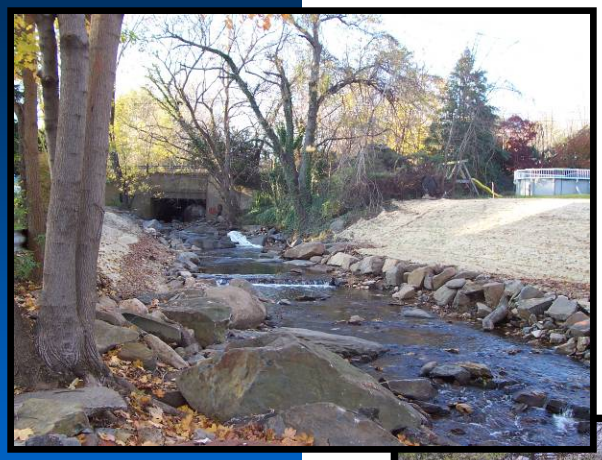
Delaware

NONPOINT SOURCE PROGRAM ANNUAL REPORT



2007

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Nonpoint Source Program
89 Kings Highway
Dover, Delaware 19901

Phone: 302-739-9922
Fax: 302-739-8017
www.dnrec.delaware.gov

DELAWARE NPS NONPOINT SOURCE PROGRAM

Delaware's Nonpoint Source Program

Introduction

This publication represents the State of Delaware's Nonpoint Source Program 2007 Annual Report. Section 319 of the Clean Water Act requires each State to report annually on progress in meeting nonpoint source management program milestones, and to report available information on reductions in nonpoint source loadings and improvements in water quality.

The Delaware Nonpoint Source (NPS) Program administers a competitive grant made possible through Section 319 of the Clean Water Act. The grant provides funding for projects designed to reduce nonpoint source (NPS) pollution in Delaware. Reduction of NPS pollution is most often achieved through incorporation of specific best management practices (BMPs) into project workplans. Proposals are reviewed and evaluated, and those which are determined to meet specified requirements are eligible for funding. At least 40 percent of the overall project cost of all projects must be represented by non-federal matching funds.

In 2007, projects funded through the Delaware's NPS Program embarked on many water quality improvement activities including further support of the Delaware Clean Marina Program, stream restoration projects, shoreline stabilization projects and agricultural BMP implementation projects.

Additionally, routine and ongoing projects made great strides during the year and proved, once again, successful NPS pollution reduction strategies. Examples of the routine funded activities include the Nutrient Relocation Program and the Kent and Sussex Conservation District Planners. Details of each of these activities will be found in the pages that follow.

New to Delaware's Annual Report is the inclusion of several targeted watersheds and NPS related activities occurring therein. For 2007, we have chosen to highlight an update for the Perkins Runs Stream Restoration Project in the Perkins Run Watershed as well as highlight ongoing activities occurring in the St. Jones and Broadkill Watersheds. Exciting and progressive NPS strategies and activities are being pursued in these areas of Delaware!

There have been many improvements made in watershed assessment and planning approaches and methodologies through the Pollution Control Strategies development process. Public support and involvement will prove to be the key in the successful implementation of any strategy that is developed. Delaware's Nonpoint Source Program will continue to work with our partners in 2008 and beyond to make further progress towards meeting the State's water quality goals.

Contact Information

Delaware Nonpoint Source Program
DNREC Division of Soil & Water Conservation
89 Kings Highway
Dover, DE 19901
Telephone: (302) 739-9922
Fax: (302) 739-8017

Delaware NPS Program Staff

Bob Palmer, Program Manager	robert.palmer@state.de.us
Mark Hogan, Planner	mark.hogan@state.de.us
Sharon Webb, Environmental Scientist	sharon.webb@state.de.us
Jen Nelson, Environmental Scientist	jennifer.nelson@state.de.us
Brenda Zeiters, Administrative Specialist	brenda.zeiters@state.de.us

NPS Staff

Delaware's Conservation Reserve Enhancement Program

Introduction

The Delaware Conservation Reserve Enhancement Program (CREP) was established in Delaware in 1999 with a designated goal of improving water quality, establish wetlands and enhancing wildlife habitat in the coastal plain geographic areas of the Delaware, Chesapeake, and Inland Bays watersheds. The Delaware CREP Program is a voluntary, incentive-based federal program that pays farmers and landowners attractive incentives for converting their least productive lands into a conservation practice that the landowner chooses for a contract period of 10 - 15 years. Landowners can establish forests, create wetlands, plant native warm-season grasses, or cool season grasses. In return the landowner receives cost-share, annual rental payments, and generous bonus payments.

CREP Conservation Partners Sign

Agencies cooperating in Delaware include: the Department of Natural Resources and Environmental Control (DNREC), Division of Soil & Water Conservation, and the Delaware Department of Agriculture (DDA), Forestry Division. In addition, the CREP Program is assisted by the three conservation districts in Delaware as well as the USDA Natural Resources Conservation Service, the U.S. Fish and Wildlife Service, and the University of Delaware. In order to coordinate and maximize assistance provided to voluntary cooperating landowners, a full-time CREP Coordinator was hired with funds provided by Section 319 of the Clean Water Act.

The goals established by the Delaware CREP program are as follows:

1. Reduce nutrient and sediment loadings to impaired streams;
2. Meet water temperature and dissolved oxygen criteria necessary to support aquatic species; and
3. Increase upland wildlife habitat and create wildlife corridors.

The following CRP practices were selected in Delaware to achieve these goals:

1. CP21 Grassed Filter Strips
2. CP22 Riparian Buffers
3. CP23 Wetlands Restoration
4. CP3A Hardwood Tree Planting
5. CP4D Permanent Wildlife Habitat

Delaware CREP Program Progress and Funding

Delaware initially set a goal of establishing 6,000 acres of selected practices to meet the goals of the Delaware CREP Program. To date over 5,000 acres have been installed under contracts of 10 and 15 year terms. The table found within Appendix (A) lists the practices installed during the 2007 calendar year, watershed, and the financial contributions made by the State and private landowners. The table found within Appendices (B) summarizes the cumulative CREP practices installed during the calendar years 2001 through 2007. Appendixes C and D represent practices located throughout Delaware and on a watershed scale.

Currently the USDA Farm Service Agency pays 50% of installation costs for CREP practices and the State of Delaware pays 37.5% of the costs. On practices CP21, CP9 and CP4D FSA pays 64% of the incentive payments and Delaware pays 36%. For practices CP22, CP23, CP23A and CP3A FSA pays 73% and Delaware pays 27%.

To provide additional incentives for participation, the partners recently adopted revisions to the Delaware CREP Agreement. The following list of changes was established in 2007 in an effort to expand the program and improve its viability to participants:

1. Add practice CP23A Wetland Restoration (non-floodplain).
2. Add practice CP9 Shallow Wildlife Pond.
3. Modify practice CP4D to increase acreage allowable per Farm Tract to ten acres or ten percent of cropland instead of the current five acres or five percent.
4. Add an area of coastal plain in eastern Kent County previously not included in program area.
5. Increase total CREP acreage to 10,000 acres.

Now that these amendments have been initiated, DNREC's NPS Program is undergoing a wide advertisement campaign highlighting the enhanced and expanded Delaware CREP Program specifically addressing the increase of available acreage and the addition of the CP23A and CP9 eligible practices.

Education and Outreach

USDA's Farm Service Agency and the State of Delaware unveiled advertisement signs on April 26 celebrating the Conservation Reserve Enhancement Program. The signs are used as an informational tool to educate the public about the most popular practices in Delaware's CREP Program. The unveiling included Robert Baldwin, Director of DNREC's Division of Soil and Water Conservation; John Hughes, Secretary of DNREC; Governor Ruth Ann Minner; Richard Bergold, FSA State Executive Director; Lynn

Manges, FSA Program Specialist; Michael Scuse, Secretary of DDA; and, Dale Churchey, Delaware CREP Program Coordinator.

The USDA, State of Delaware and cooperating partners have used multiple media sources to inform the public and landowners of the benefits and accomplishments of the Delaware CREP Program. Public meetings, PowerPoint presentations, newspaper articles radio programs, and television spots have all been used to extol the availability and benefits of the program.

In 2007, a special picture and word display describing Delaware's CREP program was made available to the public at the 2007 State Fair and Delaware Ag Week. Handouts and participating DNREC volunteers were available to explain the program to the public. *Left to Right: Robert Baldwin (DNREC), Secretary John Hughes (DNREC), Governor Ruth Ann Minner, Richard Bergold (FSA), Lynn Manges (FSA), Secretary Mike Scuse (DDA), and Dale Churchey (CREP Program Coordinator.)*

New CREP Advertising Sign

Monitoring

Due to the widespread areas of practice installation specific detailed monitoring is currently impractical. However, using calculations developed through the Inland Bays Pollution Control Strategy process an estimate of cumulative CREP reductions by watershed in nitrogen, phosphorous and sediment loads are as follows:

Pollutant	***Reduction Units***
Nitrogen	185,209 Pounds/Year
Phosphorus	8,263 Pounds/Year
Sediment	33,071 Tons/Year

These figures demonstrate the amount of each pollutant that will not reach surface and ground waters as a result of CREP practice installation. Load reductions have been incorporated into the TMDL process, both for loads credited as already reduced and for future reductions from additional implementation.

New CREP Advertising Sign

Kent Conservation District Agricultural Conservation Planners

Introduction

The Kent Conservation District (KCD) is a governmental subdivision of the State of Delaware authorized by state legislation in Title 7 of the Delaware Code, Chapter 39 and is responsible for conservation work within Kent County. In Delaware there is a conservation district in each county. KCD functions to focus attention on land, water and related resource problems; develop programs to solve the problems; enlist and coordinate help from public and private sources to accomplish the District goals; and increase awareness of the relationship between human activities and the natural environment around us. It is the Board of Supervisors' responsibility to plan and direct the District programs, coordinate the help of governmental agencies, assign priority to requests for conservation technical assistance from private landowners, and serve as a community clearinghouse for

information services. The KCD Board of Supervisors meets monthly and all meetings are open to the public.

Much of the Districts' effectiveness is due to their ability to work with local, state, and federal agencies to solve local environmental problems. KCD enters into agreements (memorandums of understanding) with cooperating agencies and organizations that outline the obligations of each party and the assistance available. KCD operations are supported by federal, state and local governments and private individuals. The USDA Natural Resources Conservation Service (NRCS) and the Delaware Department of Natural Resources and Environmental Control (DNREC) provide technical leadership to KCD. Additional cooperating agencies include: the University of Delaware's Cooperative Extension Service, the USDA Farm Service Agency, the Delaware Department of Agriculture (DDA), and the First State Resource Conservation and Development Council.

KCD receives an annual allocation from the NPS Program, made up of CWA Section 319 funding and State established finances, used to employee Conservation Planners and to provide cost-share with landowners for environmentally sound improvements of their land. This funding also provides a portion for personnel and administrative costs to run the program. KCD also receives funding from the state and county government to address the needs of the tax ditch systems within Kent County. Additional funding is received through special conservation grants and equipment rental. For details regarding KCD load reductions, please refer to Appendix E.

Employees within KCD provide technical, administrative, and clerical support to district programs. At times, Earth Team Volunteers assist with carrying out the District's conservation programs. KCD works directly with farmers, landowners, and municipalities on the following types of challenges: water quality protection; stormwater management; aquifer protection; land use planning; erosion and sediment control on land undergoing development, farmland, critical areas and public lands; flooding problems; wetlands protection; soil survey information; and sustainable agriculture.

Partnerships

The USDA's Natural Resources Conservation Service and Farm Service Agency provided technical and financial assistance through a cost-sharing program to cooperating landowners for conservation practices. Cost-sharing through the Environmental Protection Agency (EPA) enabled the District to continue work toward the reduction of non-point source pollution. Funding from the State of Delaware and Kent County Levy Court allowed the continuation of the community drainage program and resource development. The Kent Conservation District is charged under state law with the responsibility to protect and enhance the soil and water resources of the State. It has been given broad authority, the most significant of which is to enlist the aid of state and federal agencies.

Districts were conceived as local bodies to bridge the gap between the landowner and the federal agency charged with protecting the nation's soil resources from erosion – the Natural Resources Conservation Service of the United States Department of Agriculture. The NRCS is a professional organization administering a number of federal soil conservation programs, some through the Districts. The team of professionals reach the landowner through District memorandums of understanding with the USDA and the NRCS. A working relationship has developed that is mutually effective. The presence of USDA-NRCS in Delaware was a result of an initial request by the Conservation Districts.

Additional cooperating agencies include:

- The University of Delaware's Cooperative Extension Service
- The USDA Farm Service Agency
- The Delaware Department of Agriculture (DDA)
- The United States Fish & Wildlife Service
- The First State Resource Conservation and Development Council
- EPA Chesapeake Bay Program
- Delaware Nutrient Management Commission
- National Association of Conservation Districts

New Soft Roof Manure Shed at the Dulin Brothers Farm

<u>Conservation Cost Share Program</u>

The General Assembly provided $865,000 in cost-share funds, which were utilized by different cooperating landowners. Projects implemented emphasized water quality, water management, and erosion/sediment control. Funds were allocated for the practices below:

Poultry Heavy Use Area Protection	16	Pads
Poultry Manure Structures	8	Each
Dead Bird Composters	7	Each
Manure Spreaders	3	Each
Front-end Loaders	6	Each
Fencing for Rotational Grazing	5,922	Sq. Feet
Cover Crops	13,575	Acres
Tile Drainage	6,922	Feet
Farm Drainage	16,590	Feet
Dairy Manure Storage Tank	1	Each
Dairy Liquid Pump	1	Each
Horse Manure Dump Wagon	1	Each
Controlled Inlet Piping	1,900	Feet
Grassed Waterway	1,105	Feet

Funds were also provided for each of the following: calf/heifer manure waste structure, dairy waste water spray irrigation system, aquaculture waste water spray irrigation system, fencing for dairy intensive grazing, and a manure storage structure and heavy use area protection for a high school agriculture program.

Conservationists completed a total of 297 inspections of installed practices to ensure the practices are working properly and do not need any maintenance.

State Revolving Loan Fund Program - KCD Efforts

The State Revolving Loan Fund (SRF) program is designed to provide low-interest financing at the rate of 3% for the implementation of best management practices.

