



Delaware Nutrient Management Commission



ANNUAL REPORT

*To Governor Jack A. Markell and
the 147th Delaware General Assembly*

April 1, 2014



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Cover photo: Farm of Connie Carmean, the 2013 Environmental Stewardship Award winner, in Laurel. For more information, see Page 9. Front and back cover photos by Gary Emeigh.

Delaware Nutrient Management Commission

Mission of the Nutrient Management Program:

“To manage those activities involving the generation and application of nutrients in order to help improve and protect the quality of Delaware’s ground and surface waters, sustain and promote a profitable agricultural community, and to help meet or exceed federally mandated water quality standards, in the interest of the overall public welfare.”



Introduction

The Nutrient Management Program has completed its 14th year since the passage of the Nutrient Management Law in 1999. The law was enacted to address agriculture’s influence on water quality in Delaware. The Law requires all farmers, golf courses and other nutrient handlers to develop and implement a phosphorus-limited nutrient management plan, maintain nutrient handling records and maintain nutrient certification. They must also submit an annual report that details nutrient generation and handling information.

Organizational Purpose and Governing Body

The program’s purpose is to;

1. Regulate those activities involving the generation and application of nutrients,
2. Establish a certification program that encourages the implementation of best management practices in the generation, handling or land application of nutrients,
3. Establish a nutrient management planning program and
4. Formulate a systematic and economically viable nutrient management program.

Organizational Structure and Strategic Goals

What is the Delaware Nutrient Management Commission?

The Nutrient Management Law established a 19-member Commission that is charged to develop, review, approve and enforce regulations governing the certification of individuals engaged in the business of land application of nutrients and the development of nutrient management plans. The members of this Commission come from many different backgrounds and professions.

The law established an independent 19-member commission consisting of 15 voting members and 4 ex officio members.

The 15 voting members consist of:

- The Director of the Division of Watershed Stewardship of the Delaware Department of Natural Resources and Environmental Control or his/her designee,
- 4 members appointed by the Governor,
- 3 members appointed by the President Pro Tempore of the Senate,
- 2 members appointed by the Senate Minority Leader,
- 3 members appointed by the Speaker of the House, and
- 2 members appointed by the House Minority Leader.

The 14 appointed members of the Commission shall be

residents of the state, shall have participated in the industry or organization they represent for at least five years, and shall consist of:

- 7 full-time farmers
 - 1 dairy producer
 - 1 swine producer
 - 1 equine operation owner
 - 2 poultry farmers
 - 2 row crop farmers (1 vegetable, 1 grain)
- 1 commercial/agricultural nutrient applicator,
- 1 member of the commercial nursery industry,
- 1 golf course/lawn care industry representative,
- 2 members from one or more community-based environmental advocacy groups,
- 1 nutrient consultant, and
- 1 public citizen.

The ex-officio members include:

- the Secretary of the Department Agriculture,
- the Secretary of the Department of Natural Resources and Environmental Control, and
- the Secretary of the Department of Health and Social Services, or their respective designees, and
- the Nutrient Management Program Administrator.

The members of the commission may be viewed in the back of this booklet.

What are the Commission's Responsibilities?

The Delaware Nutrient Management Commission will:

1. Consider establishing critical areas for voluntary and regulatory programs.
2. Establish Best Management Practices to reduce nutrients in the environment.
3. Develop educational and awareness programs.
4. Consider incentive programs to redistribute excess nutrients.
5. Establish the elements and general direction of the State Nutrient Management Program.
6. Develop nutrient management regulations.



This well maintained production area is characterized by proper manure handling and excellent housekeeping practices.

Strategic Goals:

1. Promote alternative use practices for excess nutrients generated in Delaware by developing and implementing incentive and market-based programs.
2. Maintain a program to assist in developing and funding nutrient management plans according to law and program standards.
3. Maintain nutrient management certification requirements by providing nutrient handlers with initial and continuing educational opportunities.
4. Maintain the State's National Pollutant Discharge Elimination System (NPDES) Permitting program for Concentrated Animal Feeding Operations (CAFOs) on behalf of the Delaware Department of Agriculture (DDA) in cooperation with the Department of Natural Resources and Environmental Control (DNREC) and according to the Federal Clean Water Act.
5. Promote demonstration projects within the agricultural community for best management practices.
6. Audit nutrient management activities to ensure legal compliance.
7. Respond to informal and formal complaints against nutrient management handlers and generators.
8. Recognize environmental stewards within the agricultural community with the cooperation and financial support of the agri-businesses operating within the state.
9. Facilitate and actively fund research projects according to priorities that will better balance science-based policy development with modern and responsible nutrient management practices.

Performance Measure Goals

| | FY2011 Actual | FY2012 Actual | 2013 Actual |
|--|------------------|------------------|----------------|
| Tons of poultry manure relocated within Delaware for land application | 19,549 | 16,964 | 22,817 |
| Tons of poultry manure exported from Delaware for land application | 20,107 | 20,706 | 20,088 |
| Tons of poultry manure relocated to an alternative use project | 19,182 | 14,048 | 18,877 |
| % of cropland and nutrient-applied land managed under a current plan developed by a certified consultant | 100 | 100 | 100 |
| Acres managed under an updated nutrient management plan | 91,922 | 61,481 | 116,048 |
| # of nutrient consultants | 113 | 113 | 113 |
| # of commercial handlers | 75 | 74 | 74 |
| # of private applicators | 1,164 | 1,150 | 1,136 |
| # of nutrient generators | 494 | 495 | 519 |
| # of nutrient management farm audits | 20 | 116 | 73 |
| # of constituent complaints: | | | |
| received | 24 | 29 | 20 |
| resolved | 21 | 29 | 20 |

This Annual Report to the Governor highlights the activities of the Nutrient Management Program.

Nutrient Management Training, Education and Certification

By Dr. Amy Shober and Sydney Riggi
University of Delaware Cooperative Extension

The University of Delaware Cooperative Extension continues to offer initial nutrient management certification training semi-annually to individuals who apply nutrients to ten or more acres of Delaware land or have a commercial livestock operation. These state-wide training sessions are led by University of Delaware Cooperative Extension, with assistance from the Delaware Department of Agriculture. Program oversight is provided by the Delaware Nutrient Management Commission and the Delaware Department of Agriculture. The certification sessions provide the latest information and tools to encourage the adoption of best management practices to reduce the risk of nutrient loss to water. Since the program's inception in 2001, the University of Delaware Cooperative Extension has provided state-mandated certification training to over 3,100 individuals and certified more than 2,400 individuals at four certification levels (Table 1). In 2013, the University of Delaware Cooperative Extension offered 13 initial certification sessions and six required examination sessions. In 2013, 71 individuals were newly certified (Table 1), representing a variety of business types (Figure 1).

| Certification Level | Number of Individuals Certified | | |
|-----------------------------|---------------------------------|------|-----------|
| | 2011-2012 | 2013 | All Years |
| Nutrient Generator | 734 | 31 | 765 |
| Private Nutrient Handler | 1,484 | 22 | 1,506 |
| Commercial Nutrient Handler | 99 | 8 | 107 |
| Nutrient Consultant | 91 | 10 | 101 |
| All Levels | 2,408 | 71 | 2,479 |

Table 1. Number of individuals certified through the University of Delaware Cooperative Extension Nutrient Management Certification Sessions.

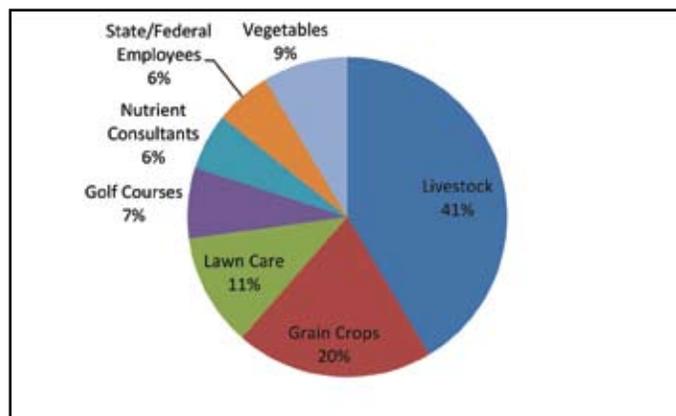


Figure 1. Certifications in 2013 by business type.

