money spent.

Bottom-Up Versus Top-down Approaches to Conservation Programs

As discussed above, ACP was a top-down program in which people at the top of the government (i.e.; NRCS and FSA at the federal government level, made decisions regarding which areas of the country would receive how much federal financial assistance). The money was dispersed to the state government agencies, who, in turn, distributed the funds to the county level, and to the farms, which had entered into agreements through ACP. EQIP, on the other hand, is designed to be a bottom-up program in which the local entities make the decision as to where the agro-environmental priorities are located. There are certain advantages and disadvantages to both approaches.

Top-Down Approach

The top-down approach envisions a central group at the top, relying on self-generated information and ordering the priorities for the agencies as a whole. Such a decision-making process has at least three advantages:

1. It facilitates the creation of comprehensive categories, which can be related to existing program definitions. The result of the priority setting for the agencies can then be expected to be understandable in the context of current structures in the organizations and it is easy to communicate to top decision makers.

2. The relationship of the results to the overall program budgeting process leaves microscale decisions on allocation of efforts *within* existing programs in the hands of lower-level managers.

3. The top-down approach is relatively inexpensive in terms of demands on time.

The top-down approach has at least two major disadvantages:

1. The policy areas to be ranked are generally so aggregated that they become difficult to evaluate, (e.g. nonpoint-source discharges to surface or groundwater and pesticides in sediments). Policy options for intervention are difficult to define and the resulting consequences of allocating greater or lesser resources to the different program areas are difficult to predict.

2. The relative degree of heterogeneity of the benefit/resource-expenditure ratios within program areas cannot be evaluated; by default, programs are evaluated on an average benefit per average cost basis, rather than the theoretically correct incremental benefit per incremental cost basis (this assumes ... that the policy options under consideration are more likely to be incremental changes in program allocations, rather than the establishment or abolishment of whole programs) (Hattis and Goble, 1994, p. 110-111).

Issues such as uniformity, consistency of standards and equal treatment of producers among different regions are the most important rationale for the involvement of the federal government in any conservation program. Additionally, there is a need for accurate and detailed scientific information. State and local governments may not have the personnel capable of providing data on all agro-environmental problems or the financial resources to carry out the necessary tasks of data collection and analysis. The dissemination of data by the federal government could reduce the cost and duplication of these tasks. Furthermore, the top-down approach with federal government involvement may be in a better position to assist states and localities in the review of climatic and geologic conditions, which influence agro-environmental problems. For example, the extent of erosion as well as nitrogen and pesticide leaching and runoff is dependent, in part, on the geology and climate of the region. Another role for the federal government may be the development of an adequate mechanism for states to translate research results, provide calculations on risk assessments and standardized guidelines.

Bottom-Up Approach

The primary justification for a bottom-up approach involving state and local governments as well as interested farmers and environmental groups is that agro-environmental problems are site-specific or regional, not national per se. The localities and states may have a better understanding of the agricultural patterns in the states and counties as well as the agricultural production and conservation practices and could be in a better position to intensely study the agro-environmental problems in the regions. There are some common advantages in the bottom-up approach to policy making:

- Any effort to enhance and improve the agencies productivity as well as the benefits of conservation in the regions most affected by agriculture will need to pay attention to conserving and enhancing the skills and dedication of their experienced professional field staff. This can only be achieved by actively involving the people affected in evaluating the best use of their limited resources. (As Hattis and Goble (1994) put it: A pure top-down strategy, in which the troops receive their marching orders from on high without direct and personal involvement, risks major and very costly defections in cases where there are important mismatches between the interests, motivations, capabilities, and priorities of individuals and the dictates from the top commanders.)

- The bottom-up approach will yield more in the way of specific guidance in questions such as is air pollution a bigger problem than water pollution in our area?

- Institutional learning and accountability will be facilitated since the actual results of resource allocations can be more easily evaluated after particular conservation projects, selected on the basis of targeting priority areas, are actually completed.

- The bottom-up approach will provide information on the potential gains and losses that may result from incremental changes in specific resource allocations.

On the other hand, there are disadvantages to a strict bottom-up approach:

- It will not lend itself to global estimates of the potential of various conservation as a whole (i.e. this approach is better equipped to assess the consequences of incremental changes of conservation programs).

- Indirect effects of program activities regarding non-targeted problems will be difficult to evaluate and, therefore, tend to be neglected (Hattis and Goble, 1994).

Data Requirements and Methodology

This section will describe the data collection and the methodology for the econometric analysis and cartographic mapping (ArcView) to determine:

- Whether a relation exists between certain environmental indicators and ACP and EQIP spending for the years 1995 and 1996 (ACP) and 1997 (EQIP).
- Whether a relation exists between the number of farms and the environmental need and ACP1995 and EQIP spending.
- Where the resource shifts between ACP and EQIP are.

The purpose of the analysis is to determine whether the spending patterns for agro-environmental problems have shifted such that resource allocations reflect the actual problems in the states and counties in the United States. As outlined in the previous sections, ACP spending was generally allocated on the basis of political boundaries rather than actual environmental problems. EQIP was designed to eliminate the politics behind conservation spending with a bottom-up approach. Did this approach achieved the intended objective? The data can be grouped into three categories:

1. ACP and EQIP

- ACP state allocations for the years 1992, 1994, 1995 and 1996 (1996 also included the interim EQIP allocations).
- EQIP state allocation.
- ACP county allocations (amount earned) for the years 1995 and 1996.
- EQIP county allocations for 1997.

The data for the ACP allocations were collected by contacting all state Farm Service Agency (FSA) offices in all states. The collection period extended from the beginning of July to the middle of November 1997. For the EQIP 1997 county allocation data, all state Natural Resource Conservation offices were contacted by telephone. The collection period was approximately from October to mid November. The reason for the delay in EQIP fund allocation on a county basis was because once the state technical committees had determined the priority areas and statewide concern, the sign-up for farmers to enter into contracts extended through the summer of 1997. The process of allocating funds to individual counties took a while for FSA to finish.

2. Number of Farms and Agricultural Land

Number of farms on a county-by-county basis. The variable was extracted from the 1992 Census of Agriculture, Geographic Area Series 1B, U.S. Summary and County Level Data, U.S. Department of Commerce, Economic and Statistics Administration, Bureau of the Census.

3. NRI Environmental Indicators[5]

- Acres of erosion by water for 1992 by county for the Corn Belt and the Great Lake States.
- Acres of erosion by wind for 1992 by county for the Corn Belt and the Great Lake States.
- Average tons per acre per year of water erosion in 1992 by county for the Corn Belt and the Great Lake States.
- Average tons per acre per year of wind erosion in 1992 by county for the Corn Belt and the Great Lake States.
- 1992 acres (in hundreds) of streams less than 1/8 mile wide.

The economic indicator variables were provided by Dr. Rich Greene, Department of Geography, Northern Illinois University from the Natural Resources Inventory (NRI).[5]

The econometric analysis will focus on the Great Lake States and the Corn Belt. First, a multiple regression analysis will be conducted and the following hypotheses will be tested: (1) ACP allocations are poorly correlated with the environmental indicators; (2) EQIP allocations are poorly correlated with environmental indicators; (3) ACP allocations are poorly correlated with the number of farms and the acreage of farmland; and (4) EQIP is poorly correlated with the number of farms and the acreage of farmland.

Econometric Analysis

Statistics in Brief

A brief explanation of the statistical values to analyze the validity of the models follows, including the significance of the coefficient of determination (R^2), the F-statistic, the significant F, the t-statistic, the significant t and the Standard Error of the estimate.

R^2

The coefficient of determination is supposed to represent the proportion of the variation in the dependent variable "explained" by variation in the independent variable. The variation of the variable can be thought of as the distance of the observed value of the dependent variable to the predicted value of the variable. It is zero if the best fit regression line passes through that point. Because the method of ordinary least squares (OLS) to analyze the relationship between the dependent variable and the independent variables, minimizes the sum of squared residuals (the unexplained variation) it automatically maximizes the R^2. Thus, if all the observations fall on the regression line the R^2 is one, meaning the regression is a perfect fit. If, on the other hand, none of the observations fall on the regression line, then the R^2 is zero, meaning the independent variables did not explain any of the variations of the dependent variable around its mean.

[5] The 1992 National Resources Inventory (NRI) is a "snapshot" of resource conditions in the United States as of the 1992 growing season. It is one of a series of inventories conducted at five-year intervals by the U. S. Department of Agriculture's Natural Resources Conservation Service (NRCS). The NRI is the most comprehensive database ever assembled on natural resources on the non-federal lands of the United States–74 percent of the nation's land area. The database includes data from three inventory years–1982, 1987, and 1992. Its focus is on soil, water and related resources on our nation's farms and non-federal forests and grazing lands.

F-Test and Significant F
The F-test serves to test how well the regression equation fits the data. The F-statistic can be calculated by dividing the mean square regression by the mean square residual.[6] It basically tests the hypothesis that R^2 is equal to zero. If the probability associated with the F-statistic is small and the observed significance level (the significant F) is less than 0.00005, the hypothesis that R^2 is equal to zero is rejected. Therefore, it is also a test to see whether the estimates on the independent variables are zero.

t-Test and Significant t
The t-test basically tests the hypothesis that the estimate for a specific independent variable is zero. It is similar to the F-statistic in that it is the square root of the F-value. If the calculated t-value (using SPSS econometrics software package) is greater or equal to the student t-value (found in any good econometrics text book), the hypothesis that the estimate for a particular variable is equal to zero is rejected, which means that this particular variable is significant in the explanation of the dependent variable. The general rule from the student t-test table is that if the calculated t is greater than 1.96, the decision rule is to reject. The significant t-value basically makes the decision as to whether or not a variable is significant. As it approaches zero, or is equal to zero, the independent variable is significant.

Standard Error of the Estimate (SE)
The standard error of the estimate shows the smallest value that occurs when one of the independent variables (say X_1) is equal to its mean (or average). The larger the distance from the mean, the greater the standard error.

The Models
The first set of regression will include all above mentioned states on a county basis, and the second set of regressions will be conducted with state totals for ACP and EQIP allocations. Ordinary Least Squares (OLS) regression will be used for all equations as the data meets OLS requirements. The independent variables were normalized to the natural logarithm due to severe skewness. The general hypothesis is that ACP county distribution for both years (1995, 1996) was based more on political boundaries than on environmental indicators and the number of farms in each county.[7] Additionally, since the redesign of the cost-share program, the hypothesis is that EQIP will be better explained by environmental indicators.

The Econometric Model
The first analysis shows the extent to which ACP 1995 and 1996 allocations and EQIP county allocation for 1997 were determined by acres of erosion by water for 1992 by county (WEROSION), acres of erosion by wind for 1992 by county (WIEROSIO), average tons per acre per year of water erosion in 1992 by county (TAYWTR), average tons per acre per year of wind erosion in 1992 by county (TAYWIND) and 1992 acres (in hundreds) of streams less than 1/8 mile wide (STREAM) as well as the number of farms in each county (FARMS). The equations can be expressed as follows:

$$LGACP95 = C + ß_{FARMS} + ß_{wierosio} + ß_{STREAM} + ß_{TAYWTR} + ß_{TAYWIND} + ß_{WEROSION}$$
$$LGACP96 = C + ß_{FARMS} + ß_{wierosio} + ß_{STREAM} + ß_{TAYWTR} + ß_{TAYWIND} + ß_{WEROSION}$$
$$LGEQIP97 = C + ß_{FARMS} + ß_{wierosio} + ß_{STREAM} + ß_{TAYWTR} + ß_{TAYWIND} + ß_{WEROSION.}$$

[6] The mean square for each observation is the sum of squares divided by the degrees of freedom. In other words, it is the total observed variability in the dependent variable attributable to the regression equation. Degrees of freedom are the number of observation in the sample (in our case the number of counties) minus one.

[7] Although the number of farms in each county as well as the land in farms has been collected, high multicollinearity is assumed. Therefore, only the number of farms will be included in the regression equation.

ACP 1995
The resulting equation for ACP95 indicates that the best regressed fit explains less than 10 percent of the variance in the counties, which received ACP payments. Table 2 summarizes the results:

Table 2
The Natural Log for ACP 95
Regressed on Environmental Indicators and Number of Farms

Variable	ß	Standard Error ß	t	Significant t
STREAM	0.002	0.002	1.06	0.29
TAYWIND	-0.03	0.03	-1.03	0.3
TAYWTR	-0.09	0.04	-2.32	0.021
WEROSION	7.47E-05	1.21E-05	6.16	0
WIEROSIO	-1.86E-05	9.01E-06	-2.07	0.04
FARMS	-8.9E-05	2E-05	-4.5	0
Constant	10.02	0.12	81.4	0
F = 11.66	**Significant F = 0**	**R^2 = 0.087**	**Adjusted R^2 = 0.08**	

The coefficient of determination (R^2) indicates that the best regressed fit explains nearly 10 percent of the variation in the counties, which received ACP payments in 1995.[8] The F-statistic indicates that the model is significant, although it does not explain much of the variation in the dependent variable. In fact, only the variables of water erosion and the number of farms are significant. The direction of the variables, however, needs to be analyzed further. The sign for WEROSION is positive, indicating that the more water erosion in the counties, the more ACP was allocated. FARMS, on the other hand is negative, which demonstrates that the fewer farms there are in the counties, the more ACP funds were allocated. Intuitively, more farms should have meant more ACP payments. The constant (the intercept which estimates the average value of ACP 1995 allocations when the independent variables are zero) is also statistically significant, confirming we have explained 10 percent of the variation.

