

**Testimony of Dave White, Chief**  
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**Before the U.S. Senate Committee on Environment and Public Works**  
**Water and Wildlife Subcommittee**  
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Good morning, Chairman Cardin, Ranking Member Sessions, and other members of the Subcommittee. I am pleased that you have given me the opportunity to describe the impressive actions USDA and its customers are voluntarily taking to improve water quality through conservation measures applied on agriculture lands. Our efforts are carried out with the understanding that how landowners manage their lands will help determine the fate of our nation's waters.

Established as the Soil Erosion Service, and later the Soil Conservation Service, our Agency's initial focus was on addressing soil erosion on America's cropland. Through science-based conservation planning and a voluntary incentives approach, great strides have been made in protecting our soil resource base. The conservation technology adopted by American agriculture has prevented disasters like the Dustbowl of the 1930's. As the Natural Resources Conservation Service, our Agency's focus has broadened to look across the landscape managed by our clients. Today, NRCS' conservation planning looks across all land uses and addresses environmental challenges in a more holistic, integrated manner. NRCS' technical assistance model allows our programs and planning services to focus on the environmental concerns of the region or watershed and to meet the objectives of our clients.

It is clear that the loss of nutrients and other pollutants to our waterways is a significant concern in many parts of the Nation. We have made strides toward addressing these concerns as evidenced by information I will give you today.

The NRCS conservation portfolio contains a broad mix of programs aimed at conservation technical assistance, environmental improvement, stewardship, easements, water resources, and snow and soil surveys. Research has shown that the conservation investments, designed by Congress and implemented by USDA, benefit farmers, ranchers and private forest landowners as well as all Americans – by helping secure a high quality environment in concert with food security for our nation and the world.

## Conservation Effects Assessment Project

Over the past several years, NRCS has taken the lead within USDA to estimate the effectiveness of the Department's conservation efforts. The Conservation Effects Assessment Project, or CEAP, is a multi-agency effort to estimate the environmental effects of conservation practices and to develop the science basis for managing the agricultural landscape. In simple terms, CEAP simulates the impacts of conservation on the landscape and provides a path forward on how to improve implementation of USDA conservation programs and policies.

One of the major thrusts of CEAP has been a series of studies on the effects of conservation practices on cropland in reducing the movement of sediment and nutrients from farm fields into rivers and streams. We have released the first three regional reports in this series—on the Upper Mississippi River Basin, the Chesapeake Bay Region, and the Great Lakes Region. We have two more reports coming out on the Ohio-Tennessee River Basin, and the Missouri River Basin. We have plans to complete reports on other major river basins and water resource regions in the conterminous United States.

The CEAP cropland reports are based on farmer surveys on actual farming activities and conservation practices applied. These surveys were conducted by USDA's National Agricultural Statistics Service from 2003 through 2006. We then correlated the survey information with soils and climate information from the National Resources Inventory (NRI) sample points and statistically expanded these data to represent all cropland in the watershed. Finally, we fed the combined information into a natural resource assessment model and then eventually into a watershed model to simulate downstream outcomes of producers' activities. The models simulate environmental conditions allowing USDA to simulate the cumulative effect of conservation practices in terms of—

- **First**, reductions in losses of sediment, nutrients, and pesticides from fields;
- **Second**, enhancement of soil quality through increases in soil organic carbon; and
- **Third**, reductions in delivery of sediment, nutrients, and pesticides to rivers and streams.

The simulations provide estimates of the effects of conservation practices in place on the landscape and also help us determine treatment needs on cropped acres and assess further potential gains from additional conservation treatments.

A follow-up landowner survey will be conducted this coming winter and spring in the Chesapeake Bay Watershed. It will use approximately twice as many NRI sample points as were used in the 2003 to 2006 survey. It will provide statistical reliability of our estimates at a smaller sub watershed scale, and it will also assess the adoption of winter cover crop use on farmland, particularly in Maryland, since 2006.

The CEAP-Cropland assessment includes all conservation practices applied on the land—including those associated with federal conservation programs, supported by the states and non-governmental organizations, and those resulting from the actions of individual landowners and farm operators.

Conservation practices on cropland have been effective. Our CEAP studies show that sediment and nutrient losses from farm fields are lower than they would have been if conservation practices were not in use on those lands. Farmers' adoption of conservation practices has been especially effective in reducing erosion, sedimentation and nutrient movement from fields to waterways.