Once certified by the Delaware Nutrient Management Program, individuals are required to attend continuing education programs to obtain CEUs as required to maintain certification. Program subject matter is as varied as the individuals who attend the continuing education programs. The main program audiences include lawn, landscape, golf course, athletic field, vegetable, grain, poultry, dairy, and many other industries. As the Delaware Nutrient Management Program matures, an emphasis is placed on offering more advanced continuing education topics. Continuing education programs offer the latest scientific research or technologic advancement to improve water quality. In 2013, certified individuals attended a total of 7,331.25 hours of nutrient management continuing education (Figure 2). The combined attendance of certified individuals at the 120 programs approved for Delaware Nutrient Management Continuing Education Credits in 2013 was 3,099. Providing Delaware Nutrient Management Program Continuing Education Credits is a collaborative effort between the many entities that organize and present programs to clientele (Figure 2). The University of Delaware Cooperative Extension approves and tracks all of the continuing education programs.

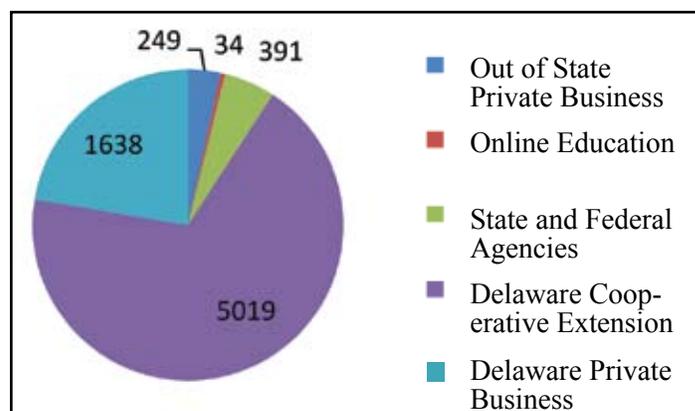


Figure 2. Providers of Continuing Education Credits



Nutrient Management certification sessions for Delaware farmers are conducted by the University of Delaware and Delaware Department of Agriculture.

University of Delaware Extension Poultry Specialist Bill Brown is utilizing social media for the benefit of the poultry industry and the Nutrient Management Program. He has developed the University of Delaware Poultry Extension blog. He has been updating the site regularly and has linked it to the Nutrient Management website. It is too soon to judge the effectiveness of this new avenue for Nutrient Management Program staff to connect with the regulated community.



Visit Bill Brown's blog on poultry at <http://sites.udel.edu/poultryextension/>.

Commissioner Laura Hill Wins Award

Nutrient Management Commissioner Laura Hill of Lewes was honored at Delaware's Ag Industry Dinner with the Secretary's Award for Distinguished Service to Delaware Agriculture. Laura has served on the Nutrient Management Commission since 2009, representing Sussex County poultry farmers. Laura, with her husband, Roland, and their two sons, Roland III and Jerad, also own and operate a 2,500-acre grain and vegetable farm in addition to their poultry farm.

Laura is one of the first women to receive the award, which was presented by Delaware Secretary of Agriculture Ed Kee. Laura was selected for her outstanding service to Delaware Agriculture, involvement with the Delaware Farm Bureau and 4-H Program over the years.

Currently, Laura is serving as the second vice-president of the Delaware Farm Bureau. Laura was the first woman to be elected as an Officer in 2012. She has been a member of the Farm Bureau since 1977. She also serves as chair of the Farm Bureau Food Booth, the Legislative Committees, and on the Farm Bureau Executive Committee. Laura also previously served as the Sussex County Farm Bureau Women's Committee Chair.



Laura Hill, Nutrient Management Commissioner, receives the Secretary's Award for Distinguished Service to Delaware Agriculture from Secretary Ed Kee with U.S. Senators Chris Coons (left) and Tom Carper (right).

Laura's service to the Delaware Nutrient Management Commission is valued, and her dedication to all of these groups shows her commitment to Delaware Agriculture.

Nutrient Handling in Bucks Branch Watershed

The Nutrient Management Program conducted inspections with farmers who till ground within the Bucks Branch watershed during the winter months of 2013. A routine inspection of the farmer's nutrient management plan and fertilizer records were reviewed during these visits.

There are 16 farmers who till ground within this watershed and 14 inspections were successfully completed. The Nutrient Management Program also assessed, on a watershed level basis, the average soil phosphorous levels, application rates of organic fertilizer (manure), recent cropping rotations, and tillage practices. The information gathered from the farmers allowed the Nutrient Management Program to assess nutrient handling activities on a watershed-wide level.

Nutrient Management staff also worked with the University of Delaware and the United States Geological Survey in planning and implementing a research project within the watershed. One goal of this research was to evaluate Delaware's current Phosphorous Site Index for possible improvement. In order for irrigation practices to be credited in the Chesapeake Bay model, research must be conducted and the accompanying data submitted to the Chesapeake

Bay Program for review. This may provide evidence to support crediting specific irrigation and fertigation practices in the Chesapeake Bay model.

The Nutrient Management Program would like to thank all of the farmers within the Bucks Branch watershed for their cooperation with these inspections.



Irrigation helps crops better utilize nutrients.

Nutrient Management Annual Reports

The Nutrient Management Law requires anyone operating under a nutrient management plan or animal waste management plan to submit an annual implementation report for each calendar year detailing all organic and inorganic nutrient handling activities that occurred from January 1st through December 31st. There have been modifications made to the 2013 annual report to collect more detailed information of agricultural operations.

Beginning in 2013, the Nutrient Management Program developed an annual report specifically designed for golf course operations. In the past, golf course operations utilized the existing agricultural annual report. This new annual report was mailed directly to the golf courses under the attention of superintendent.

Approximately 1,451 annual reports were mailed to agricultural, golf course and lawn care operations throughout Delaware. Annual reports were also mailed to farmers who live in neighboring states who till ground and raise livestock and/or poultry on farms located in Delaware. The Nutrient Management Program is very appreciative of the annual report response and is encouraging all operations to complete the form in its entirety to ensure an accurate representation of nutrient handling activities within Delaware. The accuracy of the information provided on these annual reports is vital to ensure all nutrient generators and handlers are following the recommendations outlined in their nutrient management plans to sustain agronomic productivity and environmental responsibility. The data from the annual report is very important because it helps the Nutrient Management Program advocate that Delaware farming operations are leaders in achieving better water quality while ensuring agricultural profitability.

DELAWARE NUTRIENT MANAGEMENT PROGRAM
NUTRIENT MANAGEMENT ANNUAL REPORT - 2013
 The Nutrient Management Annual Report represents nutrient handling information from the previous calendar year, i.e. 2013. THIS REPORT IS DUE NO LATER THAN MARCH 1, 2014. (NOTE: PLEASE COMPLETE ITEMS 1-8, SIGN & DATE)

1. PARTICIPATION INFORMATION:
 Applicant Name: _____
 Mailing Address: _____ State: _____ Zip: _____
 City: _____ Telephone Number: (____) _____
 Farm/Business Name: _____
 Farm/Business Mailing Address: _____ State: _____ Zip: _____
 City: _____

2. MANAGEMENT PLAN TYPE:
 Nutrient Management Plan (NMP - Animals, Crop Production)
 Animal Waste Management Plan (AWMP - No Crop)
 NM Consultant Name: _____ Cert. #: _____
 Start Date of Most Current Plan: _____
 Expiration Date of Most Current Plan: _____
 Total Acres Included in Plan: _____
 Name & Number of NM Certification Holder in the Operation: _____ Cert. #: _____

3. WATERSHED - Geographical Location(s) of Operation(s):
 % in Watershed _____ % in Watershed _____ % in Watershed _____

4. ANIMAL TYPE:
 Poultry Farms Capacity per Flock: _____ Number of Annual Flocks: _____
 Dairy Total Animal Number: _____
 Beef Total Animal Number: _____
 Swine Total Animal Number: _____
 Horse Total Animal Number: _____
 Other: _____ Total Animal Number: _____