ACP 1996
Table 3 summarizes the output for the regression of ACP county allocations in 1996 on the above independent variables:

Table 3
The Natural Log of ACP96 Regressed on Environmental Indicators and Number of Farms

Variable	ß	Standard Error ß	t	Significant t
STREAM	0.004	0.002	1.64	0.1
TAYWIND	9.2E-04	0.03	0.03	0.98
TAYWTR	-0.11	0.05	-2.53	0.012
WEROSION	9.75E-05	1.33E-05	7.34	0
WIEROSIO	1.79E-6	9.86E-06	0.18	0.86
FARMS	-1.5E-05	2.18E-05	-0.68	0.49
Constant	9.52	0.13	70.74	0
F = 15	**Significant F = 0**	**R^2 = 0.11**	**Adjusted R^2 = 0.10**	

[8]The coefficient of determination indicates the explanatory power of the regression model. It records the proportion of variation in the dependent variable (ACP95) explained by the independent variables.

Although the model is highly significant according to the F-statistic, the best fit regression only explains 11 percent of the variation in the dependent variable, ACP county allocation in 1996. The results for the independent variables are similar to those in 1995 with the exception of the number of farms, which is now insignificant. This result is encouraging, since the ACP county allocations in 1996 were supposed to take water quality into account and it includes the interim EQIP county allocation which should have been independent of the number of farms in a specific county.

EQIP 1997

Table 4 summarizes the results for the regression model for EQIP allocation in 1997.

Table 4
The Natural Log of EQIP97
Regressed on Environmental Indicators and Number of Farms

Variable	ß	Standard Error ß	t	Significant t
STREAM	0.003	0.007	0.52	0.61
TAYWIND	-4.05	0.089	-0.52	0.6
TAYWTR	-0.28	0.14	-2.1	0.041
WEROSION	2.48E-04	4.01E-05	6.18	0
WIEROSIO	-7.28E-05	2.98E-05	-2.44	0.015
FARMS	-5.28E-05	6.57E-05	-0.8	0.42
Constant	6.94	0.41	17.1	0
F = 12.70	**Significant F = 0**	**R^2 = 0.09**	**Adjusted R^2 = 0.087**	

Regressing EQIP county allocation on the environmental indicators indicates that, although the regression model is significant, the best regressed fit explains only 9 percent of the variation in counties receiving EQIP payments. The only significant variables are WEROSION (although not in the expected direction). This is despite the fact that EQIP was based on priority areas, which were, in most cases, based on watersheds but were also designed to take into account soil erosion. The variable number of farms is insignificant, indicating that the new allocation process did not take into account how many farms there are in the counties, as the ACP 1995 allocation did.

It could be concluded, that EQIP county allocations cannot be explained well by environmental variables. Additionally, the coefficients for all three models are extremely low. The question now becomes: What can explain the county allocation of ACP 1995, ACP 1996 and EQIP 1997?

Political Influences

To attempt to answer this question, dummy variables were constructed to account for potential correlation between county payments and possible political effects, in particular, political boundaries. It is assumed that political boundaries made a difference when allocating ACP funds for the years 1995 and 1996 but made little or no difference for EQIP allocation in 1997. Specifically, each state was assigned a dummy variable, with Missouri omitted as a base state to avoid multicollinearity because the intercept variable was included in the equations.[9] Again, each dependent variable was regressed separately. The regression models were constructed as follows:

$LGACP95 = C + ß_{FARMS} + ß_{wierosio} + ß_{STREAM} + ß_{TAYWTR} + ß_{TAYWIND} + ß_{WEROSION} + ß_{IA} + ß_{IL} + ß_{IN} + ß_{MI} + ß_{MN} + ß_{OH} + ß_{WI}$.

[9] A dummy variable is an artificial variable constructed such that it takes the value one whenever the qualitative phenomenon it represents occurs and zero otherwise. Missouri is chosen randomly as the base state to which the others are compared. The dummy variable coefficients for the remaining states measure the extent to which they differ from this base.

$LGACP96 = C + ß_{FARMS} + ß_{wierosio} + ß_{STREAM} + ß_{TAYWTR} + ß_{TAYWIND} + ß_{WEROSION} + ß_{IA} + ß_{IL} + ß_{IN} + ß_{MI} + ß_{MN} + ß_{OH} + ß_{WI}$.

$LGEQIP97 = C + ß_{FARMS} + ß_{wierosio} + ß_{STREAM} + ß_{TAYWTR} + ß_{TAYWIND} + ß_{WEROSION} + ß_{IA} + ß_{IL} + ß_{IN} + ß_{MI} + ß_{MN} + ß_{OH} + ß_{WI}$.

ACP 1995

The resulting equation for ACP95 is highly significant, with an F-statistic of 16 and indicates that the best regressed fit explains more than the equations without the dummy variable (i.e.; 22 percent of the variance in the counties which received ACP payments in 1995). Table 5 summarizes the results:

Table 5
LGACP95 Regressed on Environmental Indicators, Number of Farms and States

Variable	ß	Standard Error ß	T	Significant t
STREAM	0.002	0.002	1.1	0.28
TAYWIND	0.059	0.029	2.06	0.04
TAYWTR	-0.04	0.043	-0.87	0.38
WEROSION	5.79E-05	1.4E-05	4.14	0
WIEROSIO	-8.32E-06	8.8E-06	-0.95	0.34
FARMS	9E-05	3.99E-05	2.26	0.024
IA	-1.08	0.19	-5.86	0
IL	-2.17	0.31	-6.91	0
IN	-0.49	0.18	-2.73	0
MI	-0.89	0.21	-4.3	0
MN	-1.91	0.22	-8.58	0
OH	-0.67	0.18	-3.66	0
WI	-0.42	0.19	-2.16	0.031
Constant	10.5	0.16	63.65	0
F = 15.58	**Significant F = 0**	**R^2 = 0.22**	**Adjusted R^2 = 0.20**	

The environmental indicators are not statistically significant, with the exception of water erosion. The inclusion of dummy variables for the states, which is a proxy for political influences, improves the explanatory power of the model considerably.[10] The effect of political boundaries appears to play a rather large effect on the way ACP funds were allocated in 1995. Once the effects of the independent variables (STREAM, TAYWIND, TAYWTR, WEROSION, WIEROSIO and FARMS) are controlled, the average ACP county allocation in 1995 was affected by which state it was in. It can be concluded that state boundaries did influence ACP allocations in 1995. Additionally, the signs for all included state dummy variables are negative, indicating that Missouri received significantly more ACP funds than the seven other states.

ACP 1996

Next, we test the same hypothesis for ACP 1996. Since interim EQIP is included in the data, the dummy variables for the sates should have less effect on the distribution of ACP funds. Table 6 summarizes the result of the regression model of ACP on the environmental indicators, the number of farms and the states. Again, Missouri was omitted as a base state.

[10]Missouri was randomly chosen as the Baseline State.

Table 6
LGACP96 Regressed on Environmental Indicators, Number of Farms and States

Variable	ß	Standard Error ß	t	Significant t
STREAM	9.5E-04	0.002	0.45	0.66
TAYWIND	0.021	0.031	0.66	0.51
TAYWTR	-0.032	0.047	-0.68	0.5
WEROSION	5.68E-05	1.53E-05	3.71	0
WIEROSIO	-3.53E-06	9.61E-06	-0.37	0.71
FARMS	1.14E-04	4.35E-05	2.61	0.009
IA	-0.77	0.2	-3.83	0
IL	-1.88	0.34	-5.5	0
IN	-2.1	0.2	-10.6	0
MI	-1.02	0.23	-4.5	0
MN	-0.82	0.24	-3.36	0
OH	-1.21	0.2	-6.1	0
WI	-0.77	0.21	-3.65	0
Constant	10.51	0.18	58.38	0
F = 17.50	**Significant F = 0**	**R^2 = 0.24**	**Adjusted R^2 = 0.23**	

Nearly the same results can be inferred from the regression of ACP96 on all environmental indicators, the number of farms and the dummy variables for the states. The F-statistic indicates that the model is significant and the best fit regression explains 24 percent of the variation in the allocation of ACP payments to counties in 1996. None of the environmental indicators are significant, with the exception of acres of erosion by water. As water erosion increases, more ACP funds are distributed. Again, as expected, the county boundaries are a large influence in the decision process as to which counties received ACP payments. As in the ACP 1995 allocations of cost-share funds, the seven other states received significantly less money than Missouri, explained by the negative signs of the variables.

EQIP 1997

The last model will regress EQIP allocations for 1997 on all environmental indicators as well as on the number of farms and, again, the dummy variables for political boundaries. The conjecture that states should not have a large influence is given, based on the new process of allocating cost-share money to counties. Table 7 summarizes the resulting equation:

Table 7
LGEQIP Regressed on Environmental Indicators, Number of Farms and States

Variable	ß	Standard Error ß	t	Significant t
STREAM	0.001	0.007	0.2	0.84
TAYWIND	-0.15	0.1	-1.5	0.14
TAYWTR	-0.04	0.15	-0.28	0.78
WEROSION	1.23E-04	4.89E-05	2.66	0.008
WIEROSIO	-7.22E-05	3.04E-05	-2.34	0.02
FARMS	1.78E-04	1.4E-04	1.27	0.2
IA	2.62	0.65	4.1	0
IL	-1.1	1.1	-0.96	0.34
IN	-0.11	0.63	-0.18	0.86
MI	0.76	0.72	1.05	0.29
MN	1.35	0.78	1.73	0.084
OH	-0.98	0.63	-1.54	0.12
WI	1.11	0.68	1.65	0.1
Constant	6.57	0.58	11.4	0
F = 8.45	**Significant F = 0**	**R^2 = 0.13**	**Adjusted R^2 = 0.12**	

Although the model is significant, this regression equation clearly does not explain much of the variance in the dependent variable (LGEQIP97). The R^2 is still relatively low at 13 percent. The only significant variables are water erosion (WEROSION) and the state dummy variable for Iowa. It is worthy of noting, however, that the significant t-values are closer to zero than in the preceding models. It can be concluded that the average EQIP funding for 1997 in the counties in question are not significantly different from the base state Missouri once the effects for the other independent variables are controlled. However, Iowa appears to receive more EQIP funds than Missouri. Furthermore, it can then be concluded, that state boundaries, in general, do not influence EQIP allocation.

Targeting Once More

It has been established that the Agricultural Conservation Program (ACP) has not been targeted to environmental concerns, nor was it specifically designed to do so. However, the Environmental Quality Incentive Program which replaced the ACP in the 1996 Farm Bill was designed to target specific environmental problems (i.e.; priority areas in the states, as well as manure problems and statewide concerns). It has been suggested, however, that the bottom-up approach to establish these priority areas still falls short of targeting the most important agro-environmental problems. Farmers as well as environmental groups and state resource specialists determined where to target cost-share funds. It has been suggested that farmers and other interested parties are not the most qualified people to determine the priority areas due to limited knowledge regarding the environmental problems on a statewide basis (personal communication, Batie, 1997). However, the regression equations above suggest that the county allocation of EQIP 1997 is different from the ACP county allocations for both 1995 and 1996. The states are not as significant as they were for ACP. Thus, some targeting to agro-environmental does appear to occur.

Although the regression models above have shown that the equations were different from each other, a simple test was performed to determine whether EQIP funds capture the areas that the states were most concerned about targeting. Since ACP was not targeted to environmental concerns, and EQIP is supposed to be targeted, a t-test was carried out to ascertain whether the two conservation programs are, in fact, significantly different from each other. Thus, the hypothesis tested is that ACP 1995 and EQIP 1997 are significantly different from each other. If this hypothesis is true, then EQIP is, in fact, more targeted.[11] The same states' allocations for ACP95 and EQIP97 were tested (Corn Belt and Great Lake States). The results indicate that the t-value (1.023) is less than 1.96 for the confidence interval of 95 percent.[12] Thus we must accept the hypothesis that EQIP allocations for 1997 are not significantly different from the ACP allocation for 1995. This result shows that the distribution for EQIP and ACP for 1995, in general, were close to each other and, therefore, EQIP is not targeted as it was assumed it would be by design. A partial explanation for this result may be the upper and lower limits FSA has put on the allocation of EQIP.

Discussion Regarding Outliers

Examining the distribution of ACP allocations in 1995 and examining the outliers which resulted from the model without taking the natural log is an important indicator as to which counties received considerably more funding for ACP 1995, ACP 1996 and EQIP 1997.