Cooperators were assisted in the SRF application process on the following projects:

Composters	2	Each
Front-End Loaders	3	Each
Poultry Manure Structures	6	Each
Manure Spreaders	1	Each
Heavy Use Area Protection (Poultry)	2	Each
Dairy Ag Waste Systems	1	Each

Conservation Reserve Enhancement Program - KCD Efforts

This money was used to install conservation practices on marginal cropland to improve water quality and enhance wildlife habitat. A total of 21 contracts were signed on 8 farms.

Funds in the amount of $23,871 were obligated to cover the estimated establishment costs for establishing the practices. The practices cover 184.5 acres and are broken down as follows:

Hardwood Tree Planting	134.8	Acres
Wildlife Upland Habitat	13.3	Acres
Shallow Water Area for Wildlife	10.3	Acres
Filter Strips	19.6	Acres
Wetland Restoration	6.5	Acres

Environmental Quality Incentive Program (EQIP) - KCD Efforts

The total amount of EQIP cost-share funds earned for the year was $1,231,610.22. This money was used for the implementation of the water quality practices listed below:

Access Road	990	Feet
Composters	3	Each
Comprehensive Nutrient Mgmt. Plans	8	Each
Fencing	27,533	Feet

Forage Harvest Management	40	Acres
Heavy Use Area Protection	11	Each
Irrigation Sprinkler Systems	16	Each
Irrigation Water Conveyance Systems	6	Each
Irrigation Water Management Systems	10	Each
Micro-irrigation System	4	Each
Nutrient Management	786.4	Acres
Pasture and Hay Planting	94	Acres
Pest Management	786.4	Acres
Pipeline	4,550	Feet
Pumping Plant	1	Each
Residue Management	241	Acres
Waste Storage Facilities	8	Each
Water Wells	1	Each
Watering Facilities	21	Each
Windbreak / Shelterbelt	3,934.5	Feet

Nutrient Management Program - KCD Efforts

The District, in cooperation with the University of Delaware Cooperative Extension Service, continued to provide pre-side dress soil nitrate tests (PSNT) to all interested corn growers in Kent County. Use of this test can result in economic savings and reduce the chance of groundwater contamination by nitrates. In 2007, a total of 249 samples were tested covering 10,045 acres. The District's conservationists also worked with cooperators in testing manure as well. Last year the following numbers of manure samples were tested: dairy - 1; poultry - 27; horse - 8; beef - 5; and sheep - 1. The conservationists also completed 9 animal waste plans and 20 nutrient management plans covering 5,102 acres.

Front End Loader

KCD Education Initiatives & Awards

Governors Conservation Awards

Governor Ruth Ann Minner presented the 12th Annual Governor's Conservation Awards to winners from all three counties during a ceremony proclaiming Soil & Water Stewardship Week in Delaware. The recipient of this award representing agricultural conservation in Kent County were Ted and Maria Bobola of Bobola Farms in Dover. The Bobola's operate a nursery as well as three poultry houses. They have installed a poultry manure storage structure, a channel composter, two low-pressure center pivot irrigation systems and participate in nutrient and pest management programs.

The recipient of this award representing urban conservation in Kent County was Crouse Brothers Inc. Crouse Brothers was selected for being a very cooperative, enthusiastic

contractor implementing several new and innovative erosion control practices on project sites located throughout Kent County. By consistently exceeding the requirements of the State's Sediment and Erosion Control Regulations, they have improved the water quality of their projects, thereby protecting Delaware streams and waterways.

Delaware Envirothon - KCD Efforts

The KCD again supported the Envirothon, a problem-solving, natural resource education program for high school students. The competitive nature of the program motivates students to expand their knowledge of natural resources and realize their responsibility as stewards of our natural resources. The students answer written questions and conduct hands-on investigations of environmental issues in five categories: aquatic ecology, soils/land use, forestry, wildlife, and a current environmental issue which was *Alternative/ Renewable Energy*. Thirteen teams competed in the competition. Kent County teams included Polytech High School Team A and Team B and Kent County 4-H. Honors for the Kent County teams included the following:

- Kent County 4-H: 2nd Place - Overall; 1st Place - Kent County; 2nd Place - Soils; 2nd Place - Wildlife; and 3rd Place - Alternative/Renewable Energy
- Polytech High School Team A: 3rd Place - Overall; 2nd Place - Kent County; 3rd Place -Aquatic Ecology; 3rd Place - Forestry; and 3rd Place - Wildlife
- Polytech High School Team B: 3rd Place - Kent County; 2nd Place - Aquatic Ecology and 2nd Place - Public Speaking

10th Annual Barn Dance

The 10th Annual Barn Dance was held on September 14th at the Delaware State Fair Dover Building. Guests enjoyed a fantastic barbecue pork and chicken dinner cooked by Ron & Kaye Argo. Other activities included a silent auction, a live auction by Bruce Betts, and dancing to Just Kidding Around Entertainment. The 301 attendees helped to raise a little over $13,488 for the Delaware Envirothon.

Cooperator of the Year

The Busker Family Dairy was started by Chuck and Charmaine Busker in Harrington in the 1970's. With the help of their children Phillip and Sarah, this once small dairy has grown to accommodate a herd of 200 Holstein Cows, 100 of which are currently milking. This past year the Busker's have completed a manure handling and storage facility. The family tills 250 acres of minimal and no-till forage and grain crops that they utilize on the farm as feed for the cows. They participate in the cover crop program and have recently finished construction of a covered dry cow facility. To aid in manure management they have purchased a front-end loader and spreader, and they installed two large Heavy Use Area Protections (HUAP) and several smaller ones throughout the farm.

Outreach Efforts
The District participated in the following activities to promote environmental awareness:

- Distributed Soil and Water Stewardship Week materials to local churches, schools and libraries
- Staffed the Delaware Conservation Partnership display at the Delaware State Fair
- Provided news releases announcing the NACD Annual Photo Contest
- Participated in the Science Alliance's *"What in the World"* career awareness program at six elementary schools
- Sponsored an environmental poster contest
- Participated on the planning committee and provided volunteers for DNREC's Make-a-Splash water festival
- Gave a presentation about conservation and soils to the St. Peter's preschool class
- Participated in South Dover Elementary School's Super Science Day by giving a presentation on conservation practices and soils

Sussex Conservation District Agricultural Conservation Planners

Introduction
Conservation districts had their beginning in the 1930s when Congress, in response to national concern over mounting erosion, floods and the sky-blackening dust storms that swept across the country, enacted the Soil Conservation Act of 1935. The act stated for the first time a national policy to provide a permanent program for the control and prevention of soil erosion, and directed the Secretary of Agriculture to establish the Soil Conservation Service to implement this policy. The conservation district concept was developed to enlist the cooperation of landowners and occupiers in carrying out the programs authorized by the act.

To encourage local participation in the program, President Roosevelt sent all state governors a Standard State Soil Conservation Districts Law, with a recommendation for enactment of legislation along its lines. On March 3, 1937, Arkansas became the first state to adopt a law modeled on the Standard Act. On August 4, 1937, the first conservation district, the Brown Creek Soil Conservation District, was established in North Carolina. Interestingly enough, the Brown Creek District included the birthplace of Dr. Hugh Hammond Bennett, the first Chief of the Soil Conservation Service - commonly referred to as the father of soil conservation. By 1938, twenty-seven states had followed suit, and by the late 1940s, all fifty states had adopted similar legislation. Districts laws were adopted in the 1960s by Puerto Rico and the Virgin Islands, and in the 1980s by the District of Columbia, Guam, and the Northern Mariana Islands.

Partnerships

A relationship between the Sussex Conservation District (SCD) and the USDA Natural Resources Conservation Service (NRCS) began in the 1940s with the inception of the Conservation Districts. The NRCS provides technical supervision in efforts to protect and enhance our natural resources and improve water quality. NRCS manages several programs to protect natural resources, and the conservation district helps deliver these programs to the farming community. The success of these programs falls directly on the shoulders of both agencies and the working relationship that is in place ensures that these programs are delivered with great success.

Another agency that the SCD has a MOU with is the DNREC. There are agreements with several of the divisions within DNREC, including the NPS Program, and the Division of Water Resources. DNREC enters into these agreements with the conservation district because of the District's ability to work at the local level, with many organizations and government agencies. The SCD is very effective in coordinating efforts between more than one agency. For example, SCD has brought together representatives from the state, federal, and county government agencies with great success. This too is a long standing relationship. Also, the DSWC - District Operations provides guidance and leadership on many issues that face the district.

The following is a list of cooperating agencies that the SCD works closely with to meet its goals of improved and enhanced water quality and protection of natural resources:

- USDA - Natural Resources Conservation Service
- USDA - Farm Service Agency
- U.S. Fish and Wildlife Service
- DNREC - Division of Soil and Water Conservation
- DNREC - Division of Water Resources
- Delaware Department of Agriculture
- University of Delaware Cooperative Extension Service
- Sussex County Council
- Center for Inland Bays
- EPA – Chesapeake Bay Program
- Delaware Nutrient Management Commission
- National Association of Conservation Districts

2007 Summary

Agriculture

Funded through a grant awarded by the NPS Program, the agricultural conservation staff works with the farming community providing nutrient management planning, cost-share funding for agricultural best management practices, and partnering with the NRCS in developing conservation plans and Environmental Quality Incentive Program (EQIP) contracts. During 2007, the District planners made 1,771 contacts with farmers and landowners throughout Sussex County. Sussex County has a high concentration of poultry operations and the District is challenged with keeping our groundwater clean. The

District's client base is diverse with a large influx of Hispanics, Indians, and Asians to the area, with many raising poultry and proving to be excellent cooperators. The District also partners with DNREC providing important information about the conservation efforts throughout the county. Five of the staff members are funded through the Section 319 NPS Program grant and through base funding with the State of Delaware. Load reductions attributed to the SCD Planners are found in Appendix F.

2007 Highlights:

- In 2007, the SCD expended over $1.3 million in conservation cost-share funds. This included payments for cover crops, 4 poultry manure structures, 1 poultry composter, 1 animal waste system, 58 heavy use area protection pads, 5 poultry windbreaks, 5 vegetative shoreline stabilization projects, and 3 wildlife habitat ponds.
- The SCD provided information to the National Association of Conservation Districts at their request, about how the District works with Combined Animal Feeding Operations (CAFOs). The information was presented by President Olin Sims to the Senate Environment and Public Works Committee on September 6 along with other examples from other Districts throughout the country.
- Two SCD Conservation Planners assisted with an End of Season Stalk Nitrate Testing conducted by the Iowa Soybean Board and the University of Delaware. The data is still being analyzed and the results will be presented early in 2008.
- Two Conservation Planners participated in the Broadkill Pollution Control Strategy and Tributary Action Team meetings. The PCS is in its final stages of completion.
- One Conservation Planner assisted in the pollution assessment of the tributaries and ditches of the Broadkill Watershed.

Another program conducted in partnership with DNREC and the poultry integrators and dairy cooperatives is the Agricultural Nonpoint Source Revolving Loan Fund. This program helps poultry and dairy farmers finance their portion of conservation best management practices. Normally, cost-share will fund approximately 75% of the cost of the practice, and the farmer can finance the remaining balance at a low 3% rate. These payments are taken directly out of their flock or milk checks. Since the program's inception, over $5 million has been spent in Sussex County alone.

2007 Highlights:

- The State Revolving Loan fund assisted landowners in implementing BMPs. Over $240,000 in loans were processed in 2007 providing a low interest loan for the construction of certain conservation practices. SCD has adopted a uniform method of calculating administrative fees and are no longer having to rely on or wait for DNRECs Division of Water Resources to determine a billing rate.

Cover Crop - SCD Efforts

The SCD provides cost-share assistance to farmers to plant a winter cover crop. In 2006, the District paid $40 per acre for cover crop that was planted before October 1, and $30 an acre for cover crop that was planted before October 31. Farmers/Landowners can plant rye, wheat, barley, oats, annual rye grass, triticale, clover, vetch, or rape.

Farmers/Landowners are not allowed to apply commercial or animal fertilizer on a field that is intended to receive a cover crop incentive payment. Cover crop payments are divided up into two payments; half is made to the farmer after the crop has been planted, and the other half is paid after the crop has been destroyed.

SCD Cover Crop Sign

As part of a special pilot program beginning 2006, farmers/landowners were allowed to harvest their cover crop. All restrictions for the regular program still apply. The farmer/landowner harvesting the crop will not receive a second payment on that acreage, however, they will not be required to repay the first payment.

Planting a cover crop has a very positive impact on the environment. The crop takes up excess nutrients, improves ground water, and helps prevent soil erosion.

2007 Highlights:

- Cover Crop sign-up this year was the largest ever. The SCD enrolled over 87,000 acres requesting $1.3 million in cost-share assistance. Nearly 34,000 acres were planted which equals almost $971,000 in cost-share. Actual acres planted increased by 4,597 acres - a 15.6% increase over the acres planted in 2006. This year SCD implemented a new program by placing advertising signs in cover crop fields. The signs say *"Delaware Cover Crop Participant, Protecting our Bays and Environment"*. The signs are placed in fields along well traveled roads and have received a lot of positive feedback.

<u>Pre-sidedress Nitrogen Testing - SCD Efforts</u>

The SCD provides pre-side dress nitrogen tests to local farmers free of charge. This test helps estimate the available nitrogen in the soil for manured soils. The estimate is used to make a nitrogen recommendation to the farmer for a realistic yield goal for his/her corn crop. PSNTs take into consideration many factors in determining the need for additional nitrogen. Some of the variables include yield goal, type, rate, and timing of manure application, prior fertilizer application, tillage method on the farm, and irrigation. With all of these factors combined it allows the grower to see how much additional nitrogen is needed to produce the targeted yield. In 2007, the SCD completed 116 tests on 2,411 acres.

As well as PSNTs, the SCD also provides soil sampling to local farmers as an integral part of their nutrient management plan. Samples are taken every three years. The planners take 15 to 20 cores per sample and the samples are sent to the University of

Delaware Soils Lab. The results are reviewed with the farmer along with recommendations for nitrogen, phosphorus, potash, and lime. The recommendations are based on soil capability, use of animal manures, and a realistic yield goal for the crop. Soil sampling helps the farmer maintain his lime and nutrient levels which provides a more environmentally friendly method to farming.

2007 SCD Highlights:

- SCD Conservation Planners tested 116 fields using pre-sidedress nitrogen tests, covering 2,411 acres in Sussex County. They also completed 29 nutrient management plans on 4,997 acres and 33 animal waste management plans.