5. MANURE EXPORT FOR LAND APPLICATION:
 Manure Type: _____ Amount Exported: _____
 Tons Gals. Name of Receiver(s): _____
 Tons Gals. _____
 Tons Gals. _____

6. MANURE EXPORT FOR ALTERNATIVE USE:
 Manure Type: _____ Amount Exported: _____
 Tons Gals. Name of Receiver(s): _____
 Tons Gals. _____

7. LAND APPLICATION OF MANURE DURING 2013 GROWING SEASON:
 Please indicate the total amount of manure, slurry, or process wastewater land applied during the 2013 growing season & specify the total acres applied (complete all that apply):

8A. SUMMARY OF NUTRIENT APPLICATIONS & CROP YIELD DATA (Geographic/Commercial Fertilizers)

INSTRUCTIONS for completing the table below: (Check/attach additional sheets if necessary)
 The following table reports nutrients applied for grain planted & harvested in 2013 and broadcast in 2013. Report commercial fertilizer nutrients in total pounds applied for the entire crop, 2012, on a per acre basis. Report total pounds of commercial fertilizer in 2012 and 2013 applied during 2013 in the table below. For 2012 with commercial fertilizer in separate columns (1 and 2, total P lbs under the commercial fertilizer heading in the table below. DO NOT REPORT fertilizers applied to FALL-PLANTED 2012 CROPS.)

| CROP | ACRES | TOTAL POUNDS OF N & P (lb) APPLIED FROM: | | | | | | 2013 YIELD AVERAGE |
|--------------|-------|--|---|---|---|--------------------|---|--------------------|
| | | 2012 COMMERCIAL FERTILIZER APPLICATIONS | | 2013 COMMERCIAL FERTILIZER APPLICATIONS | | 2013 YIELD AVERAGE | | |
| | | 1 | 2 | 1 | 2 | 1 | 2 | |
| BALRY | | | | | | | | |
| WHEAT | | | | | | | | |
| RYE | | | | | | | | |
| OTHER: | | | | | | | | |
| TOTALS: | | | | | | | | |
| GRAND TOTAL: | | | | | | | | |

8B. SUMMARY OF NUTRIENT APPLICATIONS & CROP YIELD DATA (Geographic/Commercial Fertilizers)

INSTRUCTIONS for completing the table below: (Check/attach additional sheets if necessary)
 The following table reports nutrients applied for grain planted in 2013 and broadcast in 2013. Report commercial fertilizer nutrients in total pounds applied for the entire crop, 2012, on a per acre basis. For example, 100 acres of corn with 120 lb per acre of nitrogen and 300 lb per acre of phosphorus applied with commercial fertilizers in 2012, would be reported as 12,000 lb N and 3,000 lb P under the commercial fertilizer heading in the table below. DO NOT REPORT fertilizers applied to FALL-PLANTED 2012 CROPS on this table.

| APPLICATION AREA | ACRES | TOTAL POUNDS OF N & P (lb) APPLIED FROM: | | | | | | | | | | | |
|------------------|-------|--|---|---|---|---|---|---|---|--|--|--|--|
| | | 2012 COMMERCIAL FERTILIZER APPLICATIONS | | | | 2013 COMMERCIAL FERTILIZER APPLICATIONS | | | | | | | |
| | | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | | | | |
| FAIRWAYS | | | | | | | | | | | | | |
| GREENS | | | | | | | | | | | | | |
| TIES | | | | | | | | | | | | | |
| OTHER: | | | | | | | | | | | | | |
| TOTALS: | | | | | | | | | | | | | |
| GRAND TOTAL: | | | | | | | | | | | | | |

This report is provided as truthful and accurate to the best of my knowledge.

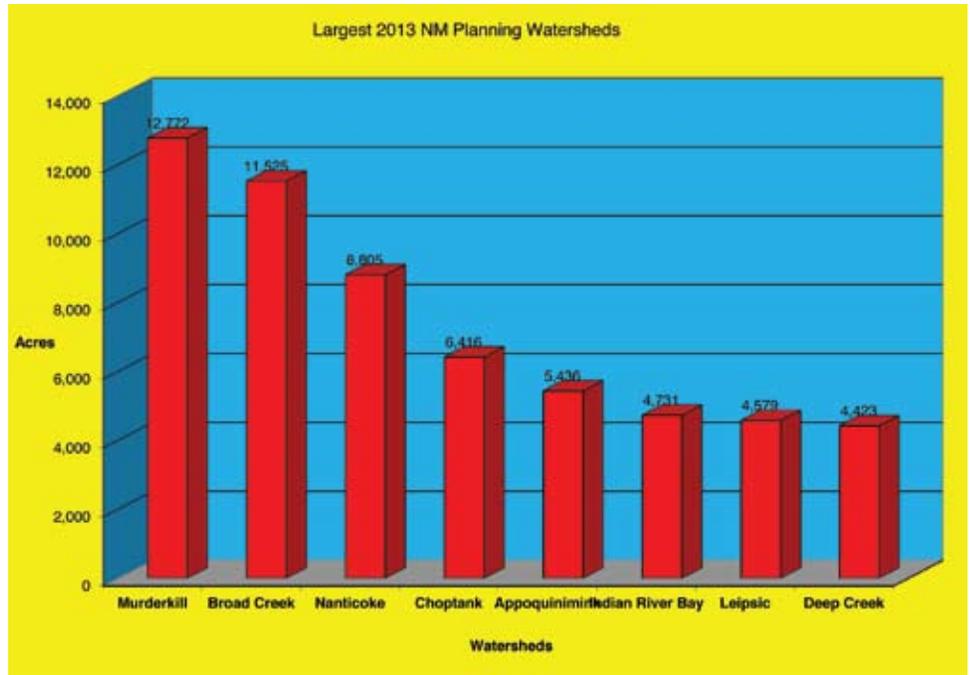
Signature: _____ Date: _____

Nutrient Management Planning

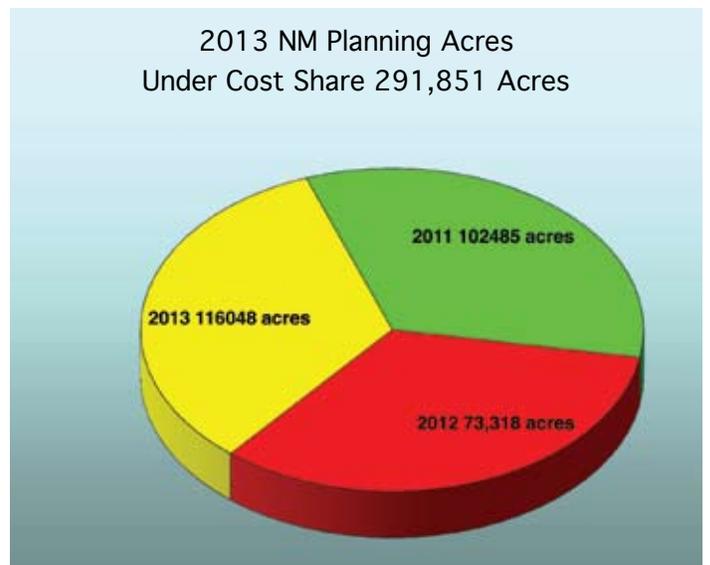
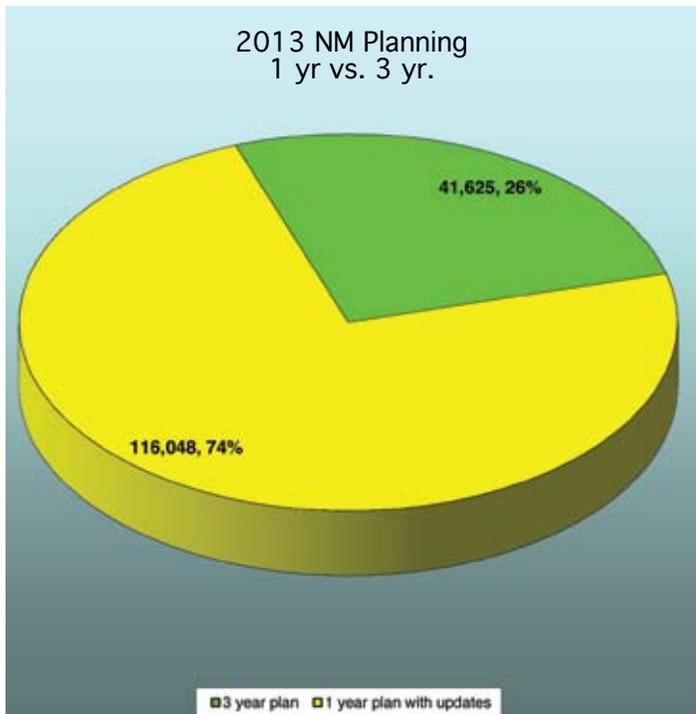
A nutrient management plan is a farmer's "business plan" for nutrients. The more efficiently fertilizers are used on the farm, the less nutrients escape to waterways. A plan is developed by a certified nutrient consultant and includes contents such as maps, soil analysis, manure analysis, crop yield goals and a budget for nutrients.