ACP 1995 Outliers

Conducting a casewise plot of the standardized residual for ACP95 found 12 outliers.[13] These counties received proportionately more ACP funds in 1995 adjusting the mean ACP95 value upward. Upon further examination the counties are:[14]

Indiana	Michigan	Minnesota	Missouri	Wisconsin
Ripley	Lenawee	Stearns	Clinton	Brown
			Dallas	Monroe
			DeKalb	
			Knox	
			Lewis	
			Ralls	
			Stoddard	

ACP 1996 Outliers

Once more, outliers are examined when looking at the ACP 1996 allocations:

Missouri	Minnesota	Michigan
Chariton	Stearns	Huron
Clinton		Sanilac
Dallas		
DeKalb		
Osage		
Saline		
Stoddard		
Webster		
Wright		

[11]ACP allocations for 1995 are selected for this test because the allocations for 1996 already contain the interim EQIP allocations, and a strong relationship is assumed.

[12]The equation used was as follows: the mean of EQIP97 minus the mean of ACP95 divided by the square root of the variance of EQIP97 divided by the sample number (737) plus the variance of ACP95 divided by the sample number (737). Thus (46,377.51 - 43137.49) / the square root of (6,901,276.9 + 3,129,155.199) = 3240/3167 = 1.023. The decision rule is to reject the hypothesis if the calculated t-value is greater than 1.96, which it is clearly not.

[13]Outliers were not a problem when regressing the models of ACP allocations in 1995 and 1996 as well as EQIP in 1997, because the natural log of these dependent variables normalized the funds such that it resulted in a normal distribution without the skewness.

[14] A discussion of the results including the outlier counties can be found in Appendix 2.

Even though ACP 1996 included the interim EQIP allocation when the program was phased out, it can be concluded that the assumption made above is false. Specifically, the ACP 1996 allocations were just as influenced by the political variables as the ACP allocation in 1995. Once the outliers were removed from the regression equation, the R^2 slightly improved, but the significance of the independent variables did not change considerably. Thus, it can be concluded that the model has approximately the same explanatory power as the model with the outliers included in the equation.

EQIP 1997 Outliers
When the regression was performed without the natural logarithm of the dependent variable, the casewise plot of the standardized residuals gives further insight of potential problems in the model other than skewness in the distribution of the allocation of ACP in 1995. Ten outliers were found in the distribution of EQIP allocations for 1997:

Illinois Michigan	Minnesota	Missouri	Wisconsin
Cumberland	Lenawee	Fillmore	Howell
		Olmsted	McDonald
		Rice	Stoddard
		Winona	Rock

For EQIP allocations in 1997, we will examine whether the outliers are located in priority areas, which may explain why certain counties receive more EQIP payments than others.

We have called the outlying counties to determine why they received more ACP payments in 1995 and 1996. Resource Conservation Specialists of the county NRCS offices were contacted by telephone to determine why the counties received more ACP payments than the remaining counties in the states.

Indiana
Ripley County in Indiana received considerably more ACP funding in 1995. The county applied for excess ACP funding that was available in the state (because other counties did not spend all funding that was available to them) and the application was approved by FSA. The county is extremely proactive in its approach to conservation. The emphasis in Ripley County was on conservation practices such as gully erosion and sediment control into the streams. According to the District Conservationist, the county never received enough funding to serve the conservation needs for all of the farmers. With the additional funding, more conservation practices were constructed and more farmers were served.

Missouri
A resource specialist in Chariton County in Missouri was contacted and he provided insight into the environmental situation which led to most of the counties in the state receiving additional ACP payments for 1995 and 1996. All counties in question experienced exceptional water damages and flooding due to heavy rainfall in 1995. Chariton and Osage counties are close to the Missouri Rivers which flowed over its banks in the heavy rainstorms in 1995. Additionally, one third of Iowa's side of the river drained into the counties. Flood damage was extensive and the Corps of Engineers had to rebuilt the damaged conservation structures, such as terraces and ponds, to secure the structures back to their pre-storm conditions. DeKalb County is an adjoining county and had similar drainage problems from the flooding. Saline County is mostly hill land and has extensive terracing in place in its highly productive agricultural land. Flooding destroyed a large part of the terrace structures. Stoddard County, on the other hand, is bottom land and the excessive water drained down from the adjoining hills into the area and damaged soils and existing conservation structures. Webster and Wright counties are mostly timber and grassland

with extensive dairy production. The counties had a special project funded through ACP which constructed animal waste lagoons in dairy feedlots. The problem was that the flooding drained into the Lake of the Ozark contaminating it with animal waste runoff.

The resource conservationist at the NRCS office in Dallas County, Missouri, had no explanation as to why his county may have received more ACP funds in both 1995 and 1996. In fact, he stated that in his opinion, his county was always lagging behind all other counties in the state. On the other hand, the resource specialist in Knox County (which received more ACP funding in 1995), explained that the higher allocations also appeared in previous years (for which we do not have the county allocations) because of an intense promotion of Long Term Agreements (LTA) under ACP. Heavy participation in the LTAs was the result and primarily terraces were put in place. Additionally, the county was occupied with servicing CRP which also has a high participation rate among farmers.

The conservationist in Howell County could not explain why Howell County received more cost-share funds under EQIP. To the contrary, although only the northwest corner of the county is considered a priority area, the county received more EQIP allocations than it ever received under ACP. Examining the data does not confirm this, however. The McDonald County conservation specialist, on the other hand, did give us an explanation why his county received more EQIP than the remaining counties. McDonald County merged with Newton County and is located in a priority area. Additionally, livestock is a primary agricultural production in that county, resulting in costly animal waste storage facilities.

Michigan
Lenawee County received more ACP allocations for 1995, however, no explanation was given. Additionally, Lenawee County was allocated considerably more funds under EQIP 1997. The resource conservation expert gave us three reasons. First, the county is in two conservation priority areas; the River Raisin and the Maumee River watershed. The county raises large numbers of livestock which is part of the EQIP funding and was not addressed under ACP. Additionally, the county has highly erodible land. Furthermore, six drinking water sources are located at the River Raisin and the county has a considerable problem with sediment delivery from the farms.

Sanilac County is essentially a dairy county. It received proportionally more ACP funding in 1996 because farmers entered their animal waste facilities into LTAs placing conservation practices on their land. Huron County, on the other hand, had (and has) a higher demand for funding, not only in 1996 as the ACP payment allocation shows. According to the resource specialist, Huron County has historically been the dumping ground for excess ACP funding which other counties did not spend. The state FSA office would ask the NRCS county office if more funds would be needed (when they were available) and Huron County would never refuse because the demand for more conservation practices was always present.

Minnesota
Olmstead County in Minnesota received more EQIP funding for 1997 than funding through ACP. The likely reason for this is that Olmstead County is located in two priority areas; the White Water River Watershed and the Sombro River. The county applied for the Watershed Special Project and was granted more funding. The NRCS office promoted EQIP heavily specifically because the county has a lot of manure problems which were not addressed through ACP. Additionally, due to the publicity for EQIP, farmer interest was high. Rice County was granted proportionally more EQIP funding for 1997 due to large animal facilities. The county is planning numerous manure storage facilities.

Fillmore County in Minnesota is located in the priority area M which is in the Mississippi Watershed. Although Fillmore County is the only county in the state which has no lake, it does, however, have problems with ground and surface water stemming from livestock operations. Winona County is also in a priority area, due to its dairy production and the resulting ground and surface water contamination. Additionally, the ACP allocations were limited to $3,500 per farm per year for conservation practices, while EQIP has a limit of $50,000 per year in cost-share funds and more conservation contracts can be entered for a single farm (as long as they are not for the same tract of land), while under ACP only one practice at a time could be addressed. Winona County has many farms with multiple problems.

Wisconsin

Brown County in Wisconsin received considerably more ACP payments in 1995 than virtually any other county in the state. The resource specialist we contacted explained that the USDA initiated a water quality demonstration project in previous years (the department did the same for seven or eight other counties in the country). Funds were targeted to the watershed in the county addressing nutrient management, among other issues. The project was terminated at the end of 1995. In Monroe County, the reason more ACP funds were allocated in 1995 was because the county committed approximately 50 to 60 LTAs for long term conservation practices. Rock County received proportionately more EQIP funds because is located within a priority area.

Priority Areas for the Midwest

Table 8 shows all of the priority areas for EQIP 1997. These may change for 1998, however, one can see where the counties are located within the watersheds.

Embarras River Watershed	St. Joseph & Tippecano	Southern Iowa	St. Joseph River Basin	South Eastern Karst	Mark Twain	West C stock P
South West Animal Waste Project Area	Kankakee	North Central Iowa	Crockery Creek Watershed	Central Transition - Ia	South Grand	Western gum Ri shed
Illinois Upper Mississippi Animal Waste Management	Maumee	Northern Iowa	Saginaw Bay Area	Central Transition - Ib	SAC	
Cache River Watershed	Middle Wabash	Northeast Iowa	Huron & River Raisin Watersheds	Central Minnesota River	Upper Grand	
Middle Illinois River Resource Rich Area	Eel South	Iowa Great Lakes	Ionia/Montcalm AMP	Northwest Minnesota Transition	Lower Grand	
Mackinaw River Watershed	White Waters	Northwest Iowa	Kent/Ottawa AMP	Oak Savannah Till Prairies	Bootheel	
Fox River Watershed	Lower White - Patoka & Karst	Western Iowa	Eastern Thumb AMP	Minnesota River - North	James	
Southeast Illinois Oil Brine Damage Area	Wabash & Ohio Bluffs	Southeast Iowa	Upper Kalamazoo AMP	Minnesota River - Meadwaters -South	Gasconade	
Southwest Illinois Karst Area	Blue River Karst		Little Rabbitt River AMP	Pine Moraines/Outwash Plains	Cuivre	
Lower Kaskaskia River Watershed	Muscatatuck		Maumee River Watershed	Anoka Sand Plains	One Hundred & Two	
			Capital Area			
			Grand Traverse Bay Specialty Crop Area			
			Karst West Coast Specialty Crop Area			
			Bays de Noc Area			
			Michigan Native American			

One More Econometric Model

Once we established that the environmental indicators do not explain the variation in the Midwest extremely well, we decided to see if the same variables explain funding allocations in the country as a whole. Therefore, a regression model was conducted using the same variables on ACP 1995 and 1996 and EQIP 1997 for each county in the United States.[15]

ACP 1995

Table 9 summarizes the results for the model for ACP allocations for 1995 for all 3,070 counties:

Table 9
ACP95 Regressed on Environmental Indicators and Number of Farms

Variable	ß	Standard Error ß	t	Significant t
STREAM	186.96	26.04	7.18	0
TAYWIND	66.51	155.46	0.43	0.67
TAYWTR	-646.34	91.39	-7.07	0
WEROSION	1.36	0.13	10.76	0
WIEROSIO	-0.03	0.03	-0.93	0.35
FARMS	-1.1	0.58	-1.89	0.058
CONSTANT	31254.41	1468.76	21.28	0
F = 31.58	**Significant F = 0.00**	**R^2 = 0.06**	**Adjusted R^2 = 0.06**	

It is apparent that this model in general is valid, however, the R^2 is so low that it explains virtually nothing in the variation of the dependent variable. Six percent is too low to give the model much credibility, even though some of the environmental indicators are highly significant. For example, looking at the variable for the miles of streams in the counties indicates that for every 100 miles of stream, the county would receive an additional $186.96. On the other hand, the variable for water erosion (WEROSION), indicates that the county received $1.36 in additional ACP funding for one more acre of erosion. This result is questionable at best. Even more questionable is the estimation for average tons of water erosion per acre per year. The estimate indicates ACP funding was taken back for every ton of erosion stemming from water.

[15] A few data gaps need to be mentioned. Texas and South Dakota only provided ACP county allocations for 1996 and EQIP allocations for 1997, while West Virginia could not provide the ACP County allocations for 1996. Additionally, the LTA ACP 1995 allocations for California are missing for the following counties: Sacramento, San Benito, San Bernadino, San Diego, San Joaquin, San Luis Opispo, San Mateo, Santa Barbara, Santa Clara, Santa Cruz, Shasta, Sierra, Siskiyou, Solano, Sonoma, Stanislaus, Sutter, Tehama, Trinity, Tulare, Tuolumme, Ventura, Yolo and Yuba. Environmental Indicators are not available for Alaska and Hawaii. It is also worth mentioning that Nevada made EQIP payments to Mono County and ACP payments to Alpine and Inyo counties in California.

ACP 1996

The regression for ACP allocations in 1996 is similar. Table 10 summarizes the findings:

Table 10

ACP95 Regressed on Environmental Indicators and Number of Farms

Variable	ß	Standard Error ß	t	Significant t
STREAM	182.30	22.00	8.29	0
TAYWIND	-35.11	123.39	-0.29	0.78
TAYWTR	-444.40	90.58	-4.90	0
WEROSION	0.98	0.10	9.63	0
WIEROSIO	-0.01	0.03	-0.31	0.76
FARMS	2.10	0.50	4.17	0
CONSTANT	22053.96	1254.50	17.58	0
F = 37.99	**Significant F = 0.00**	**R^2 = 0.07**	**Adjusted R^2 = 0.07**	

The results are virtually the same as the results for ACP in 1995, with the exception that now the number of farms are highly significant. Looking closer at the estimate for that variable, it indicates, that for every one additional farm in the county, ACP allocations were raised by $2.10. This is not only highly unlikely, it is nonsensical. The model is significant, as the F-value suggests, however, the explanatory power is lacking, with an R^2 of 7 percent.