BMP's	District	EQIP	Total
Manure Shed	4	33	37
Composter	1	22	23
Poultry Windbreak	5	5	10
Ag Waste System	0	0	0
Irrigation System	0	9	9
HUAP	58	222	280
Poultry Litter Amendment	0	37	37
Rentars	2	0	2
Wildlife Ponds	3	2	5
Vegetative Shoreline	5	0	5

Activities	Total	Acres
Landowner Contacts	1426	
Conservation Plans	42	57938.4
Nutrient Management Plans	29	4997.0
Animal Waste Plans	111	
FY06 Cover Crop Enrolled	158	60314.6
FY06 Cover Crop Planted		29385.4
FY07 Cover Crop Enrolled	179	86878.0
FY07 Cover Crop Planted		33982.6
Soil Samples	308	5780.6
PSNT's	116	2410.6
Manure Samples	39	N/A

Dollars Expended		
District	EQIP	Cover Crop
$ 474,286.02	$3,866,170.00	$ 783,004.80

SCD Awards

The SCD won the Partnership Diversity Award through the National Association of Conservation Districts (NACD). This national award recognizes a conservation district that is addressing diversity needs to improve delivery of conservation programs. This award is sponsored by NRCS. The District received the award based on its excellence with employee diversity, program diversity, and efforts to improve and continue efforts to carry out conservation. The award was presented at the NACD National Meeting in Los Angeles, California on February 7, 2007.

William and Jill Davis of Millsboro were the recipients of the 2007 Cooperator of the Year Award and the Governors' Conservation Award. Mr. and Mrs. Davis signed up as beginning farmers through the Environmental Quality Incentive Program (EQIP) through NRCS to do various practices to improve the aesthetics and the quality of surface and ground water on the farm. They applied and were approved for a manure shed, a channel composter, six concrete pads, litter amendment and a poultry windbreak with micro-irrigation, as well as a comprehensive nutrient management plan. All of these practices have been installed with the exception of the windbreak. They raise 75,000 broilers for Allen's Poultry Company. Mr. and Mrs. Davis have also been approved for EQIP 2007 for a concrete pad in front of their manure structure. The Davis' did an outstanding job addressing a large number of resource concerns. They received the Governors' Conservation Award at the Soil and Water Stewardship Ceremony in April and they will receive the Cooperator of the Year Award at the SCD Cooperators' Dinner in December 2007.

The City of Millsboro was the recipient of the Governors' Conservation Award for the Urban Category. Similar to Sussex County, the Town of Millsboro has found their community expanding with commercial and residential communities. With that growth, the Town has formed an excellent working relationship with the SCD in making sure that developers and contractors are complying with their approved Sediment and Stormwater Plans. Over the last couple of years the partnership that has evolved with the Town and Conservation District has allowed not only the proper construction of stormwater facilities, but also, allowed us to collaborate on ideas and issues to better assist the Town and minimize impacts to our natural areas.

Outreach and Education - SCD Efforts

Every year, the SCD holds an event to honor those conservation minded individuals in the County. During odd years, SCD holds a dinner for their district cooperators. There have been as many as over 250 farmers, partners, and employees in attendance. During even years, a tax ditch breakfast is held which brings together the officers of the tax ditch organizations to discuss issues that are important to them. Well over 100 people attend this event also.

The SCD attends several events throughout the year to educate the public about conservation. Some of these events include the University of Delaware Coast Day, Delaware Solid Waste Authority Earth Day, and Autumn at Abbott's Mill. The District

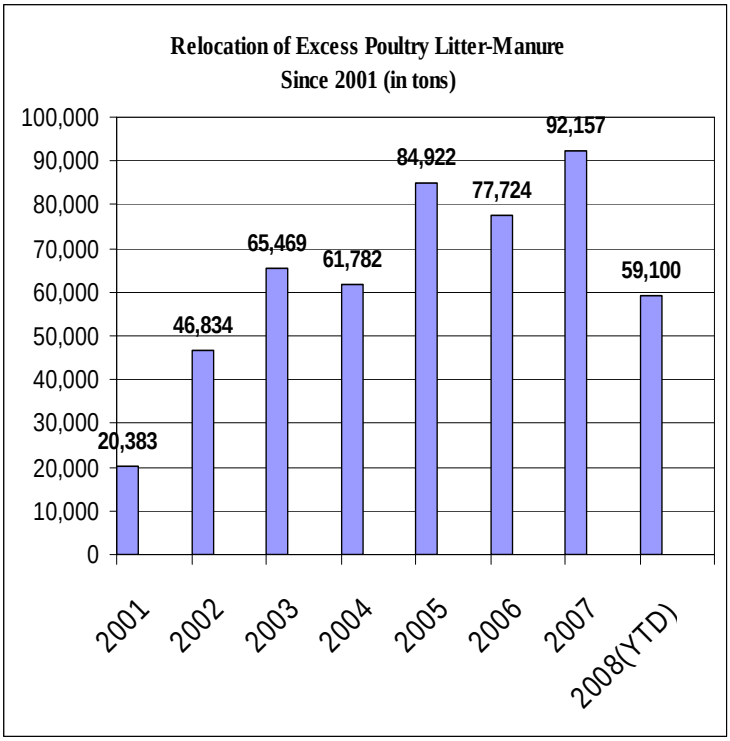
in cooperation with the conservation partnership also has a display at the Delaware State Fair. Information about the District and our programs are distributed at these events.

Each year the SCD staff assists with the Delaware Envirothon. The Envirothon provides student with an integrated approach to exploring five natural resource categories. It tests their creativity, analytical thinking, and team building skills in a competitive format. The Envirothon is a "day-in-the-field" where teams visit testing stations for problem solving opportunities in aquatic ecology, forestry, oral presentation, soil/land use, wildlife, and a current environmental issue. The 2007 Delaware Envirothon was held at the St. Jones Reserve in Kent County. Wilmington Charter Team A was the winner and went on to place ninth at the Cannon National Envirothon in Manitoba, Canada.

2007 Highlights:

- On December 6, the SCD held the biannual Cooperators' Dinner at the Bridgeville Fire Hall. The dinner was well attended with nearly 250 people in attendance. Krysta Harden, NACD CEO, was the guest speaker. The proceeds from the dinner, $1,245, were donated to the Delaware Envirothon.

Nutrient Management Relocation Program



Broiler production continues to be a vital industry on the Delmarva Peninsula. Delaware annually produces approximately 269 million broilers, ranking tenth in the nation among broiler production. Application of broiler litter to cropland in Delaware has been an important source of crop nutrients over the years, but has also contributed to elevated phosphorus levels in the soil.

Application of poultry litter to these farms is regulated by limiting phosphorus applications to the amount that can satisfy crop needs, creating a surplus of poultry litter on those farms which must be disposed of. Many farmers who demonstrate insufficient land or high soil phosphorous levels must find

alternative uses for poultry litter. Many businesses have surfaced over the past few years to help manage excess litter. The Relocation Program is an effective solution to excess litter generated in Delaware. The Relocation Program provides financial reimbursement to farmers, brokers, and trucking businesses for the transportation cost of relocating litter from a Delaware farm to an alternative use project or another farm for land application. The application process validates eligible senders, receivers, truckers, and alternative use projects. Excess litter continues to be transported for land application throughout Delaware as well as Maryland, New Jersey, and Virginia. Alternative use projects are also essential for managing excess poultry litter. In 2007, 92,157 tons of excess poultry litter were relocated, an eight year total of over a ½ million tons. Details are found in Appendix G. Over 50% of the excess litter goes to alternative use projects such as the Perdue AgriRecycle fertilizer plant in Blades DE. The plant processed a total of 60,340 tons in 2007, 32,140 tons being Delaware-generated. Also, Perdue AgriRecycle relocated 24,760 tons of raw poultry litter to landowners for crop production.

An active relocation project located at the Salem Farm in Farmington

Since the Program's inception, over 500,000 tons of poultry litter have been relocated, containing an estimated 28.5 million pounds of total nitrogen and 22 million pounds of phosphorus as phosphate. If that tonnage had been applied to the source farm rather than relocated, 1,982,922 pounds of nitrogen and 194,294 pounds of phosphorus would have potentially made their way to Delaware's surface waters. This represents a significant load reduction and a bargain from a cost-benefit analysis perspective.

Nutrient Management Planning

A nutrient management plan is a farmer's "business plan" for nutrients. The more efficient fertilizers are used on the farm, the fewer 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 NPS Program continues the partnership with Delaware's Nutrient Management Commission and Conservation districts in providing nutrient management plans to farmers. They depend on private and public nutrient consultants. In 2007, 184 farms, 1 school, and 3 golf courses representing 141,650 acres were reimbursed at a capped rate for a plan developed by a private consultant. Kent and Sussex Conservation Districts assisted 49 farms representing 11,944 acres in the development of nutrient management plans. Also, 47 farms were assisted with an animal waste management plan. During 2007,

a total of 153,594 acres were provided with nutrient management plans that are valid until 2010.

Delaware Environmental Stewardship Program

The NPS Program assisted in a Commission partnership with three poultry integrators to select and recognize the 2007 environmental stewards. Allen's Family Food Inc., Mountaire Farms Inc. and Perdue Farms, Inc. and Delaware Maryland Agri-Business Association funded the 2007 stewardship program. The Environmental Stewardship program was established in 2001 to recognize farmers whose stewardship and general farm practices contribute to the conservation of the environment, water quality and farmland. The program recognized growers by evaluating nutrient management, best management practices, farm management, innovation, biodiversity and wildlife management. The 2007 Delaware Environmental Stewardship was awarded to one poultry operation and one non-agricultural entity. Scott Peterman was awarded the 2007 environmental steward received a cash award of $1,000, a plaque and a lane sign. (***Left to right:*** *Harold "Jack" Peterman; Michael Scuse, Secretary of Agriculture, PaulDownes, Scott Peterman, Bill Rohrer, DDA Nutrient Management Program Administrator)*

The Delaware Nutrient Management Commission recognized DNREC as the non-agricultural environmental steward. DNREC has been a significant partner with the Commission in implementing nutrient management strategies. ***(Left to right****: Robert Baldwin, DNREC, Scott Peterman (back); John Hughes, DNREC Secretary, Michael Scuse, DDA Secretary, Carl Solberg, Nutrient Management Commissioner)*

Nutrient Management Coordinator

Using 319 funds, the NPS Program supports nutrient management in Delaware through a hired Nutrient Management Coordinator at the Delaware Department of Agriculture.

Nutrient Management Planning

The NPS Program partners and the Nutrient Management Commission depend on private and public nutrient consultants to develop nutrient management plans.

The primary emphasis of the Nutrient Management Coordinator is on program implementation, in order to facilitate planning priorities and to take a lead role in the coordination of the Nutrient Management Planning Reimbursement Program.

Responsibilities include, but are not limited to the following:

- Participate in outreach, education and marketing events to promote nutrient management planning;
- Assist in the financial management and analysis of the Nutrient Management Planning Reimbursement Program;
- Assist farmers, consultants and others in the overall integration of nutrient planning and other nutrient management related activities on the farm, by watershed, county and state;
- Assist farmers with the implementation of the nutrient management standards.

Nutrient Management Coordinator activities for 2007 include the following:

- Oversee a total of 153,594 acres that were provided with nutrient management planning in 2007
- Attended four Nutrient Management conferences
- Spoke to four community and professional groups
- Met with 50 farm owners/operators to offer technical assistance
- Conducted 31 Nutrient Management farm audits
- Represents the program at Source Water Protection CTAC (Citizens Tech. Advisory Committee) meetings
- Represented the Program at the Delaware State Fair
- Managed the 2007 outdoor stockpile survey. Identified and achieved compliance for 73 farms with outdoor manure storage challenges
- Assisted in writing quarterly information pamphlet
- Oversaw approval and payment of cost share monies for 141,650 acres of nutrient management planning. Kent and Sussex Conservation Districts assisted farms representing 11,944 acres in the development of nutrient management plans, and/or animal waste management plans.

- Assisted in investigation and resolution of two formal nutrient management complaints
- Represented the program during 11 EPA inspections on farms in Delaware

The Delaware Nutrient Management Survey

In the summer of 2007, the Nonpoint Source Program conducted a survey on behalf of the Delaware Conservation Partnership to assess the attitudes and progress of farmers concerning the implementation of Delaware's Nutrient Management Program. The purpose of the survey was to help improve the ability of Delaware Conservation Agencies to tailor their cost-share programs, educational efforts, and nutrient management plans to the needs of Delaware farmers. Over 450,000 acres of Delaware cropland have met the nutrient management planning requirements since the Nutrient Management Law was enacted in 1999. This past January marked the final of five legal deadlines, so that nearly all producers in the state who are required to have a nutrient management plan have been through the nutrient management planning process at least once. The NPS Program worked with the DE Department of Agriculture and the Cooperative Extension to provide a continuing education credit toward nutrient management recertification for all landowners who participated in the survey.

Summary of Results

Nutrient management is not a new practice to most Delaware farmers. Prior to the Delaware Nutrient Management Law, many landowners were already in the habit of taking soil tests and following soil test recommendations. However, over the past several decades, local waters have become more polluted, due in large part to an excess of nitrogen and phosphorus. In recent years, increasing pressure has been placed on the agricultural community to refine nutrient practices further.

Agriculture makes up about 42% of the land area in Delaware, and so reductions made in nutrients that are applied to farmland are vital in reducing the amount of nitrogen and phosphorus that make their way into our streams, rivers and estuaries. Nutrient management planning serves two important functions. First, it helps to promote an awareness of the “nutrient balance” on a farm- a comparison of all the nutrient sources on a farm with the crops’ nutrient needs. Knowing if excess nutrients exist, and providing means and incentives to dispose of those nutrients (if necessary) are key components to avoid nutrient pollution. Second, nutrient management plans demonstrate the efforts that the agricultural community makes toward being good stewards of the environment.

Why a Nutrient Management Survey?

Nutrient management is an important tool for reducing nutrient pollution and improving water quality. The Delaware Nutrient Management Survey was conducted with one basic principle in mind: if nutrient management works for farmers, then it will work for the

environment. The intent of the survey was to assess: Are the plans flexible enough? Are they easy to understand? What are the main challenges in implementing the plans? Only farmers can answer these questions definitively.

How will the results of the survey be used?

The answers to the survey are helping public agencies focus their efforts on removing barriers to implementation and making the nutrient management plans more useful. For example, if many respondents had indicated that their plans were not easy to understand, then nutrient management consultants would know to focus efforts on making plans easier to use. If a number of people requested more information on managing nutrients on hay and pasture fields, then Cooperative Extension may develop continuing education sessions on that topic. The survey may also be used to help evaluate potential programs to see if they would effectively address the needs of Delaware's farmers.