The Commission depends on private and public nutrient consultants to develop nutrient management plans. In 2013, 153 farms representing 102,915 acres were reimbursed at a capped rate. The Kent and Sussex Conservation Districts assisted Delaware farmers by writing nutrient management plans totaling 6,129 acres. These acres represent an obligation for at least three years of nutrient management planning. Also, 301 farms were assisted with an animal waste management plan or comprehensive nutrient management plan.

During 2013, Delaware farmers applied and were approved for a total of 116,048 acres of nutrient management planning. The total acreage covered by nutrient management planning reimbursement during 2012, including those farms approved during 2011 and 2012, was 291,851 acres.



A Nutrient Management Plan is a farmer's guide to the application of nutrients.



Nutrient Management Plan Audits

Each year program staff performs audits on a number of facilities required to operate with a nutrient management plan, records and certification. This process helps to ensure that plans meet the intent of the nutrient management

law and regulations. During 2013, program staff audited nutrient management plans for eight agricultural operations, 14 golf courses and 65 concentrated animal feeding operations.

Nutrient Management Relocation

Managing excess poultry manure has been a priority of the Commission since inception. Many farmers who do not have cropland or have high soil phosphorous levels must find alternative uses for poultry manure. Several businesses now help such farmers manage their excess manure. The Relocation Program is one of several effective solutions to excess manure generated in Delaware.

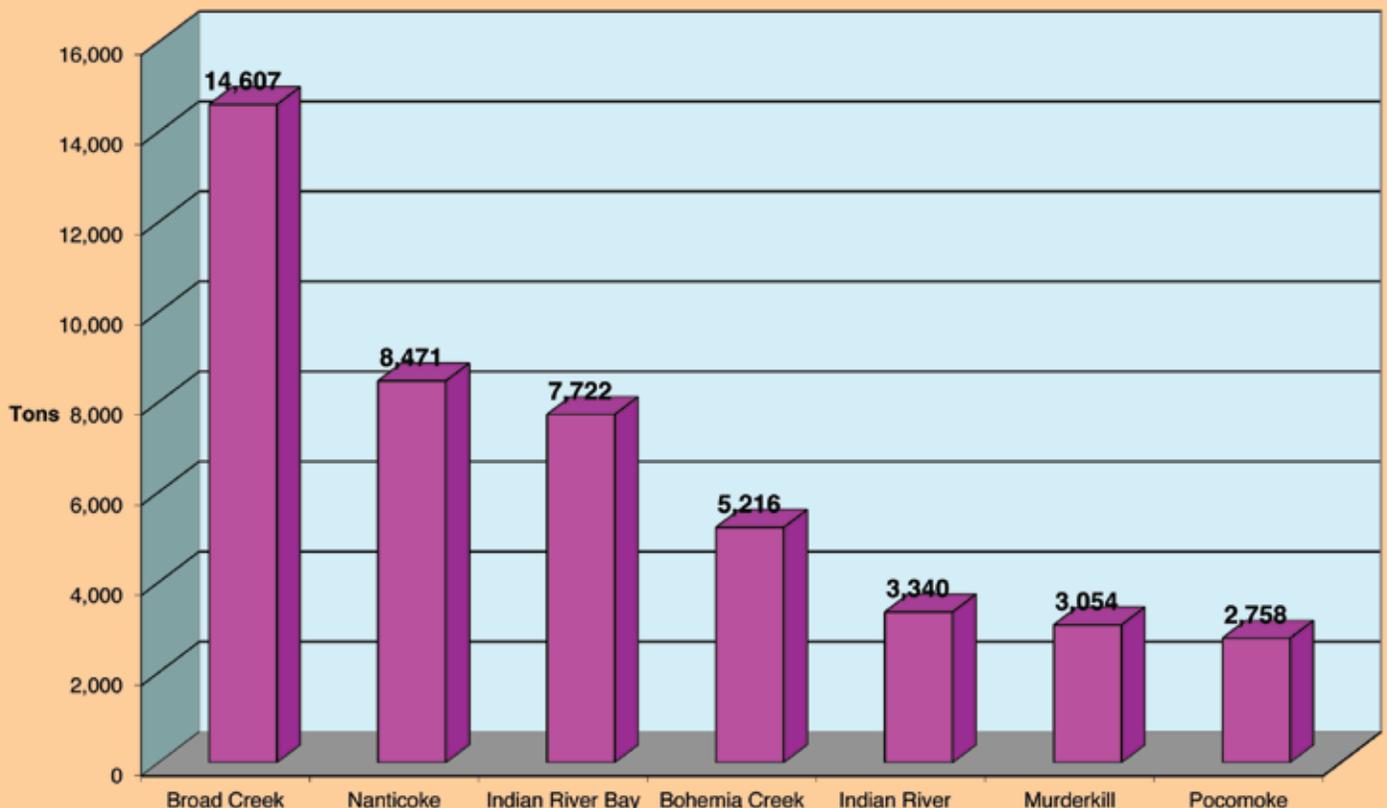
The Relocation Program provides financial reimbursement to farmers, brokers and trucking businesses for the transportation cost of relocating manure from Delaware farms to alternative use projects or other farms for land application. The Relocation Program provides farmers with the option to move the manure themselves or hire a broker. The application process validates eligible senders, receivers, truckers and alternative use projects.

Excess manure continues to be transported for land application throughout Delaware as well as

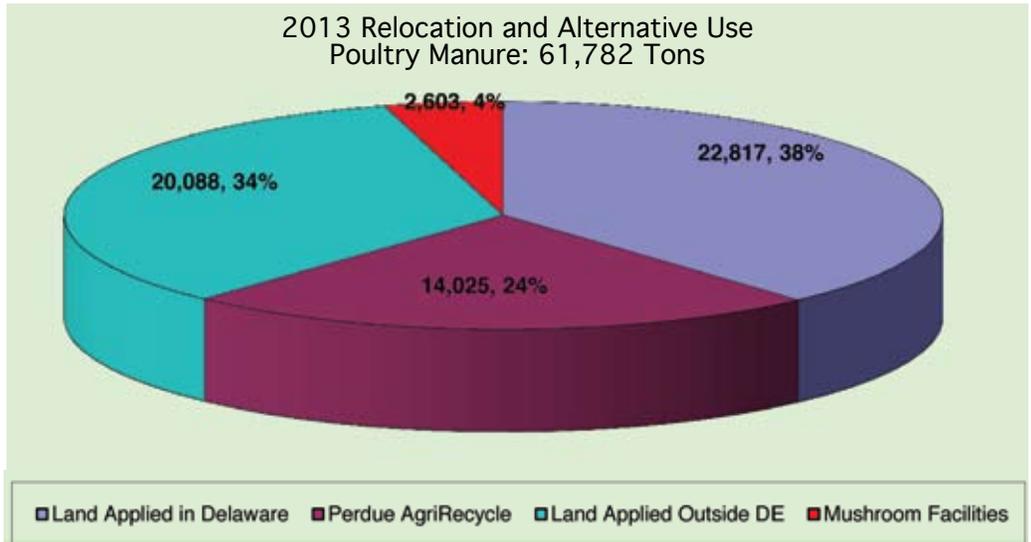


Relocation of Manure to an area where it can be utilized in an environmentally friendly manner is an effective Best Management Practice.