EQIP 1997

The regression of EQIP 1997 allocation for the entire country on the environmental indicators explains just as little in the variation as the previous models for ACP 1995 and 1996 for the entire country. Table 11 summarizes the results:

Table 11

EQIP 1997 Regressed on Environmental Indicators and Number of Farms

Variable	ß	Standard Error ß	t	Significant t
STREAM	344.45	45.09	7.64	0
TAYWIND	508.47	253.66	2.01	0.045
TAYWTR	-978.55	160.60	-6.09	0
WEROSION	2.07	0.21	10.0	0
WIEROSIO	0.13	0.05	2.58	0.01
FARMS	1.28	1.04	1.24	0.22
CONSTANT	28261.71	2546.28	11.10	0
F = 41.06	**Significant F = 0.00**	**R^2 = 0.08**	**Adjusted R^2 = 0.07**	

The results for EQIP allocations do not differ considerably from the previous models. The model itself is highly significant, as the F-value indicates, however, the model only explains 7 percent in the variation of the independent variable. The number of farms is not significant, nor is wind erosion. The average tons per acre per year of water erosion has a negative impact while the estimate for average acres of water erosion is meaningless. It can be concluded, that other factors somewhere in the country distort the model.

Production Regions

Regional differences could explain why the variation in the dependent variables are so low when performing the regression for all counties in the United States. We looked at the change in ACP allocations for

1995 (omitting 1996 as it was an interim year for ACP) and EQIP allocations for 1997. Table 12 will shed some light as to the shifts in resources between the two years:[16]

Table 12
Changes in Regional Allocations for ACP 1995 and EQIP 1997

Appalachian Region		**Northern Plains**		**Delta Region**	
EQIP	$14,819,420	**EQIP**	$15,484,539	**EQIP**	$13,987,875
ACP 1995	$12,156,286	**ACP 1995**	$10,417,137	**ACP 1995**	$9,896,137
Change	21.91%	**Change**	48.64%	**Change**	41.35%
Pacific Region		**Southern Plains**		**Southeastern Region**	
EQIP	$11,561,578	**EQIP**	$4,246,242	**EQIP**	$11,999,815
ACP 1995	$9,987,410	**ACP 1995**	$2,639,159	**ACP 1995**	$14,226,132
Change	15.76%	**Change**	60.89%	**Change**	-15.65%
Mountain Region		**Midwest**		**Northeastern Region**	
EQIP	$27,192,176	**EQIP**	$34,180,223	**EQIP**	$14,887,500
ACP 1995	$14,242,338($18,742,338)	**ACP 1995**	$31,792,327	**ACP 1995**	$13,785,892
Change	90.92% (45%)	**Change**	7.51%	**Change**	7.99%

There are wide differences in the resource shifts between the regional allocations for ACP 1995 and for EQIP 1997. The regions will be analyzed separately to determine where exactly the resource shifts are and whether there is any evidence that the differences in resource allocations reflect greater attention to need (i.e.; whether we can see any correlation between the cost-share allocations and the environmental indicators). First, we will test the relationship between the allocation of EQIP for 1997 and ACP 1995. Since the data on a regional basis is bimodal, the distribution has two modes and an ordinary least squares regression model is not appropriate for analysis.[17] To test the relationship between the two variables, the Spearman Correlation Coefficient was used.[18] The Spearman's Correlation Coefficient ranges from +1 to -1. Minus one represents a perfectly negative relationship, while plus one is a perfectly positive relationship between two variables. This procedure was performed on the two years of conservation programs as well as on the conservation programs and the environmental indicators. Furthermore, we will examine which states have done relatively better than others. This is especially important in the regions which

[16] Appalachian Region: Kentucky, North Carolina, Tennessee, Virginia, and West Virginia; The Northern Plains Region: Kansas, Nebraska, North and South Dakota; The Delta: Arkansas, Louisiana and Mississippi; The Pacific: Alaska, California, Hawaii, Oregon and Washington; The Southern Plains: Oklahoma and Texas; The Southeast: Alabama, Florida, Georgia and South Carolina; The Mountain Region: Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah and Wyoming; The Midwest: the states discussed above, i.e. the Great Lake States and the Corn Belt; and the Northeastern Region: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island and Vermont.

[17] Since there are counties that receive no allocations in either program, we added one in order to be able to take the natural logarithm of the variable. The natural log of one is zero. Thus, the distribution appears to have a proportion of the data points around zero, while the remaining data points are distributed normally.

[18] The Spearman Correlation Coefficient requires less stringent assumptions about the distribution of the data (i.e.; the data does not have to be distributed normally). It is a test which shows the non-linear relationship between two variables that are arranged in rank order, that is, that are measured on an ordinal scale (i.e.; the ranking procedure takes the data points and ranks them regardless of the distance between the two data points). In other words, for all the cases, the values of each variables are ranked from smallest to largest, the actual distance between the data points is ignored. For example, the values one, three, nine and 10 or the values one, two, 70 and 100 are assigned the same ranks and only the order of observations matter, the distance between them does not (SPSS Base Systems User's Guide).

demonstrate a sharp increase or decease between ACP 1995 and EQIP 1997. The Northeastern Region will not be further analyzed since the shift in funding was only between 7 percent and 8 percent. Furthermore, the analysis for the Mountain Region and the Southern and Northern Plains Regions can be found in Appendix 3, since the county allocations for the Colorado River Basin Salinity Control Program and the Great Plains Conservation Program is not yet available.

The Appalachian Region

The Appalachian Region of the United States should not be constrained by data limitation in terms of other conservation programs which were consolidated into EQIP in the 1996 Farm Bill. The states in this production region should display a reasonable correlation using the Spearman's test for correlating two years of conservation programs. However, it does not. The correlation is only 0.23, however, there is a moderate correlation in the increase in ACP allocation and the increase in EQIP allocations. Table 13 summarizes the percentage differences between the allocations:

Table 13
Percentage Change by State for the Appalachian Region

State	Percent Change
Kentucky	44.00
North Carolina	53.74
Tennessee	-4.36
Virginia	81.50
West Virginia	29.06

Quite obvious is the loss of funds between ACP 1995 and EQIP 1997 for Tennessee, which lost 4.36 percent in overall payment allocations. The largest “winner” was clearly Virginia, with a total gain of 81.5 percent from two years previous. Since this region should be “free” from any misleading additional funds due other conservation programs which would have been consolidated, this result is a bit puzzling, given the 5 percent floor and 30 percent ceiling the government imposed for EQIP allocation from one year to the next. The Water Quality Incentive Program should not make any difference in the correlation and percentage difference of the programs since it was administered as part of ACP and the allocations should be included in the overall ACP county payments.[19] County shifts will be examined in North Carolina and Virginia. Although Tennessee lost about 4 percent, it is still a reasonable percentage according to the floor of 5 percent imposed by the USDA.

North Carolina

In North Carolina, 3 percent of the counties are receiving EQIP allocations where they received none under ACP 1995. Additionally, 46 percent of the counties received above 10 percent more EQIP allocations than they did under ACP. However, 33 percent lost more than 10 percent of their ACP allocations from 1995 to 1997. In 5 percent of the counties, the gains range from five times to almost 10 times more funding under EQIP.

[19] Direct incentive payments of up to $25 per acre, technical/engineering support, and education were available to assist in implementing water quality management systems. An additional $1,500 per applicant, per contract, was also available in cost-share assistance. The Agricultural Conservation Program's annual payment limitation of $3,500 per person, per fiscal year, for up to five years, applies. All producers within designated Water Quality Incentives Project areas were eligible. Project areas are selected nationally.

Virginia
Over 50 percent of the counties in Virginia lost all cost-share funding through EQIP where before they received at least some ACP money. The losses range from a small amount of $74 to about $28,000 under ACP. Additionally, 25 percent of the counties lost more than 10 percent of their initial allocation for 1995, while 20 percent gained more than 10 percent. In some of the counties the gains are considerable. Although most of the counties received between twice as much money, there are six counties (or 6.3 percent) that received between seven times and 25 times more funding through EQIP for 1997.

Delta Region
The Delta Region consists of Arkansas, Louisiana and Mississippi and the differences in payment allocations should also only be slightly misleading due to the Water Quality Incentive Program. The Spearman's test reveals that the ranked payment allocation, though in the right direction, only correlate by 0.29, which is still a moderate positive correlation. Table 14 summarizes the shifts in state allocations from 1995 to 1997.

Table 14
Percentage Change by State for the Delta Region

State	Percent Change
Arkansas	47.62
Louisiana	62.43
Mississippi	19.40

Taking a further look at the states reveals that in Arkansas and Louisiana the increase in funds is substantial at more than 62 percent and 47 percent, while the increase in spending increased a moderate 19 percent in Mississippi from 1995 ACP to 1997 EQIP. County shifts will be examined for Arkansas and Louisiana, omitting Mississippi since the 19 percent gain is quite reasonable.

Arkansas
The distribution of funds in the counties in Arkansas is not as drastic as in some of the states previously examined. In 12 percent of the counties the allocation went to zero for EQIP 1997, with a range of loss between approximately $3,500 and $50,000. Thirty-six percent of the counties lost more than 10 percent of their ACP 1995 allocations, while the remaining counties (50 percent), with the exception of two, received more than a 10 percent increase in funds for 1997. In fact, the addition of funding through EQIP ranges from about 20 percent to 100 percent.

Louisiana
Approximately 11 percent of the counties (or parishes) in Louisiana lost all funding from ACP 1995 to EQIP 1997. The losses range from a low of $350 to over $88,000 in cost-share money. Fifty-one percent of the counties lost more than 10 percent of their previous payments, while 31 percent gained more than 10 percent from the previous allocations. The extent of the increase is extensive in at least one county, which gained more than 68 times the allocation from 1995 to 1997. The remaining counties averaged about four times more funding under EQIP 1997.

The Southeastern Region
The Southeastern Region has an extremely low Spearman's correlation coefficient. The direction proceeds in the right direction but the correlation between ACP 1995 and EQIP 1997 is only 0.17. But at least the two variables, when ranked, proceed in the same direction. There is certainly a need to see

where the shifts occurred. We already know that the region overall lost almost 16 percent from ACP allocations in 1995 to EQIP county allocations in 1997. Table 15 summarizes the results:

Table 15
Percentage Change by State for the Southeastern Region

State	Percent Change
Alabama	-78.73
Florida	48.89
Georgia	1.76
South Carolina	145.00

The allocation for EQIP clearly did not adhere to the limitations imposed by the USDA. Especially since the distribution within the region varies to a large extent, it may be interesting to look at all the counties in these states.

Alabama
In Alabama, over 13 percent of the counties lost all funding under EQIP 1997. The losses range from over $65,000 to more than $150,000 in allocation, which they received through ACP in 1995. Almost 80 percent of the counties lost more than 10 percent of their previous funding level, ranging from 10 percent to over 98 percent. Only 4.5 percent, or three counties received a more than 10 percent increase in EQIP funds over ACP funds.

Florida
Fifteen percent of the counties in Florida received no EQIP allocations in 1997 even though they received some cost-share payments under ACP, ranging from $2,600 to over $37,000. Forty percent lost more than 10 percent from their previous allocations in 1995, with a magnitude loss from 10 percent to about 96 percent, and an average loss of 62 percent between all counties. Three percent (or two counties) actually increased their allocation from zero dollars in 1995 to at least some allocation under EQIP. Thirty-four percent gained more than 10 percent between the two years of cost-share allocations and the extent of increase is rather large. The biggest winner in Florida is Okaloosa County receiving about 21 times more EQIP funding than it did ACP funding in 1995. The average increase was 4.5 times the allocation from ACP 1995 to EQIP 1995.

Georgia
In Georgia, not much change should have occurred within the state (i.e.; the percentage change of county allocation between ACP in 1995 and EQIP in 1997 was minute). However, 22 percent of the counties lost 100 percent of their allocations. The funding for farmer lost in the counties ranges from $400 to over $45,000. Additionally 36 percent of the counties lost more than 10 percent of their previous cost-share allocations, averaging a reduction of almost 60 percent. Thirty-two percent of the counties experienced an increase of over 10 percent between the two years of allocation. These 32 percent received approximately double the allocation from ACP to EQIP.

South Carolina
South Carolina received an incredible 145 percent more funding between ACP in 1995 and EQIP 1997. South Carolina does not have a county that had a reduction of EQIP funding of 100 percent (i.e.; all counties were allocated some EQIP funding). However, 28 percent of the counties lost some funding under EQIP, ranging from 14 percent to 76 percent. The average reduction in funding was 38 percent. Fifty-four percent increased their share by more than 10 percent. The overall additional funding was over 290 percent from 1995 to 1997 payments, or 3.6 fold.

