



Downstream... Valuing

Report Says Iowa's Conservation Investments Make a Difference in Water Quality

How have existing on-farm conservation efforts affected Iowa's water quality and what value do they have?

Seven major conservation practices used on Iowa farms are estimated to remove 11 to 38 percent of the total nitrogen, 6 to 28 percent of the nitrate, and 25 to 58 percent of the phosphorus that otherwise would be present in 13 large-scale watersheds that cover most of the state. Those are the findings from a new report prepared by researchers at Iowa State University's Center for Agricultural and Rural Development (CARD). The study estimates that Iowans invest about \$435 million annually in these agricultural conservation practices.

The complete study findings are contained in "Conservation Practices in Iowa: Historical Investments, Water Quality and Gaps," which takes a detailed look at the cumulative costs and environmental benefits of conservation practices on Iowa farms.

The research and analysis were conducted by a team of researchers from CARD, with funding provided by the Leopold Center for Sustainable Agriculture, Iowa Farm Bureau Federation, Iowa Soybean Association, and the Iowa Corn Growers Association.

The study was designed to help provide a benchmark for current conservation practices to help establish viable solutions for future conservation efforts. Specifically, it sought to answer three questions:

- What is the value of major conservation practices currently in place on Iowa farms?
- What are the effects of these practices on water quality?
- What would it take to improve water quality to obtain specific standards?

The estimated \$435 million investment includes average statewide costs of about \$37 million for selected Iowa conservation structures (terraces and grassed waterways), annual payments of about \$175 million to farmers for acres set aside as part of the Conservation Reserve Program, plus contour farming, contour strip cropping, no-till and mulch-till conservation practices in farming operations. The data sets used in the analysis represent conservation practices and their costs in place in 1997, except for conservation tillage, which is based on 2004 coverage and costs.

To answer the second question on the effectiveness of these practices, CARD researchers relied on a widely used water quality model, the Soil and Water Assessment Tool (SWAT). They looked at 13 large-scale watersheds that cover most of Iowa, and modeled the impact of seven major conservation practices on the quality of both surface water and groundwater, measured by the predicted levels of nitrogen and phosphorus in each watershed.

The extent of the practices used, land use and environmental conditions in each watershed affected the predicted outcomes. However, the seven conservation practices were responsible for statewide nitrogen, nitrate and phosphorus reductions. Nitrates loadings in the western Iowa watersheds were reduced by the greatest amount.

To answer the third question, researchers considered three scenarios using the SWAT model: to reduce phosphorus loadings by 40 percent, to reduce nitrate loading by 25 percent, and to reduce both phosphorus and nitrate by 40 percent and 25 percent, respectively.

They looked at a variety of land use options—from land retirement to conservation tillage and fertilizer reduction—and used computational tools known as evolutionary algorithms to search for the lowest costs of reaching targets in each scenario. The options did not include longer or more varied crop rotations, use of buffers or manure in place of fertilizer inputs.

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According to the model outputs, a scenario that would target a 40 percent reduction for phosphorus would simultaneously result in a 31 percent reduction in nitrate loadings. However, the annual estimated cost to implement a variety of conservation practices would be \$613 million statewide. These costs are in addition to funding existing conservation practices.

“This study does not provide a single solution on how to improve Iowa’s water quality,” said Catherine Kling, head of CARD’s Resource and Environmental Policy Division and lead researcher in the study. “Our results indicate that the most cost-effective measures to improve water quality are different across different watersheds, and that targeting different pollutants will mean different land use options. One message for stakeholders is that they must have a good knowledge of their watersheds before adopting policies to bring about change in land use.”

The full report is on the web at www.card.iastate.edu/environment/. ■

Groups Urge President to Sign WRDA

The National Oilseed Processors Association (NOPA), along with several other agriculture-related organizations recently sent US President George W. Bush a letter requesting him to sign into law the Water Resources Development Act of 2007 (WRDA).

WRDA would authorize a 15-year project that includes modernization of seven locks on the Upper Mississippi and Illinois Rivers. Additionally, WRDA includes a balanced, science-based environmental restoration program that recognizes the rivers’ environmental value and potential.

The letter stated that “For continued success, U.S. farmers need efficient transportation networks, which is why we have been long-time advocates for improvements to our inland waterway system. WRDA is crucial to farmers who depend on the inland waterway system to deliver their crops to the global marketplace and to businesses who rely on the system to move their raw materials and products.”

The letter went on to say that the groups feel that Congress

has produced a “meaningful and responsible legislative package” that addresses issues such as environmental restoration, navigation, flood control, hurricane protection, water supply, irrigation and beach nourishment and recreation.

The letter noted that the House of Representatives overwhelmingly passed the WRDA conference report by a vote of 381 to 40 in August. The Senate followed suit by passing the conference report 81 to 12 in early October.