2013 Relocation Tons by Watershed

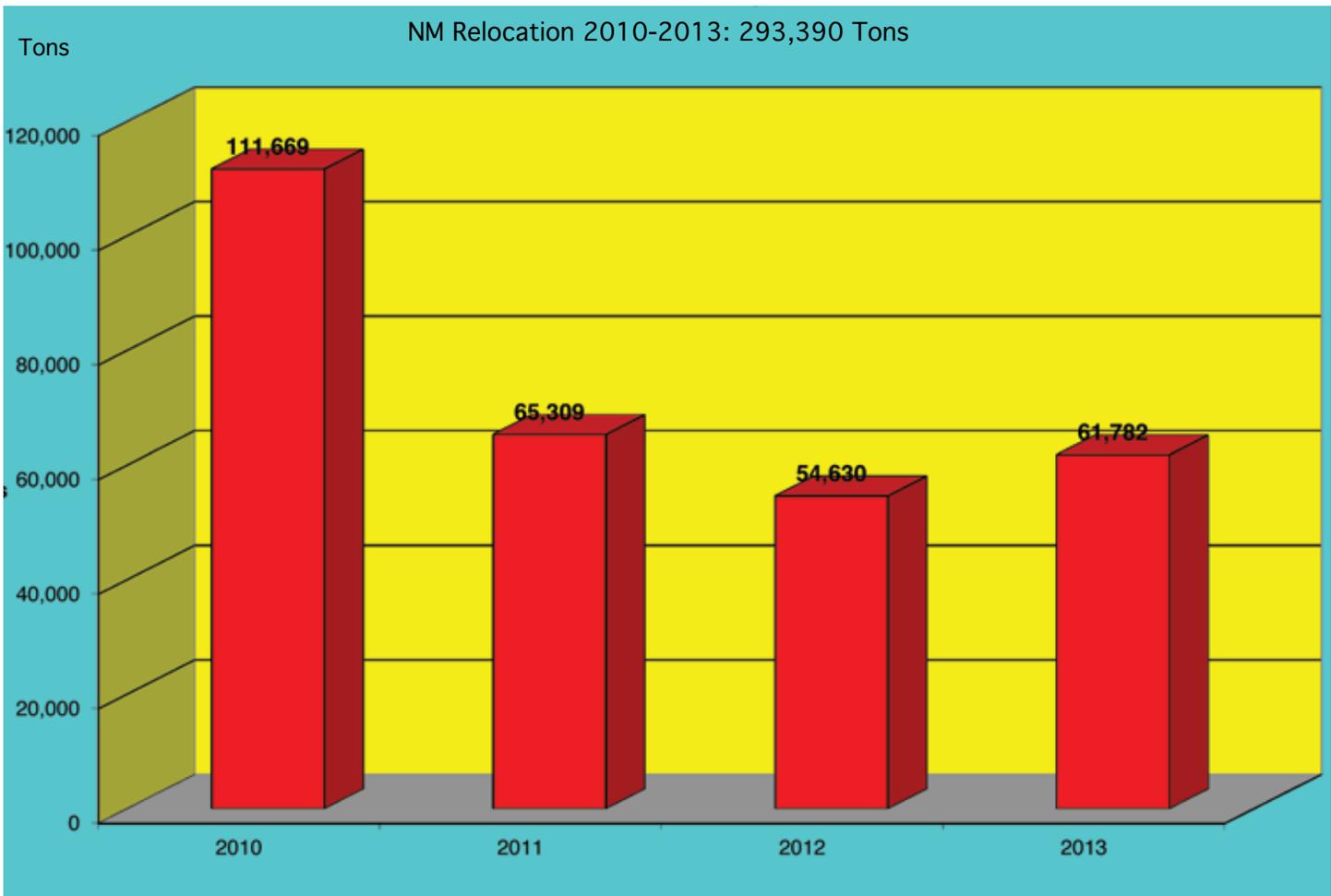


to Maryland, New Jersey, Pennsylvania and Virginia. Alternative use projects are essential for managing excess poultry manure. In 2013, 61,782 tons of excess poultry manure was relocated, for a nine-year total of over 775,000 tons. During 2013, over 31% of the excess manure went to alternative use projects such as the Perdue AgriRecycle fertilizer plant in Blades, DE, and mushroom growers in Pennsylvania.



Farmers and others wishing to participate in relocation projects can contact the Nutrient Management Program at (302) 698-4556.

| FY 2013 Relocation Category | Tonnage |
|--|---------|
| Delaware relocation projects with financial assistance | 61,782 |
| Farm to Farm within DE | 22,817 |
| Farm to Farm exported from DE | 20,088 |
| Farm to Alt. Use: Perdue AgriRecycle | 14,025 |
| Farm to Alt. Use: Mushrooms | 2,603 |



Delaware Environmental Stewardship Program

During 2013 the Commission partnered with the poultry companies that operate in Delaware to recognize environmental stewards within the agricultural community.

The environmental stewardship award was established in 2001 to recognize farmers whose stewardship and general farming practices contribute to the improvement of water quality within the state. The program recognizes growers by evaluating nutrient management, implementation of best management practices, farm management, innovation, biodiversity and wildlife habitat management.

The 2013 Delaware Environmental Stewardship Award was presented on January 13, 2014, during the Delaware Agriculture Week conference held at the Delaware State Fairgrounds in Harrington. Connie Carmean of Laurel was the winner. Mrs. Carmean was presented with a cash award of \$1,000, a lane sign and a plaque. She grows for Mountaire Farms. Also nominated were Richard McGinnis of Dagsboro (Amick Farms), John and Mary Reed of Bridgeville (Perdue) and Larry and Mary Ann McAllister of Laurel (Allen-Harim). All were presented with a check for \$500, a lane sign and a plaque.



From left: William Vanderwende, Commission Chair; Ed Kee Secretary DDA; Connie Carmean, winner 2013 Environmental Steward Award; Beth Sise, Environmental Manager Mountaire Farms; Larry Towle, Program Administrator DNMC. Mrs. Carmean grows for Mountaire Farms.



From left: Jeff Smith, Environmental Manager Perdue; J. D. Custins; William Vanderwende; John Reed; Larry Towle; Ed Kee. Mr. Reed grows for Perdue.



From left: William Vanderwende, Richard McGinnis, Larry Towle, Ed Kee. Mr. McGinnis grows for Amick Farms.

Nutrient Management Program at Delaware Ag Week

The Delaware Nutrient Management Program has had a booth at the Delaware Ag Week since 2012. Nutrient Management Program staff helped farmers complete their annual reports and collected manure samples from poultry, dairy and horse operations to be analyzed by the Delaware Department of Agriculture's Ag Compliance laboratory. Farmers can receive up to one continuing education credit for submitting a completed annual report and manure sample at the Delaware Ag Week.

This initiative was started to improve response rates for the annual reports and to obtain increased manure analysis data for research and evaluation purposes. A total of 70 completed annual reports and 72 manure samples were submitted at the nutrient management booth during 2013 Ag Week. The nutrient management program applauds the response from Delaware's farmers and intends to continue this program at future Ag Week events.



Nutrient Management staff assisted farmers with submission of their annual reports and manure samples at Delaware Ag Week .

Complaint Resolution

Complaints related to manure management and general nutrient management practices are handled and resolved by program staff. Actions against any alleged violation of

the Nutrient Management Law, regulations or standards are investigated by program staff and recommended for action by the Commission.



This manure has been field staged for longer than the allowed 90 days as evidenced by the weeds that have grown in it.