The Pacific Region
The Pacific Region experienced an increase in funding of a reasonable 15 percent. The Spearman test reveals that the ranked order of the two years of cost-share program has a correlation coefficient of 0.54 and it is in the right direction. This region probably needs no further county shift examination due to its fairly high correlation.

The Midwest
Although the Midwest is technically not a defined production region, we have combined the two regions of the Great Lake States and the Corn Belt due to our previous econometric analysis. Additionally, the assumption can be made that these states are not considerably different in their production patterns. Thus, we tested the Spearman correlation on all states, which shows that the two years of programs are only correlated by 0.18, which is not even a modest relation, however the correlation is positive. Further investigation into the state differences in allocation and county shifts are therefore necessary. Table 16 summarizes the results by state:

Table 16
Percentage Change by State for the Midwest

State	Percent Increase
Illinois	157.4
Indiana	-34.3
Iowa	38.4
Michigan	41.2
Minnesota	204.9
Missouri	-38.9
Ohio	-3.4
Wisconsin	-22.4

The shift in the distribution of funds between ACP 1995 and EQIP 1997 are quite fascinating and certainly do not adhere to the floor and ceiling imposed by the USDA, with the exception of Ohio, which only lost 3.4 percent in cost-share money between the two years. Clearly, examining the shifts within the states will be interesting, however, Iowa and Michigan will be omitted from the examination of county shifts due to relatively moderate increases in spending.

Illinois
Illinois is a clear winner in the distribution of funds this year, gaining 157 percent from the allocation in 1995. Approximately 20 percent received no EQIP payments from the previous ACP funding, a decrease of 100 percent. Overall, 48 percent of all counties lost more than 10 percent of their previous funding and more than 50 percent of the counties gained more than 10 percent. The increase in EQIP funding is astounding, as some counties receive between 10 and 33 times more money than they did under ACP 1995.

Indiana
Indiana lost about 35 percent of its cost-share money from 1995 to 1997. This reduction in payments is clearly beyond the 5 percent floor set by USDA. Further investigation into the county shift reveals that 30 percent of the counties lost all funding, while overall 71 percent lost more than 10 percent of their payments. Twenty-six percent gained more than 10 percent, ranging from an increase of double the

amount to approximately 6 times more funding under EQIP than under the 1995 ACP allocation, however, only one county experienced such an increase.

Minnesota
Only one county in Minnesota lost 100 percent of its cost-share payments, while 34 percent lost over 10 percent of their allocations between 1995 and 1997. Approximately 50 percent of the counties received more funding through EQIP than they did under ACP in 1995. In fact, the increase is astounding in some counties. Nine percent of the counties receive 10 to 16 times more EQIP funding than they did ACP 1995 allocations, while 2.3 percent (or two counties) receive about 27 time more money, one county receives 88 times more funding and one county receives 444 times the allocation under EQIP than under ACP 1995.

Missouri
Twenty-eight percent of the counties in Missouri lost 100 percent of their funding from 1995 to 1997, while overall about 82 percent lost more than 10 percent of their previous funding level. Only 13 percent gained more than 10 percent but the gains were relatively modest, ranging from 1.2 times the previous amount to 4.5 times, with the exception of one county which increased its funding level by 26 times the previous level.

Wisconsin
Approximately 17 percent of Wisconsin's counties lost 100 percent of their cost-share funding under EQIP. The overall reduction of more than 10 percent within all counties in Wisconsin is 65 percent, while about 28 percent gained more than 10 percent from their previous cost-share funding. The increases are relatively modest; 8 percent receive twice as much money while only one county receives 18 times the 1995 allocations.

Correlation Between Percentage Allocation Received and the Indicators of "Need"[20]
The research question now becomes whether we see a correlation between the percentage of money received by all counties in the production regions and some measure of need. The county allocations for both EQIP and ACP 1995 were divided by the total allocation for the regions to calculate the percentage of county allocation received (EQCHGE, ACPCHGE). The Spearman's Correlation Coefficient was used to see how well the allocations of cost-share funds correlates to the measures of need. The measures of environmental indicators are the same ones used before from the NRI data base, including acres of erosion by water for 1992 by county (WEROSION), acres of erosion by wind for 1992 by county (WIEROSIO), average tons per acre per year of water erosion in 1992 by county (TAYWTR), average tons per acre per year of wind erosion in 1992 by county (TAYWIND) and 1992 acres (in hundreds) of streams less than 1/8 mile wide (STREAM) as well as the number of farms in each county (FARMS). Then, all states will be tested separately to see where the correlation is better/worse.

[20]Special thanks goes to Dr. Esseks for his invaluable suggestions regarding the following analysis.

The Mountain Region
Table 17 summarizes the results from the Spearman's correlation. The numbers in parenthesis show whether the test was significant (i.e.; zero or close to zero shows that the correlation is significant).

Table 17
Spearman Correlation Coefficients for the Mountain Region

	ACPCHGE	EQCHGE
EQCHGE	0.42(0.00)	
FARMS	0.42(0.00)	0.37(0.00)
STREAM	-0.07(0.23)	0.13(0.03)
TAYWIND	0.31(0.00)	0.28(0.00)
TAYWTR	-0.06(0.31)	0.04(0.49)
WEROSION	0.20(0.00)	0.37(0.00)
WIEROSIO	0.32(0.00)	0.40(0.00)

It becomes quite apparent, that the miles of stream and the average tons of water erosion are not significant when the ranking is performed and the correlation coefficient is calculated, however, the miles of stream becomes a bit more significant under EQIP, which is an encouraging result. EQIP also seems to be more correlated with acres of water erosion and acres of wind erosion, while the number of farms in the regions is less correlated with EQIP. This is also a good indicator, since the funding should not depend on the number of farms, but rather on the agro-environmental problems.

The Northern Plains
In the Northern Plains, the ACP 1995 county allocations for South Dakota is not available, thus, for ACP only 251 counties were ranked and the correlation coefficient was calculated. Table 18 shows the results:

Table 18
Spearman Correlation Coefficients for the Northern Plains

	ACPCHGE	EQCHGE
EQCHGE	0.29(0.00)	
FARMS	0.33(0.00)	0.06(0.31)
STREAM	0.26(0.00)	0.17(0.00)
TAYWIND	0.11(0.09)	0.11(0.05)
TAYWTR	0.16(0.01)	0.01(0.80)
WEROSION	0.40(0.00)	0.22(0.00)
WIEROSIO	0.01(0.93)	0.05(0.34)

In this test, fewer environmental indicators are significant, with the exception of the miles of streams and water erosion for both programs. Again, the number of farms is also not significant for EQIP 1997 but it is significant for ACP, which is what we expected. However, it appears that with the ranking process through the Spearman's coefficient, ACP seems to be more correlated with the remaining environmental indicators. The result for acres of water erosion is definitely better correlated with ACP than with EQIP. These results are surprising, as we assumed that ACP did not respond to the needs in the counties as well as EQIP should. However, neither program responds very well to the environmental problems in the region. It should be noted that the results would likely change somewhat if we had included the Great Plains Conservation Program.

The Southern Plains

For the Southern Plains, only Oklahoma can be examined as well as Texas EQIP allocation. Not only is Texas ACP 1995 missing, but we do not have the allocation for the Great Plains Conservation Program, which should again change the results of the Spearman Correlation Coefficient test. Nevertheless, we performed the test, keeping the constraints in mind (i.e.; for ACP only 77 cases or counties were tested). Table 19 demonstrates the results for Oklahoma ACP and EQIP and Texas EQIP:

Table 19
Spearman Correlation Coefficients for the Southern Plains

	ACPCHGE	**EQCHGE**
EQCHGE	0.55(0.00)	
FARMS	0.25(0.03)	0.39(0.00)
STREAM	0.10(0.39)	0.18(0.00)
TAYWIND	0.46(0.00)	-0.07(0.21)
TAYWTR	0.30(0.01)	0.28(0.00)
WEROSION	0.62(0.00)	0.31(0.00)
WIEROSIO	0.47(0.00)	-0.02(0.76)

Obviously, there are some interesting results to be found with the Spearman's correlation when the observations are ranked. When adding Texas to the equation, the number of farms and the miles of stream are significant (in Oklahoma they are not). On the other hand, with Texas in the analysis, both variables for wind erosion have become insignificant. That result appears to indicate that EQIP does not correlate well with the environmental needs in the region, but no inferences can be made ACP 1995 should be included in the test. Possibly the results will be a bit more similar for both states.

The Appalachian Region

The Appalachian Region does not have any other program to include and has data for all counties in all states in the region. The Spearman's test should reveal useful results and should therefore lead to valid results. Table 20 summarizes the test values:

Table 20
Spearman Correlation Coefficient for the Appalachian Region

	ACPCHGE	EQCHGE
EQCHGE	0.51(0.00)	
FARMS	0.49(0.00)	0.39(0.00)
STREAM	0.30(0.00)	0.17(0.00)
TAYWIND	-0.06(0.17)	-0.15(0.00)
TAYWTR	0.14(0.00)	0.12(0.01)
WEROSION	0.43(0.00)	0.36(0.00)
WIEROSIO	-0.06(0.18)	-0.15(0.00)

For the Appalachian Region, the results are quite interesting. For ACP 1995, all but both variables for wind erosion are significant, while these variables are significant for EQIP. However the direction is opposite as we expected, indicating that as wind erosion increases, EQIP allocations decreases and the Spearman's rho is quite low at -0.15 for both indicators. However, all other variables are significant and it seems that ACP responded to the indicators of environmental need better than EQIP. This again is surprising, given the design of EQIP and its supposed targeting to agro-environmental problems.

The Delta Region
The Delta Region either has no wind erosion or the NRI data base did not report on wind erosion in the states/counties in this region. Thus, the Spearman's coefficient did not report the results for wind erosion. However, all others are intact and are summarized below in Table 21:

Table 21
Spearman Correlation Coefficient for the Delta Region

	ACPCHGE	EQCHGE
EQCHGE	0.35(0.00)	
FARMS	0.60(0.00)	0.37(0.00)
STREAM	0.20(0.00)	0.04(0.58)
TAYWTR	0.11(0.11)	0.05(0.44)
WEROSION	0.38(0.00)	0.24(0.00)

ACP seems to correlate better with the environmental indicators, in this case with the miles of streams, although the coefficient is relatively low, and acres of water erosion. The miles of streams are not significant for EQIP allocation decisions for this year. Water erosion does proceed in the right direction, however the coefficient is quite low. As in the previous regions, this outcome is surprising.

The Pacific Region
The Pacific region's ACP or EQIP allocations are not easily explained given the environmental indicators. This region should also be clear from any extraneous conservation programs but the Spearman's test still explains too little as to what is happening in the region, as Table 22 reveals:

Table 22
Spearman Correlation Coefficient for the Pacific Region

	ACPCHGE	**EQCHGE**
EQCHGE	0.50(0.00)	
FARMS	0.39(0.00)	0.39(0.00)
STREAM	0.46(0.00)	0.34(0.00)
TAYWIND	0.19(0.03)	0.13(0.14)
TAYWTR	-0.15(0.09)	-0.07(0.44)
WEROSION	0.18(0.04)	0.23(0.01)
WIEROSIO	0.20(0.02)	0.14(0.12)

Similar results can be observed in the Pacific region as ACP 1995 responded better to environmental needs than EQIP 1997 did. The exception is the number of farms–the coefficient is modest and proceeds in the right direction for both programs. All other variables, although significant, do not explain well the direction of the allocations. However, the miles of stream both show reasonable results, with ACP explaining the direction slightly better.

The Northeast Region

The Northeast Region's test of correlation between environmental need and the allocation of ACP and EQIP does not show any more encouraging results than the previous. Table 23 summarizes the results:

Table 23
Spearman Correlation Coefficient for the Northeast Region

	ACPCHGE	**EQCHGE**
EQCHGE	0.67(0.00)	
FARMS	0.35(0.00)	0.37(0.00)
STREAM	0.37(0.00)	0.27(0.00)
TAYWIND	0.17(0.01)	0.07(0.31)
TAYWTR	-0.07(0.26)	0.05(0.37)
WEROSION	0.10(0.13)	0.19(0.00)
WIEROSIO	0.17(0.01)	0.07(0.29)

Although the variable acres of water erosion is significant for EQIP, the value is too small to be even considered reasonably correlated. Under ACP, acres of water erosion is not significant. For the miles of streams in the region, the value is modestly correlated to ACP and EQIP, however, the ACP allocations proceed more in the same direction than EQIP allocations. The only need, which is better correlated with EQIP, is the number of farms.