Who answered the survey?

The surveys were sent out to everyone who has been certified by the Nutrient Management Program- 2,034 people in all. The Delaware Conservation Partnership received 698 responses- about a 34% response rate. The following table shows the breakdown of responses among different sizes of farms.

Responses by Farm Size	
1-10 Acres	9%
11-99 Acres	29%
100-499 Acres	25%
500+ Acres	20%
Animals Only	10%

How do farmers rate the quality of their plans?

One of the main purposes of the survey was to examine the quality of the plans. Respondents were asked about several different attributes of the plan, each affecting how beneficial the plan is to the farmer. If the plan lacks any of these attributes, then it would not be useful and would serve as a burden rather than a management tool. Here are the statements that the respondents rated, along with the percentage of farmers who agree with the statement:

	% Agree
My nutrient management plan is **flexible.**	**55%**
My plan is **easy to understand.**	**67%**
My plan helps me to **understand how much manure is generated** on my farm and how much, if any, is excess.	**64%**
The recommendations in my plan are **realistic**.	**66%**
I receive **adequate technical assistance** during the implementation of my plan.	**69%**
Nutrient management provides an **economic benefit** to my operation.	**49%**

These responses varied only slightly among different farm sizes and types, with the exception of whether or not nutrient management provided an economic benefit to their farm. Larger farms and those whose plans were written by a private consultant were most likely to agree that nutrient management provides an economic benefit to their operation. Small farms, animal operations and those whose plan was written by someone on staff were least likely to agree.

What are the challenges?

"Difficulties associated with weather" was the highest ranked challenge, followed by "Timing of Applications isn't practical" (15%) and "The plan won't protect profits" (13%).

What do farmers consider most when trying a new practice?

The four top considerations for trying a new practice overall were "Cost versus Profit" (63%), "Track Record of Practice" (34%), "Testimony of Other Farmers" and "Availability of Information" (both at 31%).

Smaller farmers ranked "Time Investment" among their top considerations, while large farmers ranked "Risk of Yield Loss" among theirs.

Where do farmers learn about new practices?

"Nutrient Management Training" (67%) ranked the highest, followed by "Cooperative Extension" (55%) and "Other Farmers" (44%). One place farmers definitely do not go for information is the Internet- at 10%, it scored the lowest among almost every group.

Who writes the plans?

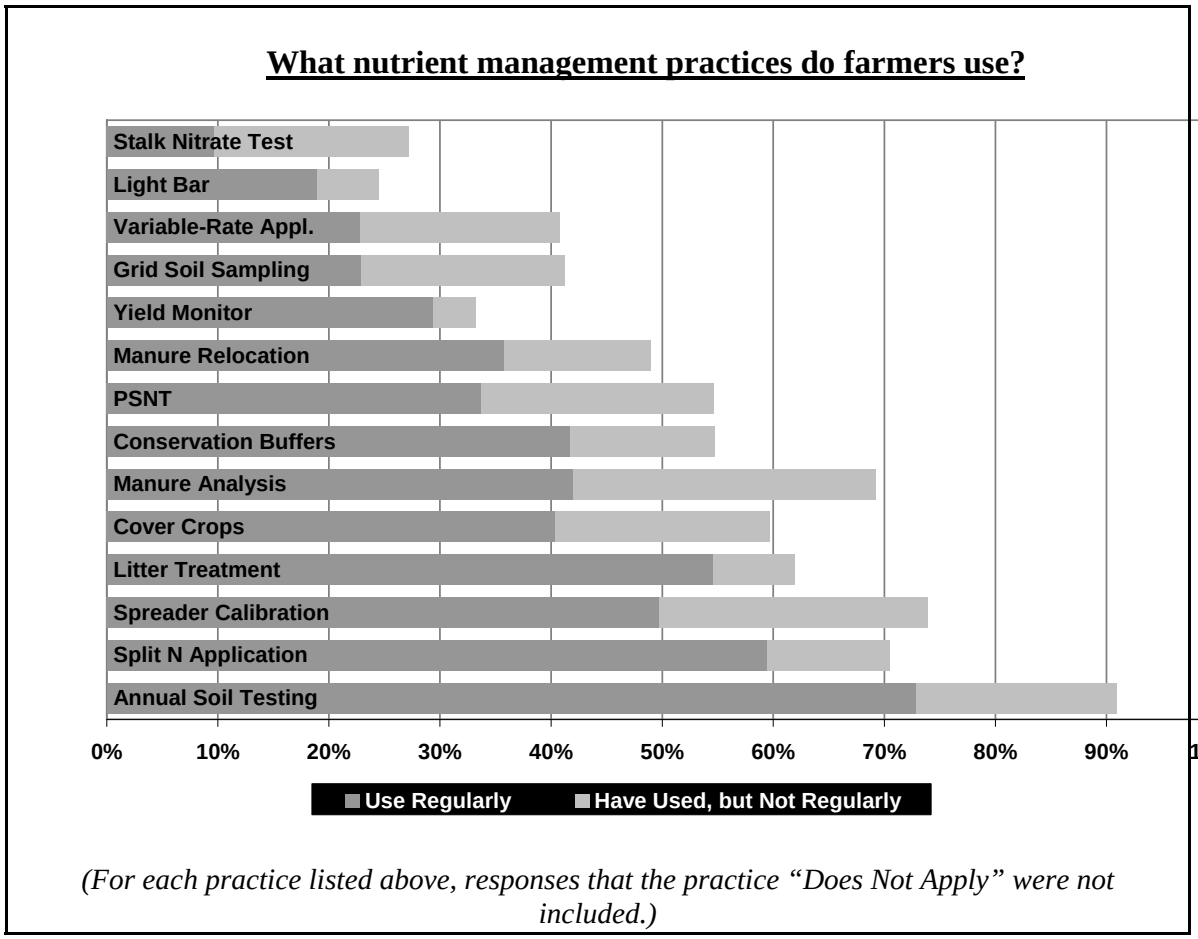
Among all of the responses to the survey, 41% worked with a private consultant, 35% worked with a public consultant to write their plan and 15% wrote their own plan. (Some of the respondents did not answer all of the questions.)

The larger a farm is, the more likely the farmer is to work with a private consultant. For farms that are 500 or more acres in size, only 15% of the plans are written by a public consultant, while 82% were written by someone in the private sector.

Have farmers reduced their fertilizer and manure applications?

Farmers say that they have. Fertilizer application rates have decreased the most among farmers who till at least 500 acres, while manure applications have decreased most among farmers who till between 11 and 99 acres. The following table shows the average decreases, weighed by the amount of acreage that each farm size category makes up in Delaware.

	% Reduction
Fertilizer N	12.6%
Fertilizer P	23.1%
Manure	10.4%



This is a first look at the results of the Nutrient Management Survey. Over the next year, members of the Delaware Conservation Partnership will examine the results of the survey in greater detail, including specific suggestions, in order to identify ways to better enable nutrient management planning in Delaware.

State Revolving Fund Loan Program

The State Revolving Fund (SRF) Loan program provides Delaware poultry and dairy farmers a way to benefit from a 3% loan while encouraging them to install best management practices (BMPs) that will reduce NPS pollution, on their farms.

Since the inception of the program loans have totaled $ 6 million for poultry and $900,739 for dairy producers.

The following is a breakdown of BMPs that producers received SRF funding for in 2007:

Poultry BMPs	***#***	***Amount***
Manure Structures	19	$ 238,416
Poultry Carcass Composters	14	$ 30,789
Dead bird incinerators	0	0
Front-end loaders	5	$ 62,400
Calibratable spinner manure spreaders	0	0
Heavy use area protection pads	47	$ 86,267
Dairy BMPs		
Dairy Waste Management System	1	$ 26,255

Eligible practices for poultry loans include:

- Manure storage structures
- Poultry carcass composters
- Dead bird incinerators (with permit)
- Front-end loaders and bucket attachments to facilitate dead bird composting
- Calibratable spinner manure spreaders
- Heavy use area protection pads

Eligible practices for dairy loans include:

- Dairy waste management systems
- Liquid manure application, transfer, and agitating equipment
- Front-end loaders
- Manure spreaders
- Irrigation equipment for spray irrigating wastes

New BMP for Poultry Producers

A Poultry Windbreak is a new BMP that has been approved by EPA to be eligible to receive SRF funding. This practice will allow poultry produces to demonstrate their continued commitment to voluntarily implement a program to be a good neighbor and environmental steward. An important aspect of a poultry windbreak is the trees ability to filter odor, dust, feathers, and noise emitted from poultry operations. In addition, to the leaves' ability to capture various gases, the roots of trees

are effective in absorbing nutrients that might escape the proximity of the poultry farm. Trees aid in filtering nutrients in the runoff of groundwater. A growing windbreak can take up 200-300 pounds of nitrogen per acre per year from ground water.

Urban and Community Forestry Tree Planting Program

The Delaware Forest Service (DFS) Urban & Community Forestry (U&CF) Program received NPS funding to supplement its annual non-industrial private landowner assistance programs and the community forestry grant program to enhance the state's water quality and diverse forest resources.

Existing riparian buffers, along with adjoining uplands, were planted in private urban/suburban public owned areas throughout the state. These projects improve water quality by establishing and improving forested buffers in riparian areas, utilizing trees and forested stands to manage storm water, stabilizing stream banks and waterways, and reducing sediment and nutrient loading to impaired waterways. Similar projects were funded in FY02 and FY03 for both rural and urban/suburban areas and only urban forestry activities were funded for FY04, FY05 and FY06. For FY07, the DFS again funded only the urban/community forestry activities.

The DFS reviewed the project applications and awarded funds to projects of merit with special consideration given to watersheds identified with TMDL pollution loading concerns. The U&CF Grant Program utilized funds to establish trees on publicly owned lands within communities as part of a long-term comprehensive forest management plan with an objective of not only establishing immediate plantings, but eventually expanding forested areas and connecting existing ones. Recipients provided 50 percent funding for the projects, or in the case of some communities, provided 50 percent in-kind match for establishing the planting projects. The DFS then reimbursed the landowners and communities based on the actual cost of the trees and the planting.

The DFS U&CF Program recognizes the importance of trees within Delaware's communities. Efforts to plant trees throughout the state result in the following benefits:

- ***A reduction of water run-off***. Trees can reduce the impact of a storm event resulting in less run-off and erosion. This allows for recharge of natural water supplies and decreases the amount of impervious service within a community. In addition, trees & wooded areas lessen the movement of sediments, nutrients, and chemicals into the regions water resources.

  Studies have shown that riparian forest buffers significantly reduce the delivery of nitrogen, phosphorus, and sediment to surface waters, capture energy from rainfall events, and provide thermoregulation of water bodies. In comparison to other types

of vegetative buffers, forested buffers remain effective for extended periods of time with little to no maintenance.

It is anticipated that the establishment of forested areas will result in denitrification rates of potentially 50 pounds per acre, per year. Additionally, delivery of sediment and phosphorus to adjacent watercourses could potentially be reduced by 70 percent as a result of these projects.

- ***A measurable increase in the number of trees found within an identified community.*** Many of Delaware's newly formed sub-divisions are void of trees. By replanting forest resources in the community, property values will increase and the quality of life will be improved for Delaware residents.

- ***A reduction in community energy costs.*** By planting properly placed trees around a home or building, air conditioning needs can be reduced by 30 percent and can reduce heating costs by nearly 50 percent.

- ***Re-establish wildlife habitat and biodiversity.*** The planting of trees can reduce the number of trees lost annually to development within the state. The creation of this new habitat will increase plant and wildlife diversity.

- ***Reduction in air pollutants.*** Trees can improve air quality by trapping dust particles that can be harmful to the state's population. One acre of trees can provide oxygen for 18 people and absorb the amount of carbon dioxide each year equivalent to that produced by a car driven 26,000 miles.

2007 Highlights

Below is a summary for 2007 319 Non-Point Source Pollution Program allocation of the U&CF Program managed by the Delaware Forest Service. To date DFS has spent $32,638 of the $50,000 grant award for tree planting. Several other projects are pending to account for the remaining $17,362. It is anticipated that the remaining funds will be spent by the end of April 2008.

Community Name	**Watersheds**	**#Trees**	**Award**	**Amount Spent**
Bay Pointe Maint. Corporation	C&D Canal	58	$5,000	$5,000
Town of Dagsboro	Inland Bays	50	$5,000	
City of Delaware City	C&D Canal	23	$2,638	
Hunters Run- CIB	Inland Bays	32	$5,000	$5,000
Woods at Seaside	Inland Bays	40	$5,000	$5,000
City of Milford- Goad Island	Mispillion River	40	$5,000	$5,000
Brennan Estates Maint. Corp	C&D Canal	41	$5,000	$5,000
TOTAL		**284**	**$32,638**	**$25,000**

Urban BMPs

Characterization and Analysis of Parking Lot Residue Using Wet Vacuum Street Sweeper, Rehoboth Beach, Delaware

Numerous studies have demonstrated the effectiveness of using wet-vacuum street sweeping units at removing fine sediments from parking lots and roadways. With funding from the NPS Program, DNREC's Sediment and Stormwater Section conducted a study to examine the contents collected from a wet-vacuum street sweeper from two sites located in Rehoboth Beach, Delaware.

The two selected sites, Site A (5.1 Ac) and Site B (5.6 Ac), are located in the Inland Bays Watershed of Delaware. The sites were selected based on location and parking lot size. The two sites were out of 27 that were originally investigated based on the following criteria:

- Sites not currently sweeping parking lots
- Sites without properly functioning best management practices in place
- Sites with willing property owners

Schwartz is a company well-known for producing environmentally efficient wet-vacuum trucks specializing in roadway and highway cleaning. From November 2006 through December 2007, a Schwartz S 347 LITE vacuum model (3 cubic yard hopper), swept sites A and B twice a week using a spray bar mechanism. The S & S Section representatives collected samples from the hopper, monthly, from December 2006 through December 2007 on the following dates: December 11, January 19; February 13; March 13; April 23; May 31; June 11; July 30; August 27; September 17; October 9; November 28; and December 17.

Subsamples were taken using a strategic method, and sieve analyses were performed on the samples of the following sieve sizes: 25mm, #5, #10, #60, and #230 sieves. Each sieve size was weighed in grams and then an approximate volume was calculated.

A grab sample for chemical analysis was placed into a laboratory bottle prior to the sieve analysis and taken to Atlantic Coast Laboratories for analysis. The following parameters were tested: chloride; copper; nitrate; petroleum hydrocarbon; phosphorus; sodium; kjeldahl nitrogen; total nitrogen; zinc; and pH.