Twenty public complaints were received and resolved by program staff relating to manure management, livestock management, odor and nutrient management certification. The categories of complaints and operation types are as follows:

| | |
|---------------------------|------|
| Complaint Category | |
| Manure management | 80 % |
| Mortality Management | 5 % |
| Odor | 10 % |
| Fertilizer Management | 5 % |
| Operation Type | |
| Poultry | 80 % |
| Horse | 5 % |
| Field Crop Only | 10 % |
| Swine | 5 % |
| Dairy | 0 % |
| Beef | 0 % |

County Conservation Districts

The Commission works cooperatively with County Conservation Districts to promote and implement nutrient-related best management practices. Many practices that are coordinated by the Conservation Districts result in success that helps both the environment and the farmer. Kent and Sussex Conservation District offices staff a total of six Conservation Planners who develop nutrient management plans. The following is a 2013 summary of the Districts' accomplishments:

NEW CASTLE COUNTY

- Construction/Planting Contracts
- Manure storage – 0
 - Cover crop – 7,010 acres
 - Roof runoff structures-1
 - Stream fencing – 7,272 feet

In-House Accomplishments

- CNMP's planned- 1
- Conservation Plan development – 147 “planned” totaling 13,728 acres with 156 “applied” totaling 13,927 acres

KENT COUNTY

- Construction/Planting Contracts
- Manure storage – 4 Poultry
 - Mortality storage – 4
 - Cover crop (planted) – 15,978 acres
 - Concrete pads for manure handling – 27

In-House Accomplishments

- Nutrient Management Plan development – 10/ 2,100 acres
- Animal Waste Plan/ CNMP development – 9
- Conservation plan development – 17,242 planned acres/16,723 applied acres
- Pre-side dress soil nitrate test – 280 tests representing 13,359 acres

SUSSEX COUNTY

Construction/Planting Contracts

- Manure storage – 21
- Mortality storage – 23
- Cover crop – 30,057 acres
- Concrete pads for manure handling – 277

In-House Accomplishments

- Nutrient Management Plan development – 31 plans at 3,037 acres
- Animal Waste Plan / CNMP development – 70 at 2,313 acres
- Conservation plan development – 216 plans at 14,850 acres



Heavy use pads are one of the BMPs cost shared by the County Conservation Districts.

Permits for Certain Animal Feeding Operations

The National Pollution Discharge Elimination System (NPDES) program is a federal program administered by the Environmental Protection Agency under the Clean Water Act (CWA). The Department of Natural Resources and Environmental Control (DNREC) was delegated permitting authority in 1983, to administer the NPDES program for surface water discharges in Delaware. Facilities affected by the Federal NPDES program are defined as point sources of pollution, and these include combined sewage overflows, storm water construction projects, industrial activities, municipal treatment plants, and Concentrated Animal Feeding Operations (CAFOs).

CAFO regulations were jointly promulgated in Delaware by the Department of Natural Resources and Environmental Control and the Department of Agriculture (DDA) on November 11, 2011. A Memorandum of Agreement signed by the Secretaries of each Department on December 16, 2010, is an integral part of the structure of the Delaware NPDES CAFO Permit program.

The Memorandum of Agreement recognized each agency's experience and expertise and identifies the responsibility of each agency in the implementation of the program. This MOA did not transfer any part of the delegated CAFO program to the DDA, but established that DDA would interact with the regulated community as a point of contact and as a facilitator for DNREC.

Since August 2012, Nutrient Management staff has been developing the language of the CAFO permit which focuses on limiting discharges of pollutants as well as the enforcement actions if these limitations are exceeded. The permit language was developed utilizing the Delaware CAFO regulations, the 1999 Nutrient Management Law and the EPA Permit Writers' Manual.

The mission of the DDA Nutrient Management Program is "to maintain agricultural profitability and improve water



Delaware Park in Wilmington received the first CAFO Permit written in 2013.

quality in Delaware." The implementation of our programs support this mission by "regulating those activities involving the generation and application of nutrients in order to help improve and maintain the quality of Delaware's ground and surface waters and to meet or exceed federally mandated water quality standards, in the interest of the overall public welfare."

Since May 2011, Nutrient Management staff has been updating the inventory of poultry operations in the state. The last such inventory was conducted by DNREC and was completed in 2000. During the inventory, staff conducted 473 site visits and provided information on the CAFO permit program. On December 20, 2013, this inventory was completed with a final count of 618 poultry operations. Further outreach to all identified farms will be made to provide educational information regarding the CAFO program.

State Technical Standards

During 2010, EPA initiated actions requiring all the Chesapeake Bay states to adhere to total maximum daily loads (TMDLs) for nitrogen, phosphorus and sediment. Each of these states was required to draft a Watershed Implementation Plan (WIP) laying out water quality goals and a path forward to meet the federally imposed TMDLs.

Part of Delaware's plan for meeting the TMDLs was the successful implementation of the new CAFO regulations. Integral to the CAFO regulations are the accompanying state technical standards (best management practices). These serve as a guide to the proper implementation of the CAFO regulations. Referenced throughout the CAFO regulations are various technical standards for both the production and manure application areas. Use of these standards is crucial for nutrient plan writers, nutrient handlers and agricultural operators. Such use will ensure regulatory compliance

when properly implemented.

In order to meet the state and federal requirements, Secretary of Agriculture Ed Kee formed the Delaware State Technical Standards Review Committee. The Committee was comprised of a group of policy makers from the Nutrient Management Commission, Department of Agriculture, the Department of Natural Resources and Environmental Control, the University of Delaware, USDA/Natural Resources Conservation Service, USDA/Farm Service Agency, and the private sector. All of the Nutrient Management Program's best management practices were reviewed, redrafted, and reformatted. In total, 42 technical standards have been completed to date. Each standard has been peer reviewed. The technical standards are posted on the Department of Agriculture's webpage at: http://dda.delaware.gov/nutrients/NM_TechStandards.shtml.

Managing Nutrients from the Equine Industry

The equine industry is one of the fastest growing sectors of Delaware Agriculture. The state is home to many commercial and hobby stables, as well as several large race horse training facilities, and three public race tracks. Facilities that house seven or more horses (8,000 total pounds or more) or those that apply nutrients to greater than 10 acres are subject to the Nutrient Management Law.



Horses are an important sector in Delaware agriculture.

Operators of such facilities need to be certified as either Nutrient Generators or Handlers, and have a Nutrient Management Plan developed for their farm. This plan allows the operator to better manage the handling of manure to prevent runoff to nearby waterways. Nutrient Management Staff will be conducting more inspections and educational meetings with equine operations in the upcoming year. Inspections will consist of looking at the manure handling practices on the farm, making sure operators are certified with the Nutrient Management Program, and ensuring Nutrient Management Plans are being followed by inspecting farm records.



At Delaware Park, this horse manure bin is under cover.

Poultry Mortality Freezers

On-farm freezer collection is the newest best management practice (BMP) available for handling poultry mortality on Delmarva. Daily mortalities are placed in the freezer units by the grower and the lid is then closed and sealed tightly. Once a farm's current flock ships, the units are emptied, and the frozen birds are hauled away. It will cost the average Delaware farm less than 100 dollars per flock in electricity to run the units. When compared to composting, freezing mortalities strengthens biosecurity, eliminates odors, eliminates scavenger animals, and reduces the nutrient load currently being land applied to farm fields. This method is also much less work and more convenient for the poultry farmer.

Greener Solutions LLC is bringing this innovative BMP to Delmarva and is owned and operated by a local poultry farmer. Greener Solutions LLC places its own freezer units on the farm, regularly services the units, and then empties the units at the end of each flock. Flock deductions for long-term service agreements are already available through some integrators and will be with others in the near future.

Greener Solutions LLC approached the Delaware Nutrient Management Commission with this new management method, seeking approval as an acceptable, alternative practice for handling poultry mortality. The company did a great deal of research in conjunction with the industry, agencies, and extension service officials locally and in other

parts of the country where this practice is currently being utilized.

The Commission has approved the mortality freezers as an acceptable alternative practice, and assisted in funding the installation of freezer units on a trial farm. It is hoped that this method of mortality handling will give farmers a more efficient method to handle mortality.



Farm freezers are a new Best Management Practice available to Delaware for handling daily poultry mortalities.