The Midwest

The last region to be examined and tested using Spearman's rho in the Midwest (Corn Belt and Great Lake States). It seemed to have worked well under the Ordinary least Squares Regression analysis and should do just as well when ranked under the Spearman's rho coefficient. However, when using the percentage county allocation, the correlation between the variables is not so much better than the other regions. Table 24 shows the results:

Table 24
Spearman Correlation Coefficient for the Midwest

	ACPCHGE	EQCHGE
EQCHGE	0.38(0.00)	
FARMS	0.31(0.00)	0.28(0.00)
STREAM	0.09(0.02)	0.03(0.39)
TAYWIND	-0.03(0.43)	-0.01(0.86)
TAYWTR	0.18(0.00)	0.18(0.00)
WEROSION	0.32(0.00)	0.28(0.00)
WIEROSIO	-0.02(0.56)	0.01(0.70)

The significant variables are the same as the ones used in the regression analysis, however, once again, ACP seems to take care of environmental problems better than EQIP for all indicators of agro-environmental need. The variables acres of water erosion and the number of farms have a modest positive correlation for both ACP and EQIP, with ACP doing slightly better than EQIP in predicting the direction of the ranked variables. In the next section, we will be looking at the same environmental indicators examining the Spearman's rho state-by-state to see where the environmental need is better met through EQIP.

Correlation of States' Percentage of Funds Received and Environmental Need
Since the analysis of production regions did not turn up strong with environmental needs, our next option is to look at the individual states. Each county's allocations of EQIP and ACP 1995 funds were converted into percentages of the total allocation for the state for both years of analysis. The Spearman Correlation Coefficient was used to see to what extent the states respond to environmental need and the number of farms. The variables for average tons of wind erosion and average tons of water erosion were omitted because they were insignificant in almost all of the econometric analyses. To facilitate the ease with which to interpret the Spearman's rho coefficient, the states in each production region are presented in table format (Tables 25 to 42). Again, the numbers in parentheses represent the significance of the correlation.

The Mountain Region

Table 25
Spearman Correlation Coefficient for the Mountain Region Relating ACP 1995

	AZ ACP	CO ACP	ID ACP	MT ACP	NV ACP	NM ACP	UT ACP	WY ACP
EQCHGE	0.42 (0.12)	0.68 (0.00)	0.27 (0.08)	0.49 (0.00)	0.72 (0.00)	0.26 (0.14)	0.29 (0.13)	0.20 (0.36)
FARMS	0.65 (0.01)	0.73 (0.00)	0.69 (0.00)	0.34 (0.02)	0.57 (0.02)	0.46 (0.01)	0.46 (0.01)	0.25 (0.25)
STREAM	-0.04 (0.89)	0.20 (0.00)	-0.32 (0.04)	0.26 (0.09)	0.58 (0.02)	0.26 (0.14)	0.20 (0.30)	0.23 (0.30)
WEROSION	0.31 (0.27)	0.71 (0.00)	0.40 (0.01)	0.60 (0.00)	0.28 (0.30)	-0.07 (0.68)	0.26 (0.17)	-0.05 (0.84)
WIROSIO	0.23 (0.41)	0.74 (0.00)	0.57 (0.00)	0.53 (0.00)	0.70 (0.00)	0.38 (0.03)	0.19 (0.32)	-0.26 (0.24)

As the table reveals, we did not find very many significant correlation coefficients for ACP in 1995. Colorado appears to have performed the best in distributing the ACP funding where the needs occurred. All variables were significant with the highest correlation with acres of wind and water erosion. A modest correlation can be found with the miles of stream and an excellent correlation with the number of farms. Wind and water erosion was also moderately correlated with ACP 1995 in Idaho, while only wind erosion had an excellent correlation with ACP in Nevada. No significant environmental need variables could be found in Arizona, Utah and Wyoming. EQIP and ACP 1995 had a good correlation in Colorado, Montana and Nevada, implying that the EQIP fund allocations followed closely those for ACP in 1995.

Table 26
Spearman Correlation Coefficient for the Mountain Region Relating EQIP 1997

	AZ EQIP	CO EQIP	ID EQIP	MT EQIP	NV EQIP	NM EQIP	UT EQIP	WY EQIP
FARMS	0.73 (0.00)	0.61 (0.00)	0.35 (0.02)	0.16 (0.31)	0.70 (0.01)	0.35 (0.04)	0.27 (0.17)	0.42 (0.04)
STREAM	0.38 (0.16)	0.22 (0.08)	-0.02 (0.88)	-0.01 (0.95)	0.80 (0.00)	0.23 (0.20)	0.31 (0.11)	-0.23 (0.30)
WEROSION	0.36 (0.19)	0.68 (0.00)	0.05 (0.76)	0.42 (0.01)	0.69 (0.00)	0.14 (0.44)	0.19 (0.33)	-0.03 (0.89)
WIROSIO	0.38 (0.16)	0.59 (0.00)	0.38 (0.01)	0.33 (0.03)	0.54 (0.03)	0.10 (0.56)	0.46 (0.01)	0.19 (0.39)

Colorado appears to perform as well under EQIP as under ACP 1995, although the rho values are slightly lower, indicating that the variables are less correlated under EQIP than under ACP. Miles of streams lost significance. Nevada seems to perform better under EQIP in taking care of the environmental needs in the state. Compared to the Spearman rho coefficient for ACP and environmental need, EQIP is better correlated with the miles of streams and acres of water erosion. Additionally, the number of farms is also positively correlated with the allocation of EQIP funds. EQIP 1997 allocations perform quite a bit worse with the environmental indicators for New Mexico. Although under ACP none of the variables were significant, the EQIP significance level declined considerably. In Utah, none of the environmental variables are correlated with EQIP and the significance level is just as unrelated as under ACP. Also in Wyoming, the environmental needs are not met by either ACP or EQIP.

The Northern Plains Region

In the Northern Plains (as well as in the Southern Plains), one has to be cautious in the interpretation of the results, since we do not have the county allocations for the Great Plains Conservation Program. Additionally, for South Dakota, only the county allocations for EQIP 1997 are available at this time.

Table 27
Spearman Correlation Coefficient for the Northern Plains Relating ACP 1995

	KS ACP	NE ACP	ND ACP
EQCHGE	0.07 (0.87)	0.39 (0.00)	0.31 (0.02)
FARMS	0.36 (0.00)	0.36 (0.00)	0.28 (0.05)
STREAM	0.14 (0.15)	0.32 (0.00)	0.27 (0.50)
WEROSION	0.54 (0.00)	0.19 (0.07)	0.53 (0.00)
WIEROSIO	-0.08 (0.43)	-0.17 (0.11)	0.09 (0.55)

Nebraska's ACP allocations correlated best with the environmental indicators, except wind erosion. Wind erosion was not significant for all three states, while water erosion was significant for Kansas and North Dakota. ACP 1995 and EQIP were modestly correlated in Nebraska, not significant in Kansas and only slightly significant in North Dakota.

Table 28
Spearman Correlation Coefficient for the Northern Plains Relating EQIP 1997

	KS EQIP	NE EQIP	SD EQIP	ND EQIP
FARMS	0.12 (0.24)	0.00 (0.99)	0.05 (0.67)	-0.01 (0.95)
STREAM	0.03 (0.76)	0.09 (0.37)	0.28 (0.03)	0.26 (0.06)
WEROSION	0.11 (0.26)	0.14 (0.19)	0.41 (0.00)	0.23 (0.09)
WIEROSIO	-0.03 (0.80)	-0.05 (0.61)	0.23 (0.06)	-0.12 (0.40)

For Kansas, Nebraska and North Dakota, none of the variables are significant, and, in fact, ACP 1995 performed somewhat better in the correlation. The marked exception is South Dakota, which shows a positive correlation between percent county allocation for EQIP and water erosion. It appears, however, that the Northern Plain States used different categories for their decision to allocate EQIP funds to the counties. Since we have no further information as to their allocation decision, other than the watershed approach, no further explanation can be given.

The Southern Plains
For the Southern Plains, EQIP could be tested for both Oklahoma and Texas, however, since the county allocations for ACP 1995 for Texas are not available at this time, the variable was omitted from the correlation test.

Table 29
Spearman Correlation Coefficient for the Southern Plains Relating ACP 1995

	OK ACP
EQCHGE	0.55 (0.00)
FARMS	0.25 (0.03)
STREAM	0.10 (0.39)
WEROSION	0.62 (0.00)
WIEROSIO	0.47 (0.00)

In the Southern Plains, we know that at least Oklahoma did quite well in taking care of agro-environmental problems as the variables for acres of wind and water erosion are significant and the Spearman's rho coefficient is quite high. Wind erosion is a problem in the plains states and ACP seems to have addressed it reasonably well. ACP and EQIP are also highly correlated which is exactly what should be expected given the process of allocating funds.

Table 30
Spearman Correlation Coefficient for the Southern Plains Relating EQIP 1997

	OK EQIP	**TX EQIP**
FARMS	0.15 (0.18)	0.40 (0.00)
STREAM	0.06 (0.61)	0.10 (0.10)
WEROSION	0.49 (0.00)	0.25 (0.00)
WIEROSIO	0.28 (0.02)	-0.02 (0.75)

Under EQIP, the correlation is not as good as ACP regarding the environmental indicators. Only acres of water erosion is highly significant and shows a reasonable rho value. EQIP allocations for Oklahoma's counties either did not address wind erosion well enough or wind erosion is not a priority for the state. Texas appears to address only water erosion and distributes the funds more according to the number of farms. However, since we have no other data set the results should be viewed with caution.

The Appalachian Region

Table 31
Spearman Correlation Coefficient for Appalachian Region the Relating ACP 1995

	KY ACP	NC ACP	TN ACP	VA ACP	WV ACP
EQCHGE	0.50 (0.00)	0.66 (0.00)	0.50 (0.00)	0.46 (0.00)	0.69 (0.00)
FARMS	0.64 (0.00)	0.71 (0.00)	0.45 (0.00)	0.70 (0.00)	0.87 (0.00)
STREAM	0.22 (0.02)	0.36 (0.00)	0.30 (0.00)	0.49 (0.00)	0.25 (0.07)
WEROSION	0.46 (0.00)	0.54 (0.00)	0.44 (0.00)	0.55 (0.00)	0.03 (0.81)
WIEROSIO	.....	0.03 (0.79)	.....	-0.17 (0.09)	.....

Tennessee's allocations for ACP seem to proceed in the same direction as acres of water erosion, miles of streams and the number of farms. The Spearman's rho coefficients performed quite well (i.e.; the state seemed to have taken the environmental needs into consideration when distributing the funds to each county). The same holds for Virginia, which shows a reasonably high positive correlation with environmental need. Kentucky and Tennessee do not appear to have any wind erosion in the state, or wind erosion was not measured as part of the NRI data base. For North Carolina and Virginia, wind erosion did not seem to be a problem in the allocation of ACP funds in 1995 (i.e.; the rhos are insignificant).

Table 32
Spearman Correlation Coefficient for Appalachian Region the Relating EQIP 1997

	KY EQIP	NC EQIP	TN EQIP	VA EQIP	WV EQIP
FARMS	0.40 (0.00)	0.66 (0.00)	0.35 (0.00)	0.60 (0.00)	0.64 (0.00)
STREAM	0.08 (0.36)	0.40 (0.00)	0.54 (0.00)	0.07 (0.53)	0.10 (0.49)
WEROSION	0.15 (0.10)	0.62 (0.00)	0.60 (0.00)	0.55 (0.00)	0.08 (0.57)
WIEROSIO	.....	0.08 (0.45)	.....	-0.19 (0.07)	.....

In Kentucky, the significance level went down in the correlation test for environmental need. Only the number of farms is still significant, but the Spearman's rho is not as high as under ACP. On the other hand, in North Carolina and Tennessee, the correlation between allocations and environmental need is higher than it was under ACP (i.e.; the states seem to take care of the environmental problems better than before). In Virginia and West Virginia, no marked changes took place between the two years.

The Delta Region

Table 33
Spearman Correlation Coefficient for the Delta Region Relating ACP 1995

	AR ACP	LA ACP	MS ACP
EQCHGE	0.52 (0.00)	0.42 (0.00)	0.13 (0.24)
FARMS	0.52 (0.00)	0.79 (0.00)	0.69 (0.00)
STREAM	0.27 (0.02)	0.05 (0.70)	0.12 (0.30)
WEROSION	0.56 (0.00)	0.50 (0.00)	0.20 (0.07)
WIEROSIO	.....	.....	.....

The Spearman coefficients show a reasonable correlation of ranked ACP percentage allocation to the number of farms for all three states and for EQIP percentage allocations (with the exception if Mississippi). Additionally, none of the states appear to show any wind erosion, which could, again, be because the NRI did not measure wind erosion in these states, or they really do not experience any significant wind erosion. Unfortunately, at this point, there is no satisfying explanation. Only Arkansas and Louisiana seemed to have considered water erosion since the coefficient is significant and relatively high.

Table 34
Spearman Correlation Coefficient for the Delta Region Relating EQIP 1997

	AR EQIP	LA EQIP	MS EQIP
FARMS	0.60 (0.00)	0.38 (0.00)	0.09 (0.41)
STREAM	0.20 (0.09)	0.01 (0.94)	-0.09 (0.41)
WEROSION	0.27 (0.02)	0.18 (0.16)	0.27 (0.01)
WIEROSIO	.....	.....	.....