The study team is currently analyzing results of this study, with a final report anticipated to be available by June, 2008.

Wetland Restoration Projects 2007

The NPS Program provided funding to DNRECs Draining Section to conduct wetland restoration projects throughout Delaware. The following gives a brief summary of each project funded. The pictures shown were taken during and after construction.

Marlene Sommers Wetland Restoration Project

The Sommers Wetland Restoration Project is located at the intersection of Route 6 and Gravesend Road, located east of Smyrna, Delaware. The project involved the conversion of a portion of an agricultural field into a 2 acre wetland restoration site. The newly created wetland complex now intercepts and filters runoff from the remaining six acres of agricultural field.

Solberg Wetland/Stream Creation and Restoration Project

The Carl Solberg stream and wetland restoration project has been completed in a cooperative effort between the Department's Ecological Restoration Team and the Kent Conservation District. The project involved 1,700 feet of stream restoration (which was previously a prong of the Marydel Tax Ditch), elevating the ditch bottom, installing three water-control structures (one created to replicate a beaver dam) and creating 2 acres of floodplain wetlands adjacent to the original channel. Tom Barthelmeh performed construction oversight; John Wayne Lucks (Kent Conservation District) served as the equipment operator. This is a very unique project in that the entire tax ditch right-of-way has been eliminated and portions of the tax ditch maintenance access-way have been restored to wetlands. It should also be noted that the landowner purchased additional lands along the tax ditch so that the project could be completed.

Also a wetland planting day was held on May 8, 2007 with over 30 volunteers from various agencies participating (Kent Conservation District, Kent County Parks and Recreation, Division of Soil and Water Conservation (Drainage and Stormwater Program) (Non-Point Source Program), and Carl Solberg) in the planting of native trees, shrubs, and grasses. Mr. Solberg is very pleased with the outcome of this project. This project is located in western Kent County and is part of the Chesapeake Bay drainage basin.

Gerald Harman Wetland Restoration Project

The Harman Wetland Restoration Project is located off of Route 8 west of Dover, Delaware. The project involved the creation of a three acre wetland complex within a marginal agricultural field. The project was planted with over 150 native trees, shrubs and grasses by a local Boy Scout Troup.

Polytech Wetland Creation/Demonstration Project

The Division of Soil and Water Conservation, Polytech High School, and the Kent Conservation District, completed the construction of a 0.35 acre wetland complex at Polytech High School. The project area is located east of the town of Woodside, Kent County, Delaware and is within of the Delaware Bay watershed. The wetland project involved enhancing a shallow water pond constructed 3-4 years ago and the conversion of open field into a diverse wetland system. The shallow water pond was enhanced with microtopography features and the addition of organic matter and coarse woody debris. Students plan to plant the wetland system with native vegetation in the future including trees, shrubs, and grasses. As a result of this project, surface water runoff from adjacent athletic fields is first filtered through the new wetland complex and then filtered through the enhanced wetland system before making its way to adjacent forest. Polytech High School Environmental Science Program is currently utilizing the site as an outdoor classroom, advancing the students knowledge of wetland ecology.

Duke Jobs Tax Ditch

The Division of Soil and Water, Duke Jobs Tax Ditch, and Sussex Conservation District developed a demonstration project illustrating an environmentally friendly approach to

Tax Ditch maintenance. This project included reclaiming 5,900 linear feet of maintenance access way along Prong 1 of the Duke Jobs Tax Ditch. Maintenance on this portion of the Tax Ditch has not taken place since original construction due to insufficient funds. Trees growing within the maintenance roadway were selectively removed using bulldozers, excavators, and hand clearing. Trees to be removed located along the top of the ditch bank and slopes were flush cut to maintain soil stability. Larger trees with the most ecological value remained to retain wildlife habitat and preserve forest canopy. Trees were carefully selected to allow sufficient space for future maintenance dip-out of the Tax Ditch. This method of tax ditch maintenance is very unique and supports DNREC's initiative to perform maintenance activities in a less disturbing fashion.

Mike Remus Wetland Restoration Site

The Remus Wetland Restoration Project is located immediately adjacent to the previously mentioned Polytech Wetland Project, situated east of the town of Woodside, Kent County, Delaware. The project involved the conversion of one acre of marginal agricultural field into a 1/3 acre wetland restoration site. The remaining portion of the field will be planted in warm season grasses. In addition, Mr. Remus has agreed to allow Polytech High School Environmental Science Program to utilize the site as an outdoor classroom.

Heron Drain Tax Ditch Stream and Wetland Restoration Project

The Heron Drain Tax Ditch Stream and Wetland Restoration Project is located along Berrytown Road, west of Woodside, Delaware. The project involved the construction of a one acre wetland adjacent to Prong 4 of the Heron Drain Tax Ditch. The construction effort involved redirecting water flow from Prong 4 (Approximately 250 Acre Watershed) into a series of constructed wetland pools connected by a chain of channels.

The overall goal of the project is to establish a treatment system located within a Tax Ditch watershed, which supports DNREC initiatives to reduce nutrients and sediments from our ditch systems before reaching downstream estuaries.

Other related restoration activities complete by the Drainage Section are listed below. These projects have been performed using other state, local, and federal funding and support NPS pollution reduction throughout the state.

Brown Farm Stream/Wetland Restoration Project

The Brown Farm Stream/Wetland Restoration Project involved the reshaping of a private ditch (Approximately 500 linear feet) in order to allow it to function as a natural floodplain/stream system. The project involved widening the channel from 10 feet to approximately 35 feet in a meandering arrangement while maintaining a low flow channel. This system provides a hydrologic outlet for a 2 acre restored wetland ecosystem constructed in July 2005 utilizing the EPA's Wetland Projection Program Grant. This is not uncommon for our projects to incorporate many partners to maximize environmental benefits.

DNERR Coastal Decision Maker Workshop (Wetland Restoration Construction Techniques Interactive Training Seminar)

On April 4, 2007, the Division of Soil and Water Conservation, Delaware National Estuarine Research Reserve hosted a Coastal Decision Maker Workshop entitled "Wetland Restoration Construction Techniques" presented by Tom Barthelmeh (Div. of Soil and Water Conservation), Al Rizzo (U.S. Fish & Wildlife Service), and Virgil Holmes (private landowner). This interactive, 3-hour training seminar on wetland restoration construction techniques focused on numerous aspects of restoration ranging from landowner contacts, planning and project agreements to various on ground construction techniques including the establishment of micro-topography and the introduction of organic matter and coarse woody debris. Following a 1.5-hour presentation, the participants were asked to apply what they learned in the "classroom setting" by constructing a model of a wetland/ stream complex within an agricultural parcel. They simulated a model farm and ecosystem utilizing a three foot by four foot sandbox. All the material necessary to construct a wetland complex (e.g., soil, clay, woody debris, organic matter, construction equipment, etc.) was provided. Participants had to utilize Best Management Practices to ensure that pastures, crop fields and livestock areas drained into wetlands via structures, streams, and ditches. Approximately

30 people representing various organizations including the Natural Resources Conservation Service, Kent Conservation District, Sussex Conservation District, DNREC – Division of Water Resources, DNREC – Division of Fish and Wildlife, DNREC – Division of Soil and Water Conservation, Indian River School District, private property owners, and one professor and four students from the University of Delaware participated in the workshop.

Wetlands and Watershed Workshop in Ocean City, Maryland

The "Wetland Restoration and Construction Techniques Course" was also conducted as part of the Tenth Annual Wetlands and Watershed Workshop in Ocean City, Maryland which was sponsored by the U.S. Environmental Protection Agency. On October 23, 2007, the training workshop was lead by Tom Barthelmeh, Al Rizzo (U.S. Fish & Wildlife Service), and Matthew Grabowski. Approximately 40 people representing various organizations throughout the United States participated in the activity. The feedback from the participants was very positive.

Indian River High School Sandbox Workshop

Pat Cicala, science teacher at Indian River High School attended The Wetland Restoration and Construction Techniques workshop held on April 4, 2007. Mr. Cicala was very impressed with the workshop and followed up by having his Environmental Science class replicate the workshop.

The following is a news article featured in the school paper. News article on Indian River site: *"Environmental Science Students Create Wetlands in IR Backyard"*

Eleventh grade students in Mr. Cicala's Environmental Science classes will take what they have learned in the classroom and apply it to the real world. In conjunction with Mr. Tom Barthelmeh from the Department of Natural Resources and Environmental Control, Mr. Cicala proposed a possible Wetland Study Area on the grounds of IRHS. As a final

project students will work in small groups to apply wetland restoration information presented in class to design a wetland area on campus.

Using an aerial photograph of the IR grounds, groups will trace possible areas for dredging, berming, planting, and usage of water control devices to make a viable wetland area then scale the map to size. Proposals will include placement of control devices, slope of drainage areas, collection points, culverts, planting for soil retention, vegetation types, and walk ways, or paths for student access. Groups will build a scale model then present their proposals to the class. Final proposals for all classes will be voted on for submission to the State of Delaware for approval.

Education and Outreach

The Drainage Section has a display featuring wetland and stream restoration activities. This display has been present at many functions throughout the state including the Delaware State Fair, Delaware State University Agriculture Conference, and Sussex Conservation District Cooperators Dinner. Complimenting that effort a presentation was made by Tom Barthelmeh to the Chesapeake Bay Tributary Action Team on April 19th, 2007 focusing on Tax Ditch best management practices and wetland/stream restoration. Follow up to that Mr. Barthelmeh lead the team in a tour of recent restoration projects within the Chesapeake Bay watershed (many of which utilized NPS funding).

Beginning Steps – U of D Newark Farm Wetland Site

The University of Delaware's College of Agriculture and Natural Resources entered into a Project Agreement with DNREC on January 4, 2007 to perform ecological restoration work at the University of Delaware - Newark Farm. On-site utilities were marked and surveyed in late April 2007. On September 26, 2007, Softdig, an underground utility locating service, provided services to determine exact depths of water and gas lines throughout the farm complex.

On October 15, 2007, Jenny McDermott of the University of Delaware was contacted and it was determined that the wetland near the Girl Scout office was ready for construction. Tom Barthelmeh, responsible for scheduling the equipment crew was notified on October

16th that this site was ready for construction and a request was made to schedule the Kent Conservation District equipment crew.

Stream Restoration Projects 2007

Perkins Run Stream Restoration Project

Introduction

The intent of this project was to combine the elements of stream and riparian buffer restoration techniques proven by others to develop a natural, fully functional stream corridor system.

New Castle Conservation District identified a defined reach of Perkins Run as a stream corridor restoration site. The stream reach, located downstream of Philadelphia Pike in New Castle County, Delaware, consists of 1,500 feet of the lower reach of Perkins Run that runs through the rear yards of a residential housing development and a county park in Northern New Castle County, Delaware. In this reach, Perkins Run was straight and significantly incised most likely as a result of relocation and channelization during construction of the surrounding residential community, and increased flood flows. This reach was selected due to its location at the lower end of the stream just upstream of tidal influence.

In this reach, the incised channel was restored to natural and stable step pool channel using a series of structures. In addition, a small floodplain was re-established to convey greater than bankfull flows.

The Perkins Run project is considered part of a larger water quality strategy to improve water quality in the Perkins Run watershed and streams throughout the State of Delaware. Studies performed by DNREC (DNREC 1992, *"1992 Delaware Water Quality Inventory 305(b) Report"*) has shown that the impaired biological condition in this stream was associated with nitrogen, phosphorus and dissolved oxygen levels as well as physical habitat impairment. Watershed studies performed by the New Castle Conservation District in the late 1990's confirmed these findings.

The proposed stream corridor restoration was designed to address the problems identified in these studies by:

- restoring the physical habitat to a natural and stable (no degradation or aggradation) condition using fluvial geomorphic design techniques (establishment of riffles that

provide aeration and spawning habitat, pools and snags that provide protective cover and feeding habitat); and,

- establishing riparian buffers to provide additional water quality improvements through the removal of nutrients either through plant uptake or biological activities in the soil, placement of a physical barrier between the stream and potential water quality concerns, and shading of the stream to reduce thermal impacts.

Objectives Completed

Given the need for drainage in the state to support existing land uses and considering the negative environmental impacts associated with ditching, the challenge for responsible parties is to provide for the efficient removal of flood waters during storm events, while at the same time maintaining and/or restoring functional stream corridor systems. Accordingly, this project has met multiple objectives:

- Re-establishment of biological diversity through the development of:
  - in-stream aquatic habitat;
  - wooded and emergent wetlands in the floodplain adjacent to the stream;
  - where applicable, wetlands on adjacent terraces; and
  - riparian corridors consisting of native species.

- The reduction of surface water pollutants entering the stream through the re-establishment of vegetated riparian corridors that:
  - trap sediments and the other pollutants that are bound to them;
  - enhance infiltration to improve uptake of nutrients and other pollutants in root systems; and
  - promote de-nitrification and the degradation of other pollutants through biological processes.

Monitoring of channel stability and the biological community is a component of this project. Biologists and engineering have performed pre and post-restoration channel stability evaluations.

<u>Beginning Steps - Fairway Falls Stream Restoration Project</u>

Legislative Assistant Janet Kilpatrick contacted Steve Williams and Larry Irelan (New Castle Conservation District (NCCD)) and requested an update concerning the availability of funds for the Fairway Falls stream restoration project (tributary to Pike Creek). Mr. Williams informed Ms. Kilpatrick that some funds ($45,000) are secured for this project through the CWA Section 319 EPA Nonpoint Source Grant that was recently

awarded to the Division of Soil and Water Conservation. Mr. Irelan also indicated that some 21st Century Funds were also available. On October 9, 2007, a meeting was held with Janet Kilpatrick, Larry Irelan, Chuck Lightfoot, Steve Williams, Dave Twing and Bruce Jones with Green Stone Engineering. The group evaluated the preliminary field work done by Green Stone and identified the next steps in order to move the project forward (e.g., property access agreements, involvement from New Castle County, easements, site access, etc.). Mr. Irelan agreed to initiate discussions with New Castle County concerning long-term maintenance of the project and other related issues.

Vegetative Shoreline Stabilization Cost-Share Projects

The NPS Program provided funding to DNRECs Subaqueous Lands Section to provide vegetative shoreline stabilization cost-share to residents in the Inland Bays and Nanticoke River Watersheds. The funding was administered by the SCD.

