

# **Understanding Agriculture And Clean Water**

#### **Clean Water Act**

Established in 1972, the Clean Water Act (CWA) created the basic structure for regulating discharges of pollutants into water bodies as well as the regulation of quality standards for surface waters. Under the CWA, the Environmental Protection Agency (EPA) has implemented pollution control programs such as setting wastewater standards for industry. The main outcome of the CWA makes it unlawful to discharge any pollutant from any point source into navigable waters unless permitted by the National Pollution Discharge Elimination System (NPDES).<sup>1</sup>

The CWA enforces specific requirements to many agricultural practices such as:

- Animal Feeding Operations
- Aquaculture Projects
- Applying biosolids on farmland
- Drainage into estuaries
- Draining wetlands

## **Nonpoint and Point Sources**

Nonpoint source (NPS) pollution comes from many sources such as the movement of pollution via rainfall or snowmelt moving over and through the ground. The runoff carries natural and human-made nutrients and



Photo by Ben Curtis

pollutants into Iowa's water bodies. Pollutants include fertilizers, herbicides, bacteria and other nutrients. NPS pollution is managed primarily by the state through encouraging farmers to use the best management practices toward reducing or preventing the movement of toxins into water bodies. Unlike nonpoint source pollution, point source pollution is identifiable by a single, discreet source. Point sources are heavily regulated.

Animal feeding operations and industrial agriculture are significant point sources that produce massive amounts of wastewater. These sources of pollution essentially are not regulated and rely on voluntary measures to prevent pollution.

## The Iowa Nutrient Reduction Strategy (INRS)

One strategy to address pollution from point and nonpoint sources is the Iowa Nutrient Reduction Strategy.<sup>2</sup> Drafted and finalized by Iowa State University in partnership with the Iowa Department of Natural Resources and the Iowa Department of Agriculture, the strategy attempts to assess and reduce nutrients to Iowa waters

<sup>&</sup>lt;sup>1</sup> "Summary of the Clean Water Act", www.epa.gov/laws-regulations/summary-clean-water-act

<sup>&</sup>lt;sup>2</sup> *Iowa Nutrient Reduction Strategy. A Science and Technology-based Framework to Assess and Reduce Nutrients* to Iowa Waters and the Gulf of Mexico. Iowa State University College of Agriculture and Life Sciences, n.d. Web. 31 May 2013, www.nutrientstrategy.iastate.edu/sites/default/files/documents/NRSfull-130529.pdf

and the Gulf of Mexico.<sup>3</sup> The strategy authors outlined what they consider a "pragmatic approach" through targeted practices designed to reduce loads from nonpoint sources such as farm fields. Although the plan is relatively new and in its beginning phases, "it is the first time such an integrated approach involving both point and nonpoint sources has been attempted and will evolve over time as new information and data are discovered. After two years of working on the 200+-page "strategy," it recommends "...targeted voluntary conservation measures, in conjunction with research, development and demonstration of new approaches." Iowa's answer to reducing nutrients in the Mississippi River watershed is to keep doing what we've been doing.

## **Nitrogen and Phosphorous**

The Iowa Nutrient Reduction Strategy focuses on nitrogen and phosphorus as the two primary nutrients that contaminate Iowa's waterways. Nitrogen (Nitrates and Nitrites) and Phosphorous (Orthophosphate) at high concentrations in water can be devastating for river, lake, and ocean ecosystems and interfere with beneficial water uses. Targeting the reduction of these two chemical elements can:

- Improve water clarity and minimize objectionable algal growths affecting water-based recreation;
- Reduce dissolved oxygen deficiencies which can lead to fish kills and reduce aquatic biological diversity; and
- Minimize occurrence of taste and odor chemical compounds that impact potable drinking water supplies.

# **Sediment Sequestration**

Of course, Nitrogen and Phosphorous are essential elements in many life cycles. However, these chemicals can disrupt natural and psychical processes at high concentrations. There are many methods to sequester nutrients and mitigate the flow of toxins into Iowa's waters. The Iowa Nutrient Reduction Strategy suggests the following solutions:

- Cover Crops
- Living Mulches
- Buffers
- Extended Rotation Land Use
- Grazed Pastures



Photo by Ben Curtis

Many of these methods are currently voluntary and without

enforcement by state or federal governments. The strategy leaves it up to the landowner, absentee or local, to adopt methods that will improve the quality of Iowa's water.

## Role of the IDNR

According to the INRS, the "strategy emphasizes implementation of technology-based nutrient reductions in the near-term, with continued assessment and development of suitable nutrient criteria as a long-term goal." In order to achieve both goals, the lowa Department of Natural Resources (IDNR) is the designated agency in establishing and updating lowa's water quality standards. The U.S. EPA, under the authority of the Clean Water Act, also has the authority to promulgate water quality standards to lowa when necessary. EPA either approves or denies DNR's water quality standards so they comply with CWA. The strategy directs the IDNR to work directly with individual facilities and farms in assessing and implementing nutrient reduction strategies.

<sup>&</sup>lt;sup>3</sup> "Iowa Nutrient Reduction Strategy." *Iowa Nutrient Reduction Strategy*. Iowa State University of Science and Technology, n.d. Web. 31 May 2013, www.nutrientstrategy.iastate.edu

## **Glossary of Terms**

**Aquaculture.** The cultivation and harvesting of fish populations under controlled conditions and is also known as aquafarming.

**Biosolids.** Commonly known as "sludge," biosolids consist of municipal treatment plant solids that are suitable to be reused for land application.

**Buffer Strip.** Areas or strips of land maintained in permanent vegetation, designed to intercept pollutants and erosion.

**Cover Crop.** A crop planted to manage soil characteristics such as soil fertility, soil quality, water, weeds, pests, diseases, and the biodiversity of the agro ecosystem.

**Estuaries.** Transition zones between river and sea environments that intake both seawater and freshwater making the habitat very productive.

**Extended Pasture Land Use.** Grazing some pastures earlier or later and longer in duration with the desire to reduce costs and make more efficient use of resources.

Grazed Pastures. Enclosed tracts of farmland that are primarily used for grazing by domesticated livestock.

**Nonpoint source pollution.** NPS pollution comes from a variety of diffuse sources such as land runoff, precipitation, drainage, seepage, or hydrologic modification.

**Living Mulches.** A cover crop that is inter-planted with the main crop with the intention of serving the functions of mulch, such as regulation of soil temperature or weed suppression.

**Runoff.** Agricultural runoff is water flow that occurs when excess water from rain or melt water flows over the land.

**Tillage.** Tilling consists of agricultural processes of industrial agriculture, such as digging, stirring, and overturning.

**Point source pollution.** Characterized by relatively constant discharges from stationary locations or fixed facilities from which discrete discharges originate.