Quite obviously, in Arkansas and Louisiana EQIP did not perform as well as ACP 1995 as demonstrated by the correlation coefficients. Water erosion has become insignificant in both states. For EQIP, as for ACP, none of the variables are significantly correlated with environmental need or farms.

The Pacific Region

Table 35
Spearman Correlation Coefficient for the Pacific Region Relating ACP 1995

	CA ACP	OR ACP	WA ACP
EQCHGE	0.50 (0.00)	0.60 (0.00)	0.45 (0.00)
FARMS	0.35 (0.01)	0.44 (0.01)	0.59 (0.00)
STREAM	0.61 (0.00)	0.45 (0.01)	0.44 (0.01)
WEROSION	0.14 (0.31)	0.32 (0.06)	0.39 (0.01)
WIEROSIO	0.32 (0.01)	-0.13 (0.45)	0.25 (0.12)

These states do not appear to have taken erosion completely into consideration when allocating cost-share funds. The number of farms and the miles of stream are slightly significant for the states, while water erosion is not at all significant for California (although wind erosion is slightly significant) and Oregon. EQIP and ACP 1995 are strongly correlated in all three states, which is expected, given the restriction for EQIP allocations for this year.

Table 36
Spearman Correlation Coefficient for the Pacific Region Relating EQIP 1997

	CA EQIP	OR EQIP	WA EQIP
FARMS	0.55 (0.00)	0.09 (0.62)	0.50 (0.00)
STREAM	0.52 (0.00)	0.08 (0.63)	0.32 (0.05)
WEROSION	0.43 (0.00)	0.32 (0.05)	0.08 (0.63)
WIEROSIO	0.16 (0.22)	0.03 (0.85)	0.22 (0.19)

California appears to correlate better with water erosion for the percentage of EQIP allocation per county. Additionally, the miles of stream are now more significant and have a reasonable rho value. On the other hand, EQIP is less correlated with environmental needs in Oregon, contrary to the findings for ACP. Now, none of the variables are significant. The same conclusions can be reached for Washington.

The Southeastern Region

Table 37
Spearman Correlation Coefficient for the Southeast Relating ACP 1995

	AL ACP	FL ACP	GA ACP	SC ACP
EQCHGE	0.22 (0.08)	0.46 (0.00)	0.39 (0.00)	0.58 (0.00)
FARMS	0.29 (0.02)	0.37 (0.00)	0.57 (0.00)	0.47 (0.00)
STREAM	0.10 (0.44)	-0.07 (0.60)	0.03 (0.71)	-0.10) (0.55)
WEROSION	0.54 (0.00)	0.59 (0.00)	0.40 (0.00)	0.61 (0.00)
WIEROSIO	.....	0.00 (0.97)	.....	.....

The Southeastern Region also does not seem to experience any wind erosion, with the exception of Florida. In Alabama, the percent county allocation of ACP is only correlated with water erosion and the number of farms is only slightly significant. EQIP percent county allocations and ACP percent county allocations are not significantly correlated, however, the remaining states have a reasonable positive correlation. Miles of streams are not significant in any of the states.

Table 38
Spearman Correlation Coefficient for the Southeast Relating EQIP 1997

	AL ACP	FL ACP	GA ACP	SC ACP
FARMS	0.37 (0.00)	0.55 (0.00)	0.31 (0.00)	0.31 (0.04)
STREAM	-0.14 (0.26)	0.42 (0.00)	-0.09 (0.25)	-0.19 (0.21)
WEROSION	0.23 (0.06)	0.61 (0.00)	0.36 (0.00)	0.76 (0.00)
WIEROSIO	.....	-0.1 (0.42)	.....	.....

The results as to which state does better under ACP or EQIP are mixed in this region. For Alabama, the number of farms has become more significant and the rho coefficient is at a modest 0.37 compared to a non-significant correlation under ACP. EQIP county percentage allocation for Florida is better correlated with the variables, except with wind erosion, which is still insignificant. Georgia and South Carolina EQIP allocations, on the other hand are less correlated with the variables, with the exception of EQIP percent county allocations for South Carolina, which is more highly correlated with water erosion.

The Northeastern Region

Delaware was omitted from the Spearman's Correlation Coefficient test since Delaware only has three counties and a perfect correlation exists between the variables.

Table 39
Spearman Correlation Coefficient for the Northeast Relating ACP 1995

	CT ACP	ME ACP	MD ACP	MA ACP	NH ACP	NJ ACP	NY ACP	PA ACP	RI ACP	VT ACP
EQCHGE	0.20 (0.63)	0.47 (0.07)	0.31 (0.25)	0.58 (0.04)	0.20 (0.58)	0.74 (0.00)	0.62 (0.00)	0.61 (0.00)	0.97 (0.00)	0.62 (0.02)
FARM	0.79 (0.02)	0.54 (0.03)	0.34 (0.20)	0.91 (0.00)	0.37 (0.29)	0.78 (0.00)	0.62 (0.00)	0.66 (0.00)	0.90 (0.04)	0.40 (0.15)
STREAM	-0.33 (0.42)	0.70 (0.00)	0.42 (0.12)	0.53 (0.06)	0.20 (0.58)	0.71 (0.00)	0.42 (0.00)	0.26 (0.04)	0.80 (0.10)	0.17 (0.56)
WEROSION	0.74 (0.04)	-0.05 (0.85)	0.40 (0.13)	0.60 (0.03)	0.18 (0.63)	0.73 (0.00)	0.55 (0.00)	0.45 (0.00)	1.00 (0.00)	0.25 (0.39)
WIEROSIO	..	..	0.10 (0.73)	..	..	0.38 (0.09)	0.00 (0.98)	..	..	..

The Northeast also has mixed results testing the correlation between the county percentage of the total state allocation and the indicators of environmental need as well as farms. Only Maryland, New Jersey and New York actually experience any wind erosion. The miles of streams in the counties were correlated extremely well in Maine and New Jersey. New York and Pennsylvania had a modest positive correlation, while Connecticut, Maryland, Massachusetts, New Hampshire, Rhode Island and Vermont showed insignificant results. Water erosion only had a significant positive correlation in New Jersey, New York, Pennsylvania and Rhode Island (the latter has a perfect positive correlation, however, it only has 10 counties and the test may not be as valid).

Table 40
Spearman Correlation Coefficient for the Northeast Relating EQIP 1997

	CT ACP	ME ACP	MD ACP	MA ACP	NH ACP	NJ ACP	NY ACP	PA ACP	RI ACP	VT ACP
FARM	0.23 (0.59)	0.60 (0.02)	0.13 (0.64)	0.66 (0.01)	0.72 (0.02)	0.67 (0.00)	0.41 (0.00)	0.67 (0.00)	0.87 (0.05)	0.75 (0.00)
STREAM	0.25 (0.55)	0.57 (0.02)	-0.05 (0.85)	0.54 (0.05)	0.02 (0.96)	0.54 (0.01)	0.21 (0.11)	0.20 (0.11)	0.72 (0.17)	0.40 (0.15)
WEROSION	0.25 (0.55)	0.20 (0.46)	0.49 (0.06)	0.79 (0.00)	0.10 (0.78)	0.73 (0.00)	0.43 (0.00)	0.57 (0.00)	0.98 (0.01)	0.63 (0.01)
WIEROSIO	..	..	-0.44 (0.09)	..	..	0.22 (0.34)	0.09 (0.48)	..	..	..

Connecticut, Maine and Maryland are doing worse under EQIP than under ACP, i.e. the percentage allocations for EQIP are correlated worse and even less significant than ACP percentage county allocations. The only change in Massachusetts is that water erosion is now significant and has an extremely high positive correlation with the percentage of EQIP funds per county. New Hampshire is still not significantly correlated with any of the variables, while New Jersey, New York and Rhode Island perform slightly worse under the distribution of EQIP tested with the variables. Pennsylvania displays no significant changes under both tests, while Vermont only changed for the better in terms of the correlation coefficient for the number of farms and water erosion.

The Midwest

Table 41
Spearman Correlation Coefficient for the Midwest Relating EQIP 1997

	IL EQIP	**IN EQIP**	**IA EQIP**	**MI EQIP**	**MN EQIP**	**MO EQIP**	**OH EQIP**	**WI EQIP**
EQCHGE	0.25 (0.01)	0.35 (0.00)	0.83 (0.00)	0.47 (0.00)	0.39 (0.00)	0.25 (0.01)	0.43 (0.00)	0.40 (0.00)
FARM	0.63 (0.00)	0.20 (0.06)	0.15 (0.14)	0.53 (0.00)	0.34 (0.00)	0.39 (0.00)	0.56 (0.00)	0.63 (0.00)
STREAM	0.39 (0.00)	0.10 (0.36)	0.32 (0.00)	0.06 (0.59)	0.14 (0.21)	0.25 (0.01)	-0.18 (0.10)	-0.21 (0.08)
WEROSION	0.71 (0.00)	0.36 (0.00)	0.30 (0.00)	0.50 (0.00)	0.26 (0.02)	0.38 (0.00)	0.51 (0.00)	0.48 (0.00)
WIEROSIO	.....	0.04 (0.73)	-0.26 (0.01)	0.54 (0.00)	-0.20 (0.06)	.....	-0.09 (0.40)	0.01 (0.96)

Quite obviously, and already proven through the regression analysis, ACP did relatively well in targeting environmental problems in the Midwest. What is surprising is that Illinois does not experience any wind erosion. The NRI data base simply must be incorrect, since this state most certainly does encounter wind erosion. As for the other states in the Midwest, only in Michigan does a significant positive correlation exist. Iowa and Minnesota are on the fringe of having a significant correlation, however, both states proceed in the wrong direction, i.e. as wind erosion increased, the ranked order of ACP county percentage allocation decreased. However, it appears that ACP allocations are strongly correlated with water erosion throughout the region. ACP and EQIP also display a reasonable positive correlation in all states.

Table 42
Spearman Correlation Coefficient for the Northeast Relating EQIP 1997

	IL ACP	**IN ACP**	**IA ACP**	**MI ACP**	**MN ACP**	**MO ACP**	**OH ACP**	**WI ACP**
FARM	0.21 (0.03)	0.26 (0.01)	0.14 (0.16)	0.50 (0.00)	0.36 (0.00)	0.46 (0.00)	0.25 (0.02)	0.54 (0.00)
STREAM	-0.10 (0.32)	0.04 (0.72)	0.40 (0.00)	0.10 (0.32)	-0.06 (0.60)	0.10 (0.29)	-0.00 (0.98)	0.00 (0.98)
WEROSION	0.19 (0.05)	0.21 (0.04)	0.42 (0.00)	0.56 (0.00)	0.39 (0.00)	0.08 (0.40)	0.32 (0.00)	0.55 (0.00)
WIEROSIO	.....	0.06 (0.55)	-0.26 (0.01)	0.42 (0.00)	-0.35 (0.00)	.....	-0.25 (0.02)	-0.18 (0.14)

Most of the percentage county allocation for EQIP has become insignificant in the correlation test for environmental need. Illinois water erosion coefficient and the coefficient for the miles of stream in the counties and the number of farms is only slightly insignificant. Indiana and Iowa do not show notable changes in the correlation coefficient while Michigan shows a slightly better correlation for water erosion and a slightly less correlation for wind erosion. Minnesota's correlation coefficient for water erosion has become significant with EQIP allocations, however, wind erosion, though significant shows the opposite sign, i.e. there is a modest negative correlation with wind erosion. Missouri and Wisconsin also do not show remarkable changes in their correlation coefficient, while Ohio shows less emphasis on the number of farms and water erosion.

Conclusion

We conducted several econometric and statistical analyses to determine whether the spending patterns for agro-environmental problems have shifted such that resource allocations reflect the actual problems in the states and counties in the United States. We focused first on the Midwest and the other production regions. Then we conducted correlation tests for the regions and the states within the different regions. Major findings include:

- ACP 1995 and 1996 county allocations decisions are better explained by political boundaries than by environmental indicators.
- Very little of the variance in EQIP county allocations can be explained by either environmental indicators or by political boundaries.
- Changes in funding allocations from ACP 1995 to EQIP 1997 by production region range from a 15 percent decrease to a 90 percent increase.
- Very few state allocations adhered to the 30 percent cap and 5 percent floor from ACP 1995 to EQIP 1997.
- When we examined whether a correlation exists between the percentage of money received under ACP 1995 and EQIP 1997 by all counties in the production regions and some measure of need, we could not find a strong correlation with environmental needs.
- The same correlation test performed on individual states revealed that in most states, ACP 1995 was better correlated with environmental needs than EQIP 1997. This result is surprising and may be a result of a lack of information as indicated below.