Agriculture has a disproportionate impact on the loss of sediment, pesticides, and nutrients from farm fields and subsequent loadings of these materials to local waterways. Agriculture is an intensive land use, and these environmental disturbances are a byproduct of the food, feed, fiber, and renewable energy that agricultural lands produce. However, I do not in any way suggest that agriculture cannot and should not do a better job. The water quality improvements we have experienced need to be the foundation for even greater gains in the future, and CEAP is helping us define our effectiveness and identify critical focus areas. Some themes are beginning to emerge from the CEAP-Cropland studies. I will draw upon findings from the first four regions in this series to illustrate what we have discovered in terms of sediment and nutrient loadings. The findings can be summarized as follows:

### **1. Agricultural conservation practices are achieving results.**

Most cropland has structural and/or management practices in place to control erosion. In all four regions, some combination of these practices is in use on 94 percent or more of the cropped acres. Permanent structural practices, such as terraces, are in use in on up to 72 percent of highly erodible cropland acres that would otherwise be vulnerable to high rates of erosion. It should be noted here that the need for structural practices varies widely from region to region: For example, some 44 percent of the cropped acres in the Chesapeake Bay

Watershed are highly erodible land, compared to only 17 percent in the Great Lakes Watershed. In addition to the structural practices, reduced tillage is used in some form on more than 80 percent of the cropland in the regions we have studied so far, and in some regions reduced tillage is used on an even higher percentage of cropland.

Adoption of conservation practices has been especially effective in reducing erosion and sedimentation. In the four regions, computer simulations show that, compared to conditions that we would expect if conservation practices were not in place—

- reductions in field-level sediment losses ranged from 47 to 61 percent,
- reductions in surface losses of nitrogen ranged from 35 to 45 percent,
- reductions in subsurface nitrogen losses ranged from 9 to 31 percent, and
- reductions in total phosphorus losses ranged from 33 to 44 percent.

## **2. Despite the gains, we have opportunities to make more progress.**

The CEAP-Cropland studies have shown us that in most places our focus when working with farmers has to be on nutrient management. In three of the four regions—all but Ohio-Tennessee—the loss of soluble nitrogen in subsurface flows is the single most critical agricultural conservation concern. To some extent, our success in reducing erosion has worked against us because by keeping water on the field we are encouraging increased infiltration of water into the soil. That water carries soluble nutrients into the soil, especially nitrogen, and most of that soluble nitrogen eventually works its way through subsurface pathways into tile drains, ditches, streams, and rivers.

More can be done to reduce nitrogen losses through complete and consistent nutrient management. This means that we need to consider the rate, form, timing, *and* method of application. In some regions, as many as 62 percent of cropped acres need some additional nutrient management to address losses of nitrogen through subsurface pathways. However, with respect to surface losses of nitrogen, acres needing treatment range only as high as 29 percent of the cropped acres. This includes improved management of manure applications, especially the timing of applications, to ensure that the nutrients in the manure are available to the crops when they need them.

### **3. Suites of conservation practices are needed to manage complex loss pathways.**

A system of conservation practices that includes soil erosion control and consistent nutrient management is required to address sedimentation and loss of nitrogen through leaching and associated loss pathways. These systems should include a site specific prescription involving conversion to no-till, installation of field buffers, changes to the crop rotation including the addition of cover crops, and improved nutrient management.

### **4. Targeting the most critical acres delivers the largest benefits.**

A number of factors amplify the potential for nutrients and sediment to move from farm fields, including inherent vulnerability factors such as soils prone to leaching or runoff and high precipitation levels. Targeting those acres with inherent vulnerability factors is likely to deliver the largest benefit. Treating cropped acres with high vulnerability factors can have twice the impact in terms of conservation benefits as treating the acres with low or moderate vulnerability factors. In some areas, the potential conservation benefits of targeting vulnerable acres are even greater.

In the Chesapeake Bay Watershed, significant progress in conservation adoption has been made since the completion of the last phase of the CEAP farmer survey, particularly with respect to cover crop use. Since 2006, implementation of cover crops in the watershed has increased, particularly where state programs have supported the use of cover crops. When used properly, cover crops protect the soil from erosion during the winter months, take up nutrients remaining in the soil, and release plant-available nutrients slowly over the subsequent cropping period, thereby reducing nutrient leaching and runoff during the non-growing season.