In closing the letter said “It has been many years since a reauthorization of WRDA. Our producers cannot afford to wait any longer. If we fail to move forward, the world will look elsewhere for a reliable supplier of basic food commodities. Therefore, signing WRDA would be a strong signal of your commitment to a world-class waterways infrastructure and the competitiveness of American agriculture. We strongly urge you to sign WRDA into law.”

Other groups signing the letter included: American Farm Bureau Federation; American Soybean Association; Corn Refiners Association; National Association of Wheat Growers; National Corn Growers Association; National Council of Farmer Cooperatives; National Farmers Union; National Grain and Feed Association; Renewable Fuels Association; and The Fertilizer Institute. ■

ADM Honored for Innovative Environmental-Business Solution

GE Water & Process Technologies, a unit of General Electric Company, awarded Archer Daniels Midland Company (ADM), with the 2007 global ecomagination Leadership Award for its innovative environmental and business efforts. More than a decade ago, ADM’s Decatur, Illinois corn plant, which processes corn for food, feed, industrial products, and biofuel, implemented a sustainable water management program—conserving 150 million gallons of water each year and realizing \$1 million USD in annual operational savings.

“Healthy water sources are essential for healthy

communities, industries, and agriculture production,” said Jeff Garwood, president and CEO, GE Water & Process Technologies. “Managing our fresh water sources in a sustainable way is not only critical to the long-term health of our natural resources, but it is also essential to the vitality of the industries located in the industrial and agriculture heartland of the U.S. ADM won the 2007 ecomagination Leadership Award for its environmental leadership. ADM is an excellent example of how small changes can result in big wins for both the environment and business.”

Today it is estimated that industrial water use in developed countries accounts for as much as 59% of all fresh water consumption. At the same time that water consumption continues to rise, groundwater depletion, water contamination, demographic shifts and unpredictable weather conditions continue to impact the world’s fresh water sources.

“At ADM, we know that taking a sustainable business approach doesn’t just benefit our environment and communities, it benefits our company as well,” said Bill Manley, plant manager for ADM’s Decatur corn plant. “Our Decatur site has been reusing wastewater for more than a decade. And this year alone we’ve reused and captured over 150 million gallons of wastewater. Our innovative water conservation and treatment strategy brought a million dollars in operational savings, as well. Using GE’s wastewater system and cooling tower treatment solutions, we minimized our reliance on municipal water sources, conserved fresh water supplies, and improved our operational efficiency.”

Working with GE to develop a sustainable water management program, ADM installed a ZeeWeed wastewater treatment system, an ecomagination-certified membrane ultrafiltration system, to minimize water withdrawn from Lake Decatur, local fresh water wells, and municipal water sources. The ZeeWeed membranes treat wastewater from the site, producing high-quality effluent that can be reused in the site’s cooling towers. ADM also implemented a cooling tower treatment program that included GE specialized chemistry, monitoring services and feed and control equipment. The program enabled ADM to improve its operational efficiency and its reduce environmental footprint.

For more information on the GE ecomagination Leadership Award and ecomagination water and process technologies, please visit www.gewater.com. ■

Fuels vs. Food Debate Focuses on Water

The topic of water availability—often disregarded but of vital importance—has been introduced as a further issue in the ongoing debate over the balance of food/feed and biofuels by the International Water Management Institute (IWMI: Colombo, Sri Lanka). On October 7, IWMI released a report entitled “Study Warns that China and India’s Planned Biofuel Boost could Worsen Water Scarcity, Compete with Food Production” (available at netlink: www.iwmi.cgiar.org).

The report notes that plans by China and India to produce more biofuels could cause shortages of water, which is needed for crops to feed the countries’ growing populations. The concern focuses on the fact that both countries are contemplating corn (maize) and sugar cane, two crops with heavy demands for water, as feedstocks for the production of biofuels.

“Crop production for biofuels in China and India would likely jeopardize sustainable water use and thus affect irrigated production of food crops, including cereals and vegetables, which would then need to be imported in larger quantities,” said Charlotte de Fraiture, the study’s lead author.

China is said to be planning to increase biofuels production fourfold to around 15 billion L (4 billion gallons) of ethanol—9% of its projected gasoline demand—by 2020, from a 2002 level of 3.6 billion L (950 million gallons). India is pursuing a comparably aggressive strategy, intending to double requirements for ethanol-blended gasoline to 10% in the next year. In order to meet these targets, China would need to produce 26% more corn and India 16% more sugar cane, which would require an extra 75 L (20 gallons) of irrigation water per person per day in China and an additional 70 L (18.5 gallons) per day in India, beyond what is needed for food production. A possible solution to the problem could be focusing on alternate crops for biofuel production such as sweet sorghum for ethanol and jatropha bush and pongamia trees for biodiesel.

A study released on October 10 by the National Research Council (Washington, DC) and its Committee on Water Implications of Biofuels Production in the United States warned that increased production of crops for ethanol production could threaten water supplies in the United States. For biorefineries, the water consumed for the production of ethanol—although modest compared with the water used growing biofuel crops—could substantially affect local water supplies. ■