Data Limitations and Further Research

From the analysis of the outliers, it becomes clear that the existing data for this study was not adequate to fully explain the county allocations for ACP in 1995 and 1996 and for EQIP allocations in 1997. The environmental indicators used in the regression models and the subsequent econometric analyses were measured in 1992 and changes in the environmental conditions in the Midwest, and in the entire country, for that matter, could have changed since 1992. In fact, it is advisable to collect more data, incorporating conservation practices, such as tilling practices into the regression equation models. Additionally, it would be interesting to conduct a time series analysis for the Agricultural Conservation Program since it has been in effect for many years. However, despite trying to collect the data, we were not able to retrieve the allocations for ACP from any source. Possible research option for the future include:

- Analysis of EQIP and ACP spending distribution based on political variables, such as congressional districts) and agricultural production patterns, especially livestock.
- Incorporation of conservation practices, such a tilling practices, into the analysis.
- Inclusion of water quality issues into the analysis.
- Follow EQIP spending patterns and priority areas over the next few years to see whether targeting to environmental problems improves.
- Use of different econometric and statistical tools for the analysis of resource shifts and the performance of EQIP.

Appendix 1

Animal Units
To calculate the total animal units for a farm, first, the farmer has to determine the number of animals in each species. For each category of animal species, divide the number of animals by the number of animals per 1,000 pounds animal unit in order calculate the animal unit equivalent (as shown in Table 1A). In order to calculate animal unit equivalents for species not shown in the table, multiply the average weight by 1,000 pounds to determine the number of animals per animal unit for each species category. Then divide the number of animals in each category by the number of animals per animal unit. Finally, the total the number of animal units needs to be calculated for each category.

Table 1A
Animal Unit Equivalents per Animal Species

Animal Type	**Approximate Average Weight (lbs)**	**Number of Animal per 1,000 Pound Animal Unit (AU)**
Beef		
Feeder	875	1.1
Calf	250	4
Breeding Stock	1,000	1
Dairy		
Mature Cow	1,400	0.7
Heifer/Heifer Calf	550	1.8
Calf (0-2 months old)	150	6.7
Bull/Bull Calf	875	1.1
Poultry		
Broiler	2.2	455
Layer	4	250
Pullet (less than 3 months old)	2.2	455
Pullet (older than 3 months)	4	250
Turkey on Feed	15	66.7
Turkey Breeding Stock	20	50
Swine		
Nursery Pig	50	20
Growing Pig	110	9.1
Finishing Pig	185	5.4
Gestating Pig	275	3.6
Sow and Litter	375	2.7
Boar	350	2.9

Appendix 2

ACP 1995 Regression Model without Outliers Summary Table

Table 2A
ACP95 Regressed on Environmental Indicators, Number of Farms and States

Variable	ß	Standard Error of ß	t	Significant t
STREAM	-0.36	41.7	-0.009	0.99
TAYWIND	-93.31	616.68	-0.15	0.88
TAYWTR	-1549	924.9	-1.68	0.094
WEROSION	1.73	0.3	5.75	0
WIEROSIO	-0.2	0.19	-1.1	0.29
FARMS	0.86	0.86	1	0.3
IA	-54110.6	4021.9	-13.45	0
IL	-72164.8	6732.1	-10.7	0
IN	-35072.5	3916.2	-8.96	0
MI	-34449.1	4495	-7.66	0
MN	-53309.4	4814.2	-11.1	0
OH	-40006.2	3926	-10.2	0
WI	-23562.8	4224.1	-5.58	0
Constant	68907.4	3583.2	19.2	0
F = 35.9	Significant F = 0	R^2 = 0.4	Adjusted R^2 = 0.38	

ACP 1996 Regression Model without Outliers Summary Table

Table 2B
ACP96 Regressed on Environmental Indicators, Number of Farms and States

Variable	ß	Standard Error of ß	t	Significant t
STREAM	-4.6	43.9	-0.11	0.92
TAYWIND	-1199.8	648.1	-1.9	0.06
TAYWTR	-705.1	973.9	-0.72	0.47
WEROSION	1.6	0.31	5.1	0
WIEROSIO	-0.6	0.2	-0.33	0.75
FARMS	1.98	0.9	2.2	0.028
IA	-44322.5	4249.8	-10.4	0
IL	-67913.8	7089.3	-9.6	0
IN	-61495.3	4121.7	-14.9	0
MI	-34293.9	4759.6	-7.2	0
MN	-28222	5079.6	-5.6	0
OH	-51485.4	4145.5	-12.4	0
WI	-32183.2	4429.3	-7.27	0
Constant	67150.6	3811.3	17.6	0
F = 35.2 Significant F = 0 R^2 = 0.39 Adjusted R^2 = 0.38				

EQIP 1997 Regression Model without Outliers Summary Table

Table 2C
EQIP97 Regressed on Environmental Indicators, Number of Farms and States

Variable	ß	Standard Error of ß	t	Significant t
STREAM	-26.2	77.3	-0.34	0.74
TAYWIND	-2000.3	1145.7	-1.75	0.08
TAYWTR	-4363.6	1706.4	-2.56	0.012
WEROSION	2.72	0.56	4.89	0
WIEROSIO	-0.48	0.35	-1.37	0.2
FARMS	1.69	1.58	1.07	0.28
IA	-2315	7353.2	-0.32	0.75
IL	-15739.5	12425	-1.27	0.21
IN	-2533.7	7156.7	-0.35	0.72
MI	27242.4	8282.1	3.3	0.001
MN	28772.9	9120.3	3.16	0.0017
OH	-25.74	7196.5	-0.004	1
WI	7003.3	7726.1	0.91	0.37
Constant	30257.7	6570.7	4.6	0

F = 5.58 Significant F = 0 R^2 = 0.09 Adjusted R^2 = 0.076

Appendix 3

The Mountain Region
Since the Mountain Region included the Colorado River Basin Salinity Control Program, we nevertheless decided to conduct the tests, however, the results must be interpreted with caution. The extreme increase in EQIP fund allocation in the Mountain Region may be explained by the elimination of Colorado River Basin Salinity Control Program. All States except Idaho participated in the program which was eliminated with the 1996 Farm Bill. EQIP consolidated this program as well as the three other conservation programs for which no county allocation was available. Specifically, the Colorado River basin covered about 244,000 square miles in seven states including west-central Colorado, eastern Utah, northwest-southwest Arizona, southwest Wyoming, southeast Nevada and California, and western New Mexico. Rock formations in the Upper Colorado River Basin, primary marine shales, provide a natural and almost infinite supply of salt that can be leached into the river system. The total amount spent in 1995 was $4.5 million (total ACP plus the Colorado River Basin Salinity Control Program in parenthesis in the table above), which, when added to ACP for the Mountain Region presents a shift of only 45 percent, which is quite reasonable.

The first test was conducted using the non-parametric correlation coefficient on the allocation of EQIP 1997 and ACP 1995 for the Mountain states. The test is significant and the correlation between the two variables is 0.39, demonstrating a moderately high positive relationship between the two variables. In other words, the correlation reveals the low values for EQIP also have low values for ACP 1995. However, we also have to look at the difference in spending from year to year, even though the correlation between the two years is reasonable at 0.39.

Nevertheless, we looked at the individual states to see which states fared better than others and what the increase in spending was over these two years. The Table 3A summarizes the state percentage increases as well as the counties which received proportionally more EQIP payments. One should be cautious interpreting the numbers, since the state allocations for the Colorado River Basin Salinity Program are not yet available:

Table 3A
Percent Change by State for the Mountain Region

State	Percent Increase
Arizona	24.73
Colorado	90.28
Idaho	15.91
Montana	95.00
Nevada	40.60
New Mexico	92.18
Utah	118.96
Wyoming	171.21

The largest increases form ACP 1995 to EQIP 1997 occurred in Colorado, Utah, Wyoming, Montana and New Mexico. All of these states were part of the now eliminated Colorado River Basin Salinity Control Program, which would explain the sharp rise in funding, since this program was funded under a different account and was not part of ACP allocations. Thus, the findings may not reflect the true increase in cost-share payments.

Nevertheless, it would be interesting to examine where the largest increases/decreases occurred on a county basis. We will look at the increase/decrease from 1995 to 1997 for the counties within selected states in the region.

Arizona
The largest increase occurred in Gila County which, under EQIP 1997 receives 85.6 times more funding. The greatest loser in the state is Mohave County which did not receive any EQIP funds this years but received over $115,000 under ACP. Funds under EQIP were also eliminated for Greenlee and Santa Cruz counties. Sixty seven percent of the counties in Arizona gained under EQIP, with the factor increases ranging from one to 85 time what the payments were before in 1995.

Colorado
The shifts in Colorado are a bit more complex. Nineteen percent of the counties received between $44,000 to $3,500 under EQIP and are not allocated any funding under EQIP for this year. The counties are Archuleta, Crowley, El Paso, Fremont, Grand, Hinsdale, Ouray, Park, Rio Grande, Summit and Teller counties. Over seventeen percent of the counties lost more than 10 percent of the funding from ACP in 1995 to EQIP 1997, with the largest percentage drop of more than 90 percent. The largest gain is located in Mesa County which receives now more than 11 times more funding than in 1995. Fifty eight percent of all counties gained under EQIP.

Montana
Montana is a big winner under EQIP, gaining about 95 percent from the previous ACP 1995 allocations. Thirteen percent of the counties dropped from some ACP allocations to no EQIP allocation, with the largest decease in Carbon County which went from approximately $130,000 to zero EQIP payments. Twenty six percent of the counties lost between 17 and 98 percent of the funding under EQIP while the remaining counties all gained more than ten percent.

Utah
Utah was the state with the largest increase from ACP 1995 to EQIP in 1997, gaining 118 percent from 1995 funding. Thirty-eight percent of all counties lost all cost-share payments under EQIP, while two counties lost 65 and 32 percent of their allocation. The remaining counties all gained more than ten percent. The largest increase occurred in Morgan County which received 24 times more under EQIP than it did under ACP 1995.

Wyoming
In Wyoming, only one county lost all funding through EQIP, while one county lost approximately 25 percent of its funding. Eighty seven percent or all of the remaining counties received an increase in funds of more than ten percent. The largest increase in Crook county where the increase is about 300 percent of the allocation from ACP 1995 to EQIP of this year.

The Northern and Southern Plains

The Southern Plains predict the correlation between the ranks of the two years reasonably well at 0.47, i.e. the increase in ACP follows an increase in EQIP as well. However, at this time, only the county allocation in Oklahoma was correlated since Texas ACP funds for 1995 are not available. The correlation is likely to change when Texas is included in the analysis. On the other hand, in the Northern Plains, the Spearman Correlation Coefficient was lower at 0.24. The percent difference was already shown in the Table above for the state of Oklahoma which was about 61 percent increase in EQIP funds over ACP 95. The total amount spent under the Great Plains Conservation Program in 1995 was $15.2 million. When added to that year’s ACP funds, the shift in allocation was actually minus 31 percent. However, state and county level allocation are not yet available and one should be careful interpreting the results regarding the shifts within the regions.

The Northern Plain States did not correlate as well, with a Spearman Correlation Coefficient of only 0.24, although it proceeds in the expected direction. The more EQIP funding there is the more ACP funding was spent. Since the correlation coefficient is relatively low, we need to take a closer look at the shifts within the states in that region. The following table shows which states within the regions experienced a shift in funds between the two years:

Table 3B
Percent Change by State for the Southern Plains

State	Percent Increase
Kansas	30.31
Nebraska	43.32
North Dakota	97.82

The sharp increase in both the Northern Plains and the Southern Plains could also be explained by a terminated program which ACP allocations did not account for, namely the Great Plains Conservation Program. The states which participated in the program were Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas and Wyoming. In other words, all states included in the Northern and Southern Plain States. The program paid up to $35,000 per farm operating unit over a contract period running from 3 to 10 years. New contracts in 1996 covered 1,445,966 acres on 483 operating units. Active contracts exceeded more than 20,815,993 acres. This program was operating in 556 counties in these 10 States. Cost-sharing to participant ranged for specified conservation practices from 80 percent of the cost for practices with the most public benefit to 50 percent for practices where the public benefit was less.

For the Northern Plains, we will only examine the county shifts in North Dakota (South Dakota is missing from the data set and Kansas and Nebraska increased their allocation from ACP 1995 to EQIP by only 30 and 43 percent respectively). This increase is reasonable considering that the allocations for the Great Plains Conservation Program are not available at this time. For the Southern Plains, we will only examine Oklahoma.

North Dakota

North Dakota gained about 98 percent from the county allocations in 1995 to the EQIP allocations in 1997. In 9 percent of the counties, the allocations went from some money to no money within the two years of analysis, while 22 percent of the counties lost more than 10 percent of their previous allocation. However, the increases in the remaining counties are substantial. Sixty-four percent of the counties received an increase of more than 10 percent. In fact, 17 percent received twice as much EQIP than ACP 1995, 8 percent received between three and four times more funding, 15 percent of the counties received between four and six times more payments, and 7.5 percent received between seven and 11 times more EQIP allocations than they did ACP allocations in 1995.

Oklahoma

In Oklahoma, 11 percent of the counties lost all funding under EQIP, while 32.5 percent of the counties lost between 3 percent and 95 percent of the funding under EQIP. However, the increases in the remaining counties are rather large, explaining why the overall increase in Oklahoma was 62 percent. Forty-four percent of the counties gained substantial amounts of EQIP allocations. The increases range between 11 percent and almost 800 percent of the allocation from 1995 to 1997.

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