Beyond establishing a baseline of conservation programs and highlighting continued areas for improvement for the agricultural sector, CEAP has the potential to be a key tool for improving the effectiveness of our programs. NRCS is using CEAP findings to inform and improve our program implementation process and direct our conservation dollars to benefit water quality as follows:

1. Improved targeting. NRCS has established a number of initiatives that I will highlight later and improved its tools to direct its funding to address lands with the highest priority resource needs. For example we are

- working to incorporate soil vulnerability information into more of our targeting efforts.
2. Suites of practices. The foundation for any suite of practices used to address nutrients will begin with the NRCS Nutrient Management practice standard. NRCS is revising our Nutrient Management practice standard making it more comprehensive and innovative. We are expanding the fertilizer industry's "4R's" mantra – of using the Right Source at the Right Time in the Right Place at the Right Rate by continuing to promote this sound approach with new and innovative technologies like precision agriculture.
  3. Improved treatment of soluble nutrients. We have established a team of experts and are working closely with partner entities to increase the adoption of agriculture drainage water management (these are practices that hold drainage water in the soil over the winter to allow denitrification as well as reduce subsurface losses of nitrogen during the winter) in a focused approach in critical watersheds. The adoption of these conservation practices alone can reduce the outflow of nitrates from subsurface drainage systems by as much as 60 percent.
  4. Monitoring. We developed a new practice standard for edge of field water quality monitoring to assess impacts of conservation practices. This standard was developed in consultation with our partners to ensure our data collection efforts are consistent and meaningful. Additionally, we hired objective science advisors from the academic community to conduct certain monitoring efforts.
  5. Precision agriculture. Precision agriculture or precision farming is a farming management concept that recognizes and responds to variations within a field. It relies on new technologies like use of satellite imagery and sophisticated farming equipment that allows for the application of the right amount of nutrients exactly where they are needed. Farmers can locate their exact position in a field through Global Positioning Systems (GPS) and apply site-specific nutrients avoiding potential over-application in other parts of the field. NRCS has been providing financial incentives across the nation to interested producers through our Environmental Quality Incentives Program (EQIP) for a number of years.
  6. Exploring opportunities. NRCS is exploring innovative approaches to address natural resource needs through potential opportunities for environmental markets.

## **Geographic Initiatives**

The CEAP findings support the manner in which we are implementing our water quality program initiatives in priority geographic areas. I will give you some highlights of our efforts in these areas:

### **MISSISSIPPI RIVER BASIN HEALTHY WATERSHEDS INITIATIVE (MRBI)**

was implemented to improve the health of the Mississippi River Basin. This Initiative builds on the past efforts of producers, NRCS, partners, and other State and Federal agencies. NRCS and its partners are helping producers in selected watersheds voluntarily implement conservation practices and systems that avoid, control, and trap nutrient runoff; improve wildlife habitat; and maintain agricultural productivity. NRCS used Environmental Protection Agency (EPA) and U.S. Geological Survey (USGS) data and CEAP findings as part of the suite of screening tools to identify high priority areas in which to implement MRBI.

MRBI includes a monitoring and evaluation approach designed to assess environmental outcomes at the edge-of-field, in-stream, and at the watershed level. An interagency monitoring strategy is currently being proposed that would enable federal, state and NGO partners to participate in a multidimensional water quality monitoring effort. The data gathered through this effort would help us develop better adaptive management approaches at the field scale and more accurate modeling capabilities at much larger geographic hydrologic unit scales. While there are a number of factors impacting the nutrient loads into the Gulf of Mexico, NRCS conservation efforts with private landowners contribute significantly to reducing nutrient loading in the Mississippi River Basin and ultimately to the Gulf of Mexico.

**CHESAPEAKE BAY WATERSHED INITIATIVE (CBWI)** was authorized through the 2008 Farm Bill. The initiative was authorized to receive \$188 million between FY 2009 and FY 2012. We are working with Federal and State partners to prioritize assistance to cropland where implementation of practices will have the greatest water quality benefits. NRCS used its own data and data from the EPA Chesapeake Bay Program Office, USGS, and the University of Maryland to determine where to direct the CBWI funding. This information was used to locate *agricultural areas with high* nutrient yields to the Chesapeake Bay and nutrient-related local impairments. NRCS will continue to look to sound science, local leadership, and partnerships to help us direct our resources to areas where they can do the most good and produce the largest benefits for water quality.