Although rip-rap and bulkheads are effective and often necessary along exposed, "high-energy" shorelines, many more protected areas exist which are good candidates for the use of vegetative shoreline stabilization techniques. Such techniques preserve the natural shoreline and critical, shallow-water, near-shore habitat, as well as prevent the introduction into the marine environment of the toxic wood preservatives typically used on bulkheads.

For many shorelines along the moderate to low energy areas of Delaware's bays and tributaries, the creation of these fringing marshes is an effective, less expensive option for the control of shoreline erosion. These marshes:

- act as a buffer from wave energy to protect property by lessening the effects of erosion,
- reduce the amount of pollutants entering the water by filtering upland runoff and trapping sediment and nutrients,
- enhance the fisheries and near-shore habitat value of an area,
- increase the organic exchange which forms the basis of the food web, and
- present a natural, attractive view from both land and water.

Typically, somewhere between 2 and 4 miles of Delaware's shorelines are stabilized each year, using a variety of techniques through a variety of Programs. The proportion being stabilized with environmentally friendly vegetative stabilization techniques has been slowly rising, from just a few percent in 1994, to nearly 50 percent in 2006.

Previous funding of this program allowed the Department to convince 18 property owners, who would not otherwise have used vegetation, to do so. Those 18 projects represented a total of 3,223 linear feet of shoreline protected, and a quarter of an acre of important near-shore habitat created, in projects ranging from as little as 35 linear feet to 500 linear feet. That represents an increase of nearly 43% over the average number of linear feet stabilized with vegetation in a typical year before the cost-share program.

We also estimate that approximately 8,500 lbs of sediment are precluded from entering Delaware's waterways each year as a result of constructing these 18 projects.

The existing program was limited to projects within Sussex County and was carried out with cooperation between the Department's Nonpoint Source Program, Wetlands and Sub-Aqueous Lands Section, and the Sussex Conservation District. Beginning in 2005, the project was expanded to include the Inland Bays, Nanticoke, Murderkill, and Appoquinimink watersheds.

During this period, six new vegetative stabilization projects were approved. Combined, the projects will result in stabilizing more than 400 linear feet of shoreline funding through the NPS Program. Four of the projects are in the Inland Bays watershed. One of these projects involves stabilizing a substandard rip-rap revetment by planting smooth cordgrass (*Spartina alterniflora*) in front and at the toe of the old revetment. The other two projects are in the Nanticoke watershed. Most of the FY 05 funds have been spent or set aside for approved projects. There may be a few of these projects that are not going to use the money (Note: Most of the approved projects have a 3 year construction deadline built into their permits) and these will be identified for the forthcoming annual report. Any money that is not being used for previously approved FY 05/06 projects will be redistributed into other projects. A short summary of the new projects along with their locations including latitude/longitude coordinate locations is as follows:

- **Angelo Maggi** – 17 Schooner Village, Bethany Beach, DE – 20 linear feet of coir log with wetland vegetation plantings along the Salt Pond and including *Phragmites* control. Project complete. Lat. 38º 32' 59.38" N, Long. 75º 4' 11.04" W

- **Alex Chambers** – 15 Jeremy's Branch, Schooner Village, Bethany Beach, DE - 20 linear feet of coir log with wetland vegetation plantings along the Salt Pond and including *Phragmites* control. Project complete. Lat. 38º 32' 59.12" N, Long. 75º 4' 11.56" W

- **James Geer** – 16 Jeremy's Branch, Schooner Village, Bethany Beach, DE - 20 linear feet of coir log with wetland vegetation plantings along the Salt Pond and including *Phragmites* control. Project complete. Lat. 38º 32' 59.22" N, Long. 75º 4' 11.32" W

- **Tom Johnson** – 117 Pine Cove Drive, Seaford, DE – 100 linear feet (200 sq. ft.) of freshwater wetland plantings including Blue Flag and Soft Rush in Williams Pond. Project complete. Lat. 38º 38' 50.01" N, Long. 75º 35' 47.74" W

- **Beverly McWilliams** – 26753 Canal Lane, Seaford, DE – 100 linear feet (300 sq. ft.) of freshwater wetland plantings including Blue Flag and Soft Rush with a rock toe in the Nanticoke River. Project complete. 38º 37' 16.75" N, Long. 75º 37' 32.45" W

- **Robert and Mary Ellen Williams** – 432 Canal Way East, The Salt Pond, Bethany Beach, DE – 133 linear feet (665 sq. ft.) of *Spartina alterniflora* vegetative stabilization in the Salt Pond. Project partially complete. Should be finished in 2008. Lat. 38º 32' 46.77" N, Long. 75º 4' 18.42" W

Watershed Plans & Project Implementation

An Overview of the Broadkill River Watershed.

Broadkill and St. Jones River Watershed Plans & Implementation Projects

In February of 2006, a Request for Qualifications was advertised by the Department of Natural Resources and Environmental Control (DNREC), Watershed Assessment Section for the solicitation of parties interested in writing comprehensive watershed plans for the Broadkill and St. Jones River watersheds. As part of the comprehensive watershed plan, the A through I criteria, as set forth by EPA, had to be addressed.

In May of 2007, Duffield and Associates (Duffield) was awarded the bid to write the watershed plans. At the request of DNREC the Center for Watershed Protection (CWP) was also asked to participate as a co-consultant. The following workplan is based on a teaming approach with Duffield Associates, DNREC, and CWP with Duffield leading the effort to complete the following tasks:

- Task 1. Project Scoping, Budgeting and Management
- Task 2. Strategy Development
- Task 3. Sub-watershed Delineation

- Task 4. Preliminary (Spring 2007) 319 NPS Grant Opportunities
- Task 5. Watershed Characterization/Baseline Assessment
- Task 6. Pollution Control Opportunities Evaluation
- Task 7. Implementation Strategy

Although Duffield is addressing agriculture in the watershed planning process, DNREC will be taking the primary lead in coordinating this effort. The Sussex Conservation District was contacted to help assess the primary needs of agricultural Best Management Practices (BMPs) in the Broadkill watershed. A conservation planner performed a windshield survey of the watershed, identifying the different types of farming operations present in the watershed. The assessment determined that there were 23 active poultry operations, 3 dairy operations, and 1 swine operation. The dairy operations all have ag waste systems and the swine operation has an ag waste system and a composter. The planner determined the primary need for BMPs in the watershed was for poultry operations. As part of an effort to establish a comprehensive watershed plan in the Broadkill watershed all operators were contacted about implementing BMPs that were needed on their farms with the assistance of cost-share funding from the Nonpoint Source Program. Although most of the poultry operations had manure structures and composters, there was still a need for heavy use area protection pads on many farms. Unfortunately, the requests for assistance exceeded the funding available for this priority watershed initiative. Therefore, in order to determine who would receive funding a ranking summary was performed on every request which prioritized each farm based on measurable water quality benefits to the watershed. With cover crops providing the most cost effective BMP for nutrient removal cost-share funding was provided to 16 farmers totaling $ 117,128 for 2,740 acres. Although the request for funding was much greater, the following structural BMPs totaling $ 107,115 were implemented based a prioritized ranking sheet:

- 3- Heavy Use Area Protection Pads
- 2- Dead Bird Composters
- 2- Manure Storage Structures

Education and Outreach – Broadkill River Watershed

Stormdrain Marking Project

The city of Lewes and the town of Milton are located in the Broadkill River watershed and agreed to participate in an outreach and education effort to mark stormdrains in their city/town limits.

The Delaware Department of Natural Resources and Environmental Control, along with the City of Lewes Board of Public Works, the Center for the Inland Bays, the University of Delaware Sea Grant Program, and the University of Delaware Water Resources organized and implemented a storm drain marking event that took place on Earth Day, 2007, where volunteers worked together to mark the storm drains in the City of Lewes with attractive medallions that say, “No Dumping, Drains To Bay.” This initiative not only increased residents’ awareness of stormwater pollution on water quality, but it also

involved over 60 volunteers who learned more about the issues relating to stormwater pollutants and our waterways.

Storm drain marking in Lewes

Volunteers were divided into groups of two to three and were given instructions on how to properly apply the markers. Each group of two to three were also given a tote full of the items that they needed to properly mark the storm drains, a brochure that depicts how to properly install medallions, a summary of issues relating to stormwater pollutants, in addition to a detailed map of the storm drains that they were to mark (maps created by collecting GPS coordinates of all storm drains within city limits). More than 60 volunteers participated over the two day event.

As part of this effort, DNREC also created a brochure that was sent to city residents. This brochure educated residents about the issues relating to stormwater pollution, touched on some solutions, and informed citizens about the upcoming effort to mark the storm drains in the City of Lewes.

This pilot Storm Drain Marking Program in Lewes was recently duplicated in the Town of Milton on September 8, 2007, with approximately 15 volunteers participating. All Milton residents were also mailed a colored brochure on preventing stormwater pollution.

<u>Beginning Steps - Rain Barrels Project in the Broadkill River Watershed</u>

As part of its comprehensive water conservation plan, the NPS Program is offering rain barrels at a discounted price through a cost-share program. The barrels are currently available only to residents of the Broadkill River Watershed, and are limited to one per household.

Having a rain barrel provides an innovative way to capture rainwater from your roof and store it for later use. Water collected from rain barrels can be used to wash cars and to water lawns, gardens and indoor plants.

"Without a rain barrel, this water would run off your roof and become stormwater, picking up pollutants on its way to a storm drain, stream, lake, bay or ocean," said Environmental Scientist Sharon Webb of the Division's Nonpoint Source Program. "By using a rain barrel, you can lower your water bill, conserve well water in the dry season and reduce polluted stormwater runoff."

Regular retail price for these heavy duty plastic barrels is $114. However, by purchasing the barrels at a quantity discount and providing the cost-share program through a grant from the EPA Nonpoint Source Program, the Division can offer them for just $35 each. The terra cotta colored barrels are made from recycled food grade barrels that originally entered the United States filled with olives and pickles. Thoroughly scrubbed, the barrels may have some small scrapes and scratches from their travels. The barrels are fitted with a screw-on perforated top with an inside mesh screen to help keep out debris, bugs, pets and children, plus a brass spigot and an overflow hose fitting to allow water to be diverted into a second barrel.

To determine if residents live in the Broadkill River Watershed, which is located in eastern Sussex County and includes Lewes and Milton, or to obtain additional information about the program, the University of Delaware set up a web link (http://broadkill.ocean.udel.edu) detailing the rain barrel program providing a map of the watershed.

A limited number of barrels will be available by reservation only. To reserve a barrel, residents must contact the NPS Program. When picking up the barrel, participants are asked to sign an agreement stating they will maintain the barrel for its intended use for a minimum of five years. Reserved barrels will be available for pick up from noon to 6 p.m. Friday, May 9 or from 9 a.m. to 3 p.m. Saturday, May 10 at the University of Delaware - College of Marine Studies in Lewes.

Pollution Control Strategies – Project Implementation

A 1997 federal court case required Delaware to set pollution limits, or Total Maximum Daily Loads (TMDLs) for our waterways. Setting pollution limits is just the first step toward improving water quality. The important next step is the development of pollution control or reduction strategies. To develop these strategies, Delaware formed Tributary Action Teams (TATs) and tasked them with the specific responsibility of drafting formal documents titled, *Pollution Control Strategies*, which include numerous ways to reduce pollution levels. The Pollution Control Strategy (often abbreviated PCS) includes a combination of more than one pollution-reducing method. The PCS objectives are to:

- assist implementation of structural Best Management Practices (BMPs) in TMDL watersheds based on preliminary findings and recommendations of the Whole Basin Teams assigned by the Department of Natural Resources and Environmental Control for agricultural and urban activities;
- implement projects to support the development of TMDLs and accomplish objectives and milestones in Delaware's NPS §319 Management Plan; and

- determine watershed appropriate pollution control strategies for TMDL implementation.

After 6 years of deliberations with a diverse group of watershed interests, DNREC proposed a draft Inland Bays PCS in early 2005. Based on comments received during three public workshops and other meetings with stakeholders, a second draft was presented at three additional workshops in May 2005. As a result of significant concerns raised by the development community, the Department met with developers and their consultants on technical issues and other matters related to the proposed regulations. This group met on the first and third Thursdays of each month through the fall of 2006. The Department committed to providing the House and Senate Natural Resource Committee members and the Sussex County Delegation an opportunity to review the final draft PCS before proceeding with the rulemaking process. However, the public was made aware of modifications in the PCS in areas of buffering, which resulted in several legislators asking the Department to revisit the buffering issue with the Center for the Inland Bays. The Department was hopeful that this review could occur in early 2007, however, it became apparent that consensus could not be reached in a short period of time. Therefore, the buffer portion of the Inland Bays strategy regulation was reserved and the Department committed to a Sussex County-wide buffer regulation by Fall 2007. Public hearings were held for the regulations of the Inland Bays strategy on June 13th and 14th, 2007 and the public comment period closed June 29th. However, Senate Concurrent Resolution No. 18 was issued, requesting DNREC "not to implement the provisions" of the regulation in its present form. DNREC's Secretary Hughes committed to provide a complete regulation, including a buffer provision, on or about October 1, 2007. As of this date, potential buffer provisions are still under discussion. Workshops and hearings are anticipated in spring 2008. The Department hopes that further delays in promulgating PCSs in other parts of the State will be minimized by awaiting the outcome of negotiations over contentious recommendations in the Inland Bays watershed. PCSs have been drafted for the Appoquinimink River, Nanticoke River and Broad Creek, and the Murderkill River. The Appoquinimink River and Nanticoke River and Broad Creek Tributary Action Teams submitted final recommendations to the Department in the fall of 2004. The Nanticoke River and Broad Creek PCS addresses additional actions that will be needed for Delaware to achieve its nitrogen, phosphorus, and sediment load reduction commitments as part of the Chesapeake Bay Program. Unfortunately, the finalized Nanticoke/Broad Creek strategy has been delayed until the Inland Bays strategy, which has many similar elements, is promulgated. The Department anticipates releasing a draft Nanticoke/Broad Creek strategy late spring of 2008.

Four new Tributary Action Teams were active in 2007 and are at various stages of developing PCSs for the Broadkill River, Christina Basin, St. Jones River, and Upper Chesapeake watersheds. The St. Jones Tributary Action Team submitted their recommendations to the Department February 2007. The Christina Tributary Action Team submitted their recommendations to Secretary John Hughes November 2007. The Department expects the Broadkill River and Upper Chesapeake Teams to present their PCS recommendations in the early 2008.