Water Quality Trends in Delaware and the Region

By Jennifer Volk, University of Delaware Environmental Quality Extension Specialist

Delaware is a very well monitored state. DNREC maintains approximately 145 stream sampling stations where grab samples are collected at least every other month and several additional sites collect data more frequently. Because so much data is available, we know that many of our waters are considered impaired due to high levels of nutrients like nitrogen and phosphorus, which contribute to algal blooms and large fluctuations in dissolved oxygen levels. These conditions negatively impact the ability of aquatic life to survive and thrive in some locations.

A lengthy historic record of water quality data from the Chesapeake Bay watershed, shows that a good majority of stream sites, though, are improving! According to the U.S. Geological Survey (USGS), approximately 70% of its sites are improving for both nitrogen and phosphorus over their long term record (<http://cbrim.er.usgs.gov/trendandyieldhighlights.html>). DNREC's water quality data also show improvements statewide in more recent years, but loading trends are tightly tied to precipitation and the amount of stream flow in any particular year (H. Mirsajadi, oral communication).

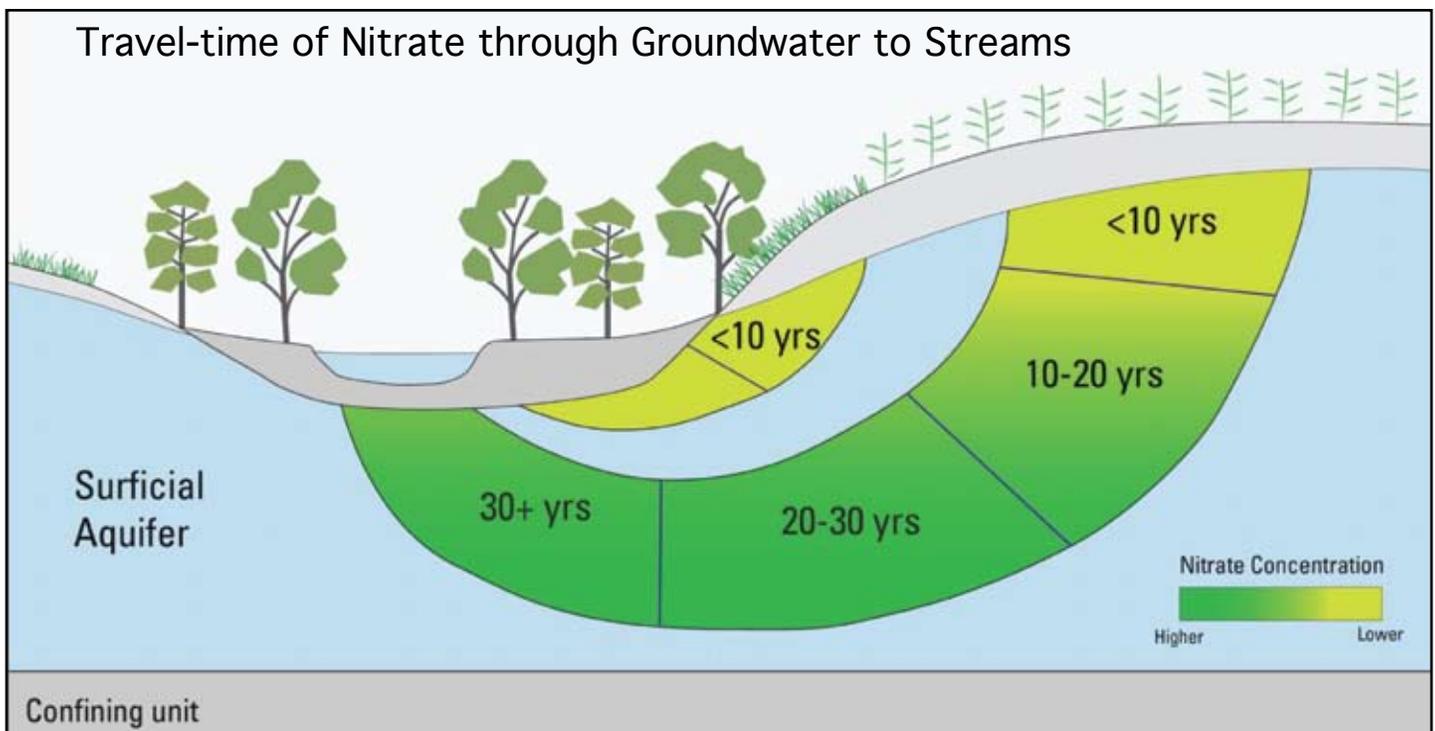
Most of the water in Delaware streams originates as groundwater. When it rains on land, water percolates through our sandy soils and enters the surface aquifer, becoming groundwater. As that water percolates through the soils, it also picks up dissolved pollutants, like nitrogen. But, it can take years to several decades for groundwater to move down and under a landscape to where it finally discharges to a stream. So, the quality of stream water, especially when it is made up primarily of discharging groundwater, really reflects what was happening on the surface of the land years

ago. This is why it is also important to monitor the quality of our groundwater also, since that will give us a sense of how our more recent management actions will be impacting stream water quality.

The USGS has monitored the quality of groundwater across Delmarva several times in the 1990s, early 2000s, and in 2012. When comparing the early 2000s data to 2012, the range of nitrogen concentrations are about the same, but it appears that the median concentration has decreased from about 9 mg/L to 6 mg/L nitrate as nitrogen. This decrease possibly reflects the nutrient management practices employed in our state and region since the late 1990s. Unfortunately, the sample set was not large enough to consider this decrease statistically significant (J. Denver, oral communication). But, this apparent decline is promising and has prompted an increased interest and focus on more thoroughly assessing the condition of shallow groundwater in our region in order to credit nutrient management with water quality benefits.

As it was stated earlier, it takes a long time for groundwater to move and we may still need to wait more than a decade to see improvements in our stream samples. But, understanding this process is vitally important to communicating our nutrient management efforts and progress towards improved water quality.

The image below depicts a theoretical groundwater flow path beneath an agricultural setting and the age and nitrate concentration of that water along the path. The lighter shade of green shows lower levels of nitrate that are believed to be entering area groundwater as a result of utilizing nutrient management practices in recent years. Ideally, continued use of nutrient management over time will result in lower nitrate levels along the entire groundwater flow path and in the streams, too. Image courtesy of Judy Denver, USGS.



Field Staging of Poultry Manure

The most efficient method of handling and storing poultry litter results from handling the litter as few times as possible. Ideally, total cleanouts and crust outs are immediately land-applied, transported to an alternative use facility, or moved to a storage structure. However, timing considerations may require temporary, outdoor storage of the total cleanout of litter before use and must be conducted according to the State Technical Standards. In situations where temporary field staging is needed, litter may be stored temporarily to preserve litter quality and prevent application at the wrong time of the year. Temporary field staging is the least preferred storage practice.

This is an example of properly field staged manure. Research has shown that staging in this manner allows the manure to form a crust and shed water without losing nutrients.



Winter Application of Fertilizer and Manure

Winter application regulations limit the application of commercial fertilizer and manure during that time of year where such applications are most prone to cause nutrient runoff. The purpose of the regulation is to limit the application of Nitrogen (N) and Phosphorus (P) fertilizer and manure applications as follows. Exceptions may be allowed under emergency conditions if they are specified in the farmer's nutrient management plan. Such exceptions usually involve liquid manure.

The winter nutrient application ban dates are:

- The application may not occur starting December 7 and continuing through February 15;
- The application may not occur on snow-covered or frozen ground;
- The application may not occur on impervious surfaces such as sidewalks, road and other paved areas and the misdirected fertilizer must be removed on the same day of application.

Failure to comply with these regulations may result in a compliance and enforcement hearing by the Commission.



Spreading manure between December 7 and February 15 is no longer allowed in Delaware. Such activity may result in administrative action by the Commission.

Handling Catastrophic Mortality



This channel composter is designed to handle routine mortalities. For mass mortalities a larger structure would be needed.