In addition, we are helping to restore the Chesapeake Bay through the establishment of three “Showcase Watersheds,” – one each in Maryland, Pennsylvania, and Virginia. The concept behind the Showcase Watersheds is to demonstrate what can be accomplished by bringing together dedicated people, sound science and funding to solve natural resource problems in a priority area.

There is a strong demand for CBWI funding for projects in the Chesapeake Bay area. As of September 21, 2011 (FY11), we have developed 1,706 contracts with CBWI funds. Yet, we have more than 560 unfunded applications requesting CBWI funds.

USDA is working with EPA and States on a certainty framework that would encourage farmers to implement a suite of voluntary conservation activities that reduce impacts on water quality. States would develop programs that can provide assurances that the farmers’ activities are consistent with State plans to improve water quality, such as the objectives of a State’s TMDL Watershed Implementation Plan (WIP).

**WEST MAUI CORAL REEF INITIATIVE (WM-CRI)** is designed to control land-based pollution threats to coral reefs in the Ka’anapali-Kahekili watershed of Hawaii. The health of living coral reefs is dependent upon superior water quality and clarity allowing effective sunlight penetration. The primary threats to this watershed include sediment deposition, nutrients, and other pollutants which are transported in surface water runoff and groundwater seepage into coastal waters. NRCS is working with agricultural producers and other non-federal land managers to address soil erosion and soil health, water quality and conservation, air quality, healthy plants, energy conservation, global warming issues, and upland and wetland wildlife habitat enhancement.

The goals of this initiative are: 1) to reduce pollution to improve coastal water quality and coral reef ecosystem health; 2) to improve coordination between federal and state agencies, land managers and marine scientists; 3) to improve knowledge of how land management affects coral reef health; and 4) to increase awareness about water quality, pollution prevention, and control measures.

**GREAT LAKES RESTORATION INITIATIVE (GLRI)** targets the most significant environmental problems in the Great Lakes Basin. These problems include toxic substances and areas of concern, invasive aquatic and terrestrial species, near-shore and non-point source pollution, and habitat and wildlife protection and

restoration. NRCS worked with EPA to identify priority watersheds for nonpoint source pollution reduction.

In FY2011, NRCS received over 600 applications for assistance under GLRI and currently has obligated over 390 contracts totaling over \$18.7 million under the reimbursable agreement with EPA. Most of the contracts focus on reducing nutrient and sediment loads from private lands, combating invasive species, and improving wildlife habitat.

### **CEAP-Wildlife Findings**

While we are on the subject of CEAP, I want to emphasize that CEAP is more than a series of cropland studies. CEAP also has components for analyzing grazing lands, including rangeland and pastureland; wetlands; and wildlife habitat. There are also CEAP studies at the watershed scale to validate broader scale findings.

A number of the CEAP-Wildlife studies have been released, but I would like to emphasize one that was carried out in Montana, where I worked for several years and which Senator Baucus represents. In this study, the response of wild trout to reach-scale stream improvement from 1989 to 2009 was examined primarily on private ranchlands in Montana's Blackfoot River Basin. Population densities were estimated to examine the response of native and non-native trout to conservation practices on 17 streams.

Three years after restoration treatment, total trout density increased 59 percent from pre-treatment conditions. In fact, trout densities approached those of relatively undisturbed reference streams. Improvements in most streams were followed by increasing and sustained trends in total trout density.

Stream restoration efforts have resulted in the expansion of native fish populations, including the west-slope cutthroat trout, across several tributaries and within the main stem of the lower Blackfoot River. This particular trout species is important because it is a candidate for listing under the Endangered Species Act.

Other examples where we are using a landscape level approach to addressing resource concerns include NRCS wildlife initiatives:

## **MIGRATORY BIRD HABITAT INITIATIVE (MBHI)**

The Migratory Bird Habitat Initiative (MBHI) has proven to be very successful in providing critical habitat in a way that also provides significant water quality benefits. In response to the Deepwater Horizon oil spill in the Gulf of Mexico last year, NRCS quickly launched the MBHI to help landowners develop alternative habitats for migrating and wintering waterbirds. NRCS worked with owners and operators of private croplands, catfish ponds and Wetlands Reserve Program easements throughout the Mississippi Alluvial Valley and Gulf Coast regions and NRCS provided assistance developing shallow water and mudflat habitats to make moist soil, plant seeds and tubers, waste grain and invertebrate foods available. In the wake of the oil spill and during the severe drought conditions along the Gulf Coast in 2010, landowner response to the initiative was overwhelming, with over 470,000 acres enrolled. NRCS was able to assist private landowners with providing wetland habitat at a critical time in Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, Missouri, and Texas. The enrolled lands were heavily used by migrating waterfowl and shorebirds. The MBHI also helped mitigate some of the damage caused by the oil spill, as well as combat drought conditions and decades of wetland losses in the area.