In support of the existing Teams, an annual Delaware Tributary Action Team Conference is held at a central location within the state. The purpose of the conference is to provide a

forum for Team building and an opportunity to share achievements and lessons learned during the process as well as give the Department an opportunity to get feedback from the community and Teams in a different setting. The conference typically includes an update of Tributary Action Team progress and activities, a poster session, keynote speaker, and a speaker panel with representatives from various agencies and organizations invited to provide education to team members about ongoing issues, science and activities. The 5th Annual Delaware Tributary Action Team Conference was held at the Rusty Rudder in Dewey Beach, Delaware on May 12, 2007. With the help of the Center for the Inland Bays, this conference brought attention to the active concerns and functioning projects within the Inland Bays watershed. It provided the opportunity for Tributary Teams and concerned individuals to get a closer look at Best Management Practices and projects within the Inland Bays. The conference consisted of two half day field trips that included a pontoon boat trip on Rehoboth Bay and a bus tour around the Southeastern part of the watershed viewing sites relative to watershed protection. The tour of the bay, interpreted by Ed Lewandowski with the Center for the Inland Bays (CIB), focused on its ecology and brought attention to salient issues and the CIB's habitat restoration projects such as artificial oyster reefs and eel grass growth renewal. The bus tour, interpreted by Chris Bason and Josh Thompson also with the CIB, visited the Anchorage Canal Sediment Capture Forebay Retrofit, a model poultry farm and the Piney Neck Spray Wastewater Treatment Facility, touching on multiple watershed issues and innovative solutions. The conference also included a special lunchtime presentation by Maryland State Parks "Scales and Tales: Wings & Things" program, who presented insightful information about native raptors and their connection to watersheds. The program also gave attendees a special up-close look at the birds, such as a Bald Eagle and an Eastern Screech Owl. Due to lack of funds, we will not hold a conference this year but will into 2009.

To date, Tributary Action Teams have documented 2,772 pounds per day of total nitrogen and 227 pounds per day of total phosphorus reduction to Delaware's surface waters and their proposed Pollution Control Strategies propose to reduce an additional 8,040 pounds per day of total nitrogen and reduced 133 ponds per day of total phosphorus. These measurable reductions will have significant impacts on Delaware's surface water quality.

Inland Bays Watershed

The following activities have occurred during the reporting period for the Inland Bays Watershed:

Nutrient Protocol Development

One of the recommendations made by the Inland Bays Tributary Action Team in their draft Pollution Control Strategy to the Department indicated that "the entire Inland Bays watershed shall be designated as a 'Critical Environmental Area' within

which all land use activities shall be managed for nutrient reductions consistent with TMDL load reductions, or, reductions attributed to 'best available technologies' (BATs) where TMDL load reductions are not feasible." The Pollution Control Strategy regulations proposed for the Inland Bays will likely require each development to be managed for nutrients such that it will have minimal impact to the waters of the Inland Bays. Consequently, the Department developed a nutrient protocol whereby a consistent methodology can be used to calculate nutrient budgets for each proposed development such that each developer will know what is expected of them for that proposed development. A user guide for the Nutrient Loading Assessment Protocol was developed over the summer of 2007 and a seminar was organized by the Center for Inland Bays which helped attendees use protocol using a mock example. A database that contains the results of nutrient protocol for the 2005 PLUS projects was developed and currently, PLUS projects from 2006 and 2007 are being added the database.

Stormwater Best Management Practices

Two schoolyard habitats were designed in the Indian River School District to provide public education about wetlands, nutrient management, and stormwater. Both of these project will be planted may early May 2008. Another demonstration rain garden and buffer was completed at the Millville Town Hall as well a buffer at the Sussex Conservation District office. Both projects were also used as an educational tool for the community as well as providing best management practices to reduce nutrients in these urban areas. Several workshops for homeowners associations were also provided in this watershed to help the communities in the area with stormwater pond maintenance issues.

Appoquinimink Watershed

The following activities have occurred during the reporting period for the Appoquinimink Watershed:

Pet Waste Collection Project

Using grant funding, the ARA was able to purchase 20 pet waste collection stations using each of the following materials: Dogipot containers, cases of biodegradable bags, signs, and posts. After sending letters to homeowners associations and advertising the project in the local newspapers, four communities were chosen to receive the stations in their open spaces and parks. The communities selected included the development of Willow Grove Mill in Middletown, the Town of Odessa, the Town of Townsend and the Town of Middletown. These communities were all provided with educational materials for distribution to residents discussing the need for pet waste collection and how it affects us all.

Jean Birch MOT Senior Center Rain Garden Retrofit

One year after the creation of the rain garden from a dry pond stormwater management area, the ARA is still taking the lead on maintaining the area for the Town of Middletown. Maintenance during 2007 included weed control, mulching, and the addition of more native plants to the area. Plans were devised to move toward a more

maintenance-free upland area by making it strictly a meadow. Sediment and erosion control structures were created by DNREC engineers for implementation in the following years. The ARA was recognized in several local newspapers and magazines for the project as well as by the EPA and Low Impact Development Center as a winner of the Leadership in Low Impact Development awards for Educational Programs.

Education of St. Andrews School students at the rain garden

Riparian Buffer Mapping and Ordinance Creation

The ARA worked with the Town of Middletown on implementing a riparian buffer ordinance, protecting 100 ft from rivers, streams and lakes, all of the floodplain, and 50 ft from wetlands. After meetings with local residents and developers, the ordinance was unanimously passed by Town Council in the early summer of 2007 and implemented into the Town's development process.

Riparian Buffer Revegetation

The ARA began working with landowners to reforest 20 acres of riparian buffers in the Appoquinimink Watershed and to educate all landowners with riparian buffers on or adjacent to their land on the benefits of installing buffers. As such, they sent 1,000 educational packets to high priority revegetation buffer landowners explaining what riparian buffers are and why we should all protect them. After visiting with the highest priority 25 interested residents, 5 were selected for fall plantings along with the Blackbird Creek Reserve. The sites varied from wetlands to lakes to stream side and were planted with over 789 plants as well as seed. Invasive species were removed on needed properties and educational signs were created to be posted along each planted buffer. Also, a nutrient management and pasture management plan was written for one of the landowners who received a buffer and owned a small farm adjacent to a pond.

Salary for Coordinator of Appoquinimink River Association

As part of the Pollution Control Strategy recommendations submitted by the Appoquinimink Tributary Action Team to DNREC, the Team strongly recommended the hiring of a watershed coordinator dedicated to the Appoquinimink Watershed. The watershed coordinator is facilitating the reduction of nutrient loadings in the Appoquinimink by implementing BMPs, developing aggressive BMP outreach and educational programs, and securing funding for BMPs implementation. The Department saw this recommendation as a valid and ultimate goal of the Tributary Team process. Thus, a position was established through the New Castle Conservation District to coordinate the newly formed nonprofit Appoquinimink River Association. This position

has been occupied by a New Castle Conservation District employee for the last three years (starting in April 2004). Funding for the position was provided by the Department, DelDOT, New Castle County, and several grants obtained by the nonprofit organization. Due to Departmental policies, this position could not be maintained. The Board of Directors of the Appoquinimink River Association requested a position be established through the State of Delaware General Assembly. The General Assembly created the position at the end of the last fiscal year and included funding. The position is in the process of being established and hopefully will be filled by mid-year 2008.

Middletown Stream Restoration

Using the Center for Watershed Protection's Appoquinimink Implementation Plan, the ARA visited several high priority stream restoration projects throughout the watershed. An urban stormwater drainage channel draining into a stream that leads to Silver Lake was chosen as the final project. Biological and chemical monitoring plans were developed and started in order to get water quality data pre-construction. Biohabitats was contracted by co-partner, DNREC, to develop the design of the project.

Watershed Newsletter

Continuing the work of sending all 8,000 watershed households educational information, the ARA provided a newsletter to residents discussing native and invasive plants, composting and fertilization. In the fall, the ARA sent the next issue of the newsletter to the 300 residents who signed up to continue receiving the issues. This issue surrounded the topics of winter salting, winter habitat creation and having an environmentally friendly holiday season.

Stormwater Modeling

The ARA partnered with DNREC's Sediment and Stormwater Program on the creation of a stormwater model for the watershed to help make important environmental decisions. The ARA was in charge of the educational parts of the project which included holding a public workshop to discuss the project, writing newspaper articles and creating website pages to promote the project, creating educational giveaway bags to promote the project at outreach events, and collecting information from the public on stormwater issues they are facing in their communities.

Community Wildlife Habitats

Working with the Delaware Nature Society and the Town of Townsend, the ARA began the process to make Townsend the first Community Wildlife Habitat in the state of Delaware. The ARA helped create a Town committee to work with on the process and began discussing potential projects to incorporate towards the recognition. A kickoff educational event was created to gain volunteers and educate the public on habitat creation. Projects that were begun included developing a plan to create a demonstration residential rain garden in town, set-up an environmental education library in town hall, increase Backyard Habitat awareness, and develop a workshop on rain barrel and composting education. One small rain garden was planned for a homeowner in Townsend, DE to reduce runoff to a stream and wetland adjacent to their property.

Broadkill Watershed

The following activities have occurred during the reporting period for the Broadkill Watershed:

Watershed Assessment and Plan

In October of 2007 a watershed-wide stream assessment in partnership with Duffield Associates was done to identify potential projects that will be implemented throughout the watershed. DNREC, Duffield Associates and the Center for Watershed Protection are working together to organize teams of local volunteers to collect basic stream quality/habitat data for the assessment, which will be used to help identify problems and improve water quality. The event began with volunteer training from 8:30 to 9:30 a.m. followed by the assessment, ending mid-afternoon. Approximately 30 volunteers looked for aquatic life such as insects and fish, stability of stream banks, and their ability handle storm events. The teams also inspected areas where streams maybe clogged with soil or debris. Duffield will analyze data gathered by the volunteers and will return to the Broadkill Tributary Team to suggest potential solutions to problems identified during the assessment.

In addition in the watershed-wide assessment, in December of 2007 the Center for Watershed Protection conducted a stormwater retrofit inventory and upland assessment to identify restoration and pollution prevention opportunities using protocols described in the Center‘s Small Urban Watershed Restoration Manual Series, *Stormwater Retrofit Practices* (Schuler et al., 2007) and *Unified Subwatershed and Site Reconnaissance User's Guide* (Wright et al., 2004), respectively. These assessments concentrated within the towns of, but also covered institutional and other commercial areas throughout the watersheds. These assessments did not target agricultural areas already participating in nutrient management planning. During the stormwater retrofit inventory, field teams looked for opportunities to install new stormwater practices or retrofit existing facilities (i.e. dry ponds) to better meet TMDL nutrient load reductions, enhance adjacent stream/wetland restoration projects, and to increase tree canopy cover. The center also visited sites where there is a large amount of untreated impervious cover (parking lots), municipal or public properties that may serve as good
Demonstration sites (schools and town halls).

Upper Chesapeake Bay Watershed

The following activities have occurred during the reporting period for the Upper Chesapeake Bay Watershed:

The Upper Chesapeake Tributary Action Team has been meeting since April, 2006. The team is working as part of the larger Chesapeake Bay Basin and will make recommendations to reduce excess nutrients in the Chester and Choptank Rivers in Delaware.

The team is currently developing its list of recommendations for inclusion in its Pollution Control Strategy. The preliminary list is being debated and refined, with a goal of producing final recommendations and drafting a PCS for release by early 2008.

Rain Gardens and Rain Barrels
A rain garden and outlet structure is planned for a pond in Marydel at the Immaculate Conception Church located in the Upper Chesapeake Watershed. The rain garden and improved outlet will reduce nutrient and other pollutant runoff from the road and parking lots surrounding the pond. Also, a rain barrel workshop is planned for this watershed to provide education to the community about smart yards and give out 50 rain barrels.

St. Jones Watershed

The following activities have occurred during the reporting period for the St. Jones Watershed:

The St. Jones team began on June 8, 2005 and submitted the completed PCS on February 20, 2007, after twenty months of hard work and commitment by all who participated in the process. In February, the St. Jones Tributary Action Team submitted their recommendations for the Pollution Control Strategy to Secretary Hughes of the **Delaware Department of Natural Resources and Control (DNREC)**. They are awaiting a response from his office.

Several other projects are moving ahead in the watershed and team members remain actively involved.

Watershed Assessment and Plan
In November of 2007 a watershed-wide stream assessment in partnership with Duffield Associates was done to identify potential projects that will be implemented throughout the watershed. DNREC, Duffield Associates and the Center for Watershed Protection are working together to organize teams of local volunteers to collect basic stream quality/habitat data for the assessment, which will be used to help identify problems and improve water quality. The event began with volunteer training from 8:30 to 9:30 a.m. followed by the assessment, ending mid-afternoon. Volunteers looked for aquatic life such as insects and fish, stability of stream banks, and their ability handle storm events. The teams also inspected areas where streams maybe clogged with soil or debris. Based on the observations and data gathered by volunteers, Duffield staff will then return to the St. Jones to identify potential solutions to address the problems discovered.

The Center for Watershed Protection also conducted a stormwater retrofit inventory and upland assessment to identify restoration and pollution prevention opportunities for the St Jones watershed. As with the Broadkill the assessment concentrated within the towns of, but also covered institutional and other commercial areas throughout the St Jones. These assessments did not target agricultural areas already participating in nutrient management planning. As with the Broadkill, during the stormwater retrofit inventory opportunities to install new stormwater practices or retrofit existing facilities (i.e. dry ponds) to better meet TMDL nutrient load reductions, enhance adjacent stream/wetland restoration projects, and to increase tree canopy cover were identified.

Silver Lake Revitalization Project
This project entails installing buffers along the St. Jones River in Silver Lake Park in Dover. The first objective of this project is to determine the exact length of the riparian buffer in different areas that have varying distances between the sidewalk and river. The buffer will average 50-75 feet from the riverbank. The area of the buffer will be approximately 10 acres on both sides of the river. The actual design plan was discussed in November of 2007 with the Silver Lake Commission. Various native trees and shrubs will be planted in the buffer by volunteers, DNREC employees, and City of Dover employees. Also, small paths will be cut out of the buffer to provide access to the water. Educational signs will be placed throughout the buffer as well.

Rain Gardens and Riparian Buffers
A rain garden was completed for a homeowners association that is adjacent to a wetland that drains into the St. Jones River. The community helped design and construct the rain garden, and native plants were used that specifically attract hummingbirds and monarch butterflies.

Christina Watershed

The following activities have occurred during the reporting period for the Christina Watershed:

The University of Delaware's Institute for Public Administration - Water Resources Agency (IPA-WRA) has been facilitating the Christina Basin Tributary Action Team since February 2006. The team drafted the Pollution Control Strategy for the Christina Basin from the 39 recommendations the team identified. The PCS contains the tools to meet the TMDLs set for the Delaware portion of the Christina Basin and will serve as a springboard for the agencies and organizations working in the watershed.

The Team held its final meeting on Monday, November 5th at the Chase Center on the Riverfront in Wilmington, when it presented the Christina Basin Pollution Control Strategy to DNREC's Secretary John Hughes. IPA-WRA and the Delaware Nature Society (one of the key players on the team) coordinated the final PCS meeting with the Society's final lecture in their two year series on the Christina Bay watersheds.

The stormwater database from the New Castle County lacked the drainage area of stormwater structure. This particular information is critical to calculate nutrient reduction from stormwater structures. After much deliberation, an employee of the Water Resource Agency and a DNREC seasonal employee developed a GIS model to calculate drainage areas of each stormwater structure. Once the area was calculated, nutrient reduction from stormwater structures were computed. Based on this work, a report was developed on the "Analysis of Stormwater BMPs in reducing Nutrient Loads in Delaware's portion of Christina Basin."

Education and Outreach

Delaware Envirothon

The 2007 Delaware Envirothon was held May 3rd at the James Farm Ecological Preserve in Bethany, with 18 teams of high school students from the First State vying for prizes and places in a challenging environmental competition.

Each team answered questions, reviewed specimens and took measurements in topics dealing with aquatic ecology, soils/land-use, wildlife, forestry and managing cultural landscapes, as well as giving an oral presentation. After more than three hours of testing, the Charter School of Wilmington Team A was crowned as state champions.

Each team member from the first place team was rewarded with a $4,000 per-year renewable academic scholarship from Wesley College and a $500 scholarship from the Delaware Envirothon. The winning team also received an award plaque.

Kent County 4-H placed second in the competition and received the $300 Ernest J. Zimmerman award for use towards an environmental education project at their school. Polytech High School won third place and received the $150 Dean Belt award, and Charter School of Wilmington Team B was awarded $100 for placing fourth.

The state champions will now train for the National Canon Envirothon. This year the event will be held at Northern Arizona University in Flagstaff, Arizona.

Delaware State Fair

NPS staff participated in the Delaware State Fair, again this year. With over 280,000 people in attendance, the Fair provides a great opportunity to interact and educate children and adults on the sources of NPS pollution. A trivia game titled “Environmental Jeopardy” was designed to test people’s knowledge about NPS pollution and inform them on what they can do to reduce NPS pollution around their homes.

The 2007 theme for the DNREC building was “Barnyard Beach Party”! DNREC’s education building at the Delaware State Fair in Harrington is located on East Rider Road on the fairgrounds and was open 10 a.m. until 8 p.m. everyday during the Delaware State Fair Week. The “Barnyard Beach Party” exhibit expands Delawareans awareness of our most important agriculture and tourism sectors of Delaware. As part of the DNREC

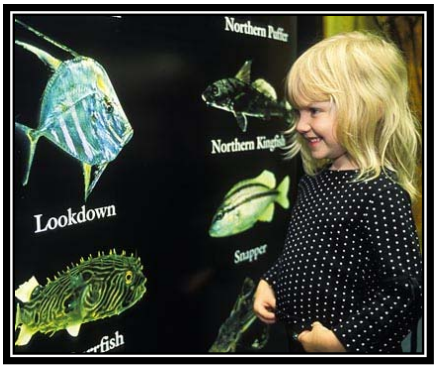
display, the Fish and Wildlife exhibit featured a live fawn for people to view. Visitors were encouraged to respect wildlife, including deer, and allow wild animals to remain in their natural habitat. The exhibit, always a family favorite, included an array of native fish and wildlife to view up close.

In addition, the DNREC building featured 15 displays on the Department's various environmental programs. The Delaware Energy Office's exhibit provided ideas on easy ways homeowners can save money on energy costs. A new mosquito control exhibit highlighted how to reduce pesky mosquitoes in your own backyard. The new Water Resources exhibit engaged all ages and tested their knowledge on the various programs that protect water resources in our state. Information on Delaware's air quality, the harmful effects of ozone, and the ways people can safeguard their health was included in the air quality exhibit.

DNREC's displays and exhibits are designed to encourage public participation in the learning process through hands-on activities and educational games that appeal to both adults and children. Visitors speak one-on-one with DNREC's scientists and educators, who are not only dedicated to preserving the environment but are committed to protecting human health, ecosystems, and the beauty of Delaware's environment.

The NPS display focused on various nonpoint source pollution avenues and an array of remedies, many of which are routinely funded using CWA Section 319 funding. Brochures were also available at the display that provided information on using beneficial plants, conservation landscaping, basinscapes, and basinscapes for wildlife habitat.

Coast Day



Coast Day is another wonderful event for the NPS staff to interact with the public and inform them about NPS pollution.

The University of Delaware, College of Marine and Earth Studies and the Delaware Sea Grant College Program have organized this special day to celebrate Delaware's ocean and coastal resources and showcase the University's efforts in marine research and education. The 2007 event was hosted by the University of Delaware Sea Grant College Program in Lewes. Sea Grant is a partnership between the federal government –through the National Oceanic and Atmospheric Administration (NOAA)–the State of Delaware, and the University aimed at addressing coastal challenges through research, education, and outreach. Over the years, Delaware Sea Grant has helped to address complex issues ranging from shoreline erosion to seafood safety, fisheries decline to the economics of beaches.

Held at the Hugh R. Sharp Campus in Lewes, Coast Day introduces thousands of people each year to the wonders of the sea and the importance of Delaware's marine and coastal resources.

Coast Day began 31 years ago as a small open house designed to introduce visitors to our research. Public interest was so great that Coast Day rapidly evolved into a major event. Now, Coast Day is a highly anticipated Delaware tradition. The event offers something for everyone. Visitors enjoy hands-on exhibits, lectures on popular science topics, ship and laboratory tours, crab races, a crab cake cook-off, seafood cooking demonstrations, a boat show, and much more. Kids have special opportunities to speak with marine scientists and learn firsthand about their discoveries. They can also explore the many fascinating careers available in environmental science fields.

Over the years, more than 200,000 visitors—from nearly all 50 states and several foreign countries—have flocked to Coast Day to learn about cutting-edge coastal and marine research, explore the aquatic world, sample delicious coastal fare, and have a great time.

Coast Day is coordinated by the University of Delaware's Sea Grant Marine Advisory Service and Marine Public Education Office, who work hand-in-hand with a host of organizations. This partnership has resulted in a unique Delaware event that has won state and national awards for environmental education.

A special thanks is extended to the area businesses that have helped bring this celebration of the sea to the public, including the DuPont Company, the Delaware River and Bay Authority, the Delaware River and Bay Lighthouse Foundation, Delmarva Power, Maritrans Operating Company, the National Oceanic and Atmospheric Administration, Sunoco, Inc., The Partnership for the Delaware Estuary, Delaware Water Resources Agency and the Cape Gazette.

Make A Splash with Project Wet

In October of 2007 approximately 760 area school children and teachers learned how to be good water resource stewards at the Seventh annual "Make a Splash with Project WET" festival. The nationwide event was celebrated locally at St. Jones Reserve in Kits Hummock, Delaware.

Students participated in interactive exhibits that teach water education, facts about water resources and water conservation. The St. Jones Reserve provided a wonderful avenue for the students to relate historical water issues to present water resource issues and technology.

Nestlé Waters North America supports the Make A Splash festivals, the largest water education event in the country. "We encourage stewardship of our nation's water resources and protecting them is important for future generations," said Kim Jeffery,

president & chief executive officer of Nestle Waters North America. "This water education day provides programs and tools to get youngsters excited about conserving water and treating it with care all their lives."

These "hands-on" festivals bring together parents, students, teachers, government officials, and enthusiasts of all kinds for one cause: to raise awareness of the need for water education and draw attention to the vital role this precious resource plays in our everyday lives. Established in 1984, Project WET (Water Education for Teachers) is an international water science and education program dedicated to teaching children around the world about water stewardship and conservation.

"The quality of water in ground water and springs is often a reflection of the health of a watershed," said Dennis Nelson, Project WET's founder and executive director. "A healthy watershed is no accident. Our festivals encourage teachers and children to be good watershed neighbors."

Annual NPS Advisory Meeting

The 6th annual NPS advisory committee meeting was held on March 5, 2008 at the USDA – NRCS State Office in Dover. The purpose of the meeting is for information exchange of nonpoint issues as related to the 319 and 6217 programs.

The meeting was well attended by representatives from EPA, NOAA, DNREC, Del-Dot, University of Delaware, Delaware Nature Society, Delaware Forest Service, NRCS, Center for Inland Bays, Conservation Districts, and New Castle County.

Topics for discussion included:

- Program/Project Updates for 2007 Activities
- Implementation of Delaware's Surface Water Task Force Recommendations
- CWA State Revolving Lon Program
- Source Water Protection Implementation in Delaware
- USGS Data Collection and Project Activities in Delaware
- Financing Septic System Upgrades in PCS Watersheds
- Southbridge Special Area Management
- Identification Sources of Runoff
- Citizens Monitoring Groups
- Thank You Delaware Bay Campaign

Positive feedback from attendee's evaluations indicated that the meeting was informative and well worth their time. We have also had requests from individuals outside of the committee to be invited to the meeting.

Appendix A – CREP Program Activity 2007

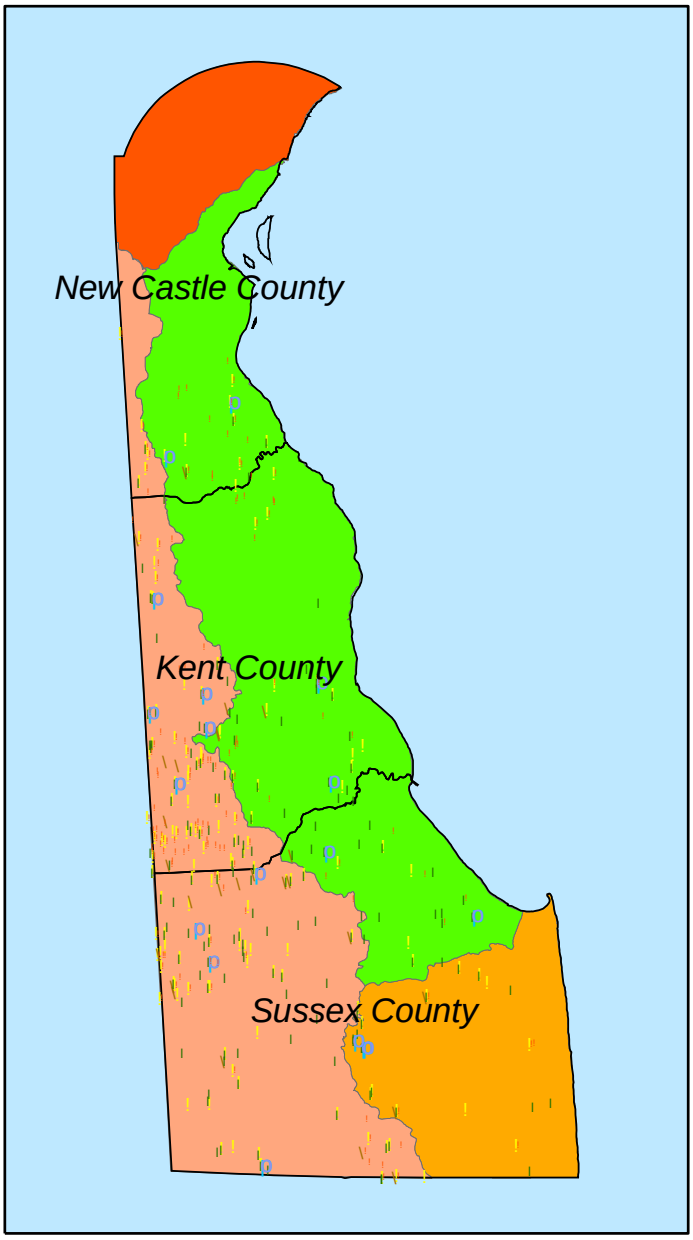
CP3A Acres	CP4D Acres	CP9	CP21 Acres	CP22 Acres	CP23 Acres	CP23A	Total Acres	Rental Cost State	Cost Share State	Delaware Bay Watershed Contracts	Chesapeake Bay Watershed Contracts	Inland Bays Watershed Contracts	Private Contributions
						6.5	6.5	$1,669.89	$1,959.38		1		$653.13
					8.6		8.6	$2,823.80	$926.32		1		$308.77
			1.1				1.1	$173.28	$38.48		1		$12.83
		2					2	$220.50	$2,250.00		1		$1,901.09
	17.2						17.2	$2,788.20	$887.13		5		$308.54
128.4							128.4	$37,328.77	$3,996.30	1			$5,328.00
74.7							74.7	$19,944.06	$2,059.06		5		$655.41
203.1	**17.2**	**2**	**1.1**	**0**	**8.6**	**6.5**	**238.5**	**$64,948.50**	**$12,116.67**	**1**	**14**	**0**	**$9,167.77**

Appendix B – Cumulative CREP Program Activity

	CP21 Acres	CP22 Acres	CP23 Acres	CP4D Acres	CP3A Acres	Total Acres	Rental Cost State	Cost Share State
2001	724.80	40.20	765.00	334.10	530.00	2,115.80	$549,326.77	$160,826.84
2002	320.90	28.40	94.90	158.20	983.50	1,585.90	$434,180.29	$92,639.16
2003	34.90	0.00	37.20	22.10	394.10	488.30	$159,574.58	$24,417.34
2004	94.90	0.00	0.00	32.40	235.00	362.30	$97,578.93	$11,625.13
2005	49.00	0.00	0.00	50.00	192.40	277.50	$77,835.26	$16,718.85
2006	13.90	1.1	15.5	12.9	122.2	165.6	$46,915.02	$10,382.77
2007	1.1	0.0	8.6	17.2	203.1	238.5*	$64,948.50	$12,116.67
	1,239.5	**69.70**	**921.2**	**626.9**	**2,,660.3**	**5,233.9**	**$1,430,359.35**	**$328,726.76**

* Please Note: This total includes the recently added Practices of CP9 and CP23A.

Appendix C – Cumulative CREP Projects 2001 - 2007



BASIN