Every animal operation's nutrient management plan is designed to address daily and catastrophic mortalities. Most daily mortalities are handled in environmentally friendly manners such as composting. Most farms are not designed to handle large-scale mortality events such as what Delaware experienced during the winter of '09/'10. Many farmers faced the challenge of handling large amounts of mortality from roof collapses caused by snow accumulation. The following recommendations were provided to the poultry industries and growers as they dealt with catastrophic mortalities.

Mortalities may be dealt with by:

- Composting onsite in a covered structure such as a manure shed. It is important that the proper amount of carbon is used in order to rapidly heat the pile and promote the breakdown of the birds. In general, the mortality to carbon ratio is one to one. Acceptable carbon sources are straw, wood chips or shavings.
- Relocating the mortalities to a commercial composting site.
- Relocating the mortalities to a landfill. This option requires coordination and approval with the landfill.

Budget

| | FY 2011 | FY 2012 | FY 2013 |
|--|------------------|------------------|------------------|
| | Budget | Budget | Budget |
| Program Operating Costs: | | | |
| Personnel | 240,700 | 299,800 | 306,800 |
| Federal Funds Section 319 (Clean Water Act) | 30,000 | 30,000 | 30,000 |
| Travel | 600 | 600 | 600 |
| Contractual | 16,000 | 16,000 | 16,000 |
| Supplies | 4,000 | 4,000 | 4,000 |
| Information/Education/Certification | 172,500 | 172,500 | 172,500 |
| Nutrient Relocation Program | 246,000 | 246,000 | 246,000 |
| Federal Funds section 319 (Clean Water Act) | 200,000 | 100,000 | 99,000 |
| Federal Funds Ches. Bay Program | 150,000 | 150,000 | 150,000 |
| Poultry Companies | 164,000 | 187,000 | 212,500 |
| Nutrient Management Planning | 411,800 | 411,800 | 411,800 |
| Penalties Collected | 0 | 0 | 0 |
| Cover Crops | 0 | 0 | 55,400 |
| TOTAL | 1,635,600 | 1,617,700 | 1,704,600 |

Members of the Nutrient Management Commission



William Vanderwende, Commission Chairman, was appointed to the Commission by the Senate, and was named Chairman by the Governor. He is a full-time Sussex County dairy producer who represents the state's dairy industry. He operates a farm with 700 head of dairy, and

3,000 crop acres. He can be reached at (302) 349-4423.

David Baker, Commission Vice Chairman and Chairman of the Personnel and Planning Subcommittees, was appointed by the Senate as a representative of the New Castle County grain industry. He is a full-time grain farmer of 3,000 acres. He can be reached at (302) 378-3750.



Robert Baldwin is the Agricultural Liaison for the Department of Natural Resources and Environmental Control and is appointed by the Nutrient Management Law. He can be reached at (302) 739-9921.



Chris Bason is the representative of an environmental group. He was appointed by the Senate Minority Leader. He is the Executive Director of the Delaware Center for the Inland Bays, one of the State of Delaware's two National Estuary Programs. He is a biologist with 14 years of experience in wetlands and estuarine science and can be reached at (302) 226-8105.



Mark Adkins was appointed by the Governor to represent swine farmers. He operates a 900-acre family grain farm and 1,000-head swine farm and is a director for the Delaware Pork Producers. He can be reached at (302) 732-3007.

F. Kenneth Blessing, Jr., was appointed by the Senate to represent Kent County vegetable farmers. He is part of a diversified farming operation consisting of approximately 3,500 crop acres including vegetables, grain and beef cattle. He can be reached at (302) 422-5746.





Lisa McCormick was appointed by the Governor as a Sussex County public citizen representative. She can be reached at (302) 988-8235.



Richard Sterling was appointed by the Governor as a representative of the commercial nursery industry. He operates a 75-acre nursery specializing in evergreens. He can be reached at (302) 653-7060.

Jim Elliott was appointed by the House of Representatives as an Environmental Advocacy Group representative. Former Mayor of Fenwick Island, he is no stranger to public service. He can be reached at (302) 337-3653.



Scott Webb was appointed by the House of Representatives to represent Kent County poultry farmers. He is part of a family farm that operates a 119,000-capacity broiler operation and farms 1,000 acres of grain crops. He can be reached at (302) 381-0402.



Laura Hill was appointed by the House of Representatives to represent Sussex County poultry farmers. She is part of a family farm that operates a 130,000-capacity broiler operation and farms 3,000 acres of grain and vegetable crops. She can be reached at (302) 945-0725.



Ed Kee, Secretary of the Delaware Department of Agriculture, is an ex-officio member of the Commission. He can be reached at (302) 698-4500.

Jessica Inhoff, member of the Technology Subcommittee, was appointed by the Senate as a Nutrient Consultant. She began her career in agriculture in 1996 and has been part owner of AET Consulting, Inc., since 2002. She may be reached at 302-540-8998.



Dr. Har Ming Lau serves for Secretary Rita Landgraf and is currently the Chief Toxicologist with the Office of Environmental Health and Toxicology at the Division of Public Health, within the Department of Health and Social Services. He also serves as the Deputy Section Chief for Health Systems Protection at the Division of Public Health. He received his



Medical Degree from Temple University and has extensive experience in medical pathophysiology, chemical toxicology, human health risk assessment, environmental health sciences and environmental chemistry. His position is ex-officio and he can be reached at (302) 744-4705.



Ken Horeis was appointed by the Speaker of the House of Representatives to represent the equine industry. He has owned, bred and shown horses his entire life. He is a long time member of the Delaware Equine Council, currently serving as vice-president.

Bud O'Neill was appointed by the Governor as a representative for the golf course/lawn care industry. He owns an agronomic service firm that plans and manages turfgrass for golf courses, athletic complexes and lawns. He is past chairman of the Delaware State Golf Association greens section and can be reached at (302) 653-8618.



David Small, Deputy Secretary of the Delaware Department of Natural Resources and Environmental Control, is an ex-officio member of the Commission. He can be reached at (302) 739-9000.

Delaware Nutrient Management Program Staff



W. Larry Towle is the Program Administrator of the Delaware Nutrient Management Program and an ex-officio member of the Nutrient Management Commission. He can be reached at (302) 698-4500 or larry.towle@state.de.us.



Judy Baines is the Administrative Assistant for the Delaware Nutrient Management Program. She can be reached at (302) 698-4558 or judy.baines@state.de.us.



Lauren Torres is an Environmental Scientist for the Delaware Nutrient Management Program. She can be reached at (302) 698-4628 or lauren.torres@state.de.us.

Bob Coleman is the Environmental Coordinator for the Delaware Nutrient Management Program. He can be reached at (302) 698-4556 or Robert.coleman@state.de.us.



Ben Coverdale is also an Environmental Scientist for the Delaware Nutrient Management Program. He can be reached at (302) 698-4627 or Michael.coverdale@state.de.us.

University of Delaware Staff

Several specialists from the University of Delaware provide certification training for the Nutrient Management Program. They also assist the program by providing technical recommendations and by conducting research and demonstration projects on nutrient management practices. They are:

Phillip Sylvester, Kent County Extension Office, at (302) 730-4000.

Shawn Tingle, Extension Associate, at (302) 856-2585, Ext. 572.

Corey Whaley, Sussex County Extension Agent at (302) 856-2585, Ext. 594.

Sydney Young Riggi, Extension Associate, at (302) 856-2585, Ext. 571.

Amy Shober, Assistant Professor, Dept. of Plant and Soil Science, at (302) 831-2146.

Jennifer Volk, Environmental Quality Extension Specialist, at (302) 730-4000.

How to Contact Your Conservation District

The Conservation Districts provide technical agricultural professionals who can assist in nutrient management strategies and recommendations. All nutrient consultants are certified and in most cases, are certified crop advisors.

New Castle County – (302) 832-3100

Kent County - (302) 741-2600

Sussex County – (302) 856-3990



How to Contact the Nutrient Management Program

Information about the Nutrient Management Program can be found on the Internet at www.state.de.us/deptagri/nutrients/index.shtml.

Delaware Department of Agriculture Nutrient Management Commission
2320 S. DuPont Highway
Dover, DE 19901
800-282-8685 or 302-698-4500

*Water Quality is
Everyone's Responsibility*