NRCS initiated a three-year effort with partners, including Mississippi State University, to determine the initiative's effectiveness through monitoring the number and species of birds which utilize the habitat created.

Preliminary estimates reveal that the enrolled acres provided up to 36 percent of the food energy needs of the over 9 million ducks that winter in this area. MBHI is also very cost-effective. For example, the \$5.2 million MBHI expenditure in southwest Louisiana resulted in a calculated 475.7 million duck-energy days, or about 1 cent per duck-energy day. A duck energy day is the amount of food energy needed to sustain an average sized duck for one day. For comparison, the estimated cost of feeding an average-sized duck a commercial maintenance diet in captivity is about 4 cents per day, which is nearly 4 times greater than the estimated cost of a duck-energy day delivered through MBHI.

MBHI is demonstrating the potential for agricultural lands to remain productive while simultaneously providing needed habitat for wildlife. As a result, NRCS is extending the initiative north to improve migratory bird habitat in nesting areas.

Other examples where we adopted a landscape level approach to addressing wildlife issues in a manner that also provides significant water quality benefits include:

## **NORTHERN PLAINS MIGRATORY BIRD HABITAT INITIATIVE (NP-MBHI)**

NRCS has a longstanding commitment to supporting wildlife in the Prairie Pothole Region and throughout the rest of the US. In 2011, NRCS implemented the Northern Plains Migratory Bird Habitat Initiative (NPMBHI) through its working lands conservation programs. This collaborative effort aims at restoring working lands to wetlands; managing farmed wetlands to minimize impacts on wildlife and water quality; and, maintaining existing wetlands. In addition to providing habitat, improvements to the region's wetlands will reduce the nutrients and sediment in the waters of the initiative area.

The initiative covers approximately 100,000 square miles, including portions of Iowa, Minnesota, Montana, North Dakota, and South Dakota. The region supports more than 50 percent of North America's migratory waterfowl, and over 300 bird species rely on the region during migrations.

## **NEW ENGLAND-NEW YORK FORESTRY INITIATIVE**

The forests of New England and New York cover 52 million acres, including the largest intact block of temperate broadleaf forest in the country. The forests are the backbone of the rural economies providing a sustainable source of renewable energy, forest products, tourism, outdoor recreational opportunities, and clean water.

The New England/ New York Forestry Initiative has allowed seven states (Connecticut, Maine, Massachusetts, New Hampshire, New York, Pennsylvania, Rhode Island, and Vermont) to undertake a regional approach to address forest ecosystem health.

Strategic Watershed Actions Teams (SWAT) funded through the initiative will dramatically increase protection and restoration of forests and provide water quality benefits. For example, in Vermont, it is estimated that the teams will increase forest management plan development and implementation, increase habitat for upland species, and reduce soil erosion by 41,000 tons over the next 3 years, decreasing the sediment and phosphorus reaching Lake Champlain by 29,000 tons and 39,000 pounds, respectively.

## **Summary**

There is a sense among the agricultural community that these are uncertain times for farmers. The public is increasingly interested in knowing the results of

our program expenditures. Our CEAP effort will help us target program funds to the places and the practices that have the greatest impact on nutrient and sediment loadings to waters, as well as addressing other natural resource concerns. With assistance from key partners in critical watersheds, we have developed new approaches, such as Strategic Watershed Action Teams, that we believe will engage additional producers to accelerate conservation adoption on private lands. Through new planning tools, we will integrate the technology developed through CEAP at the farm level to help clients understand the conservation benefits from recommended practices and make science-based decisions. In addition, USDA is actively working with EPA and the states to explore a framework for engaging producers in conservation activities while providing regulatory certainty to producers. With our resources, the resources of our partners, and the resources of producers themselves all leveraged toward improving water quality, USDA sees the agricultural community as taking a proactive approach to addressing water quality issues of this nation.

I appreciate the invitation to be here today and I am happy to answer any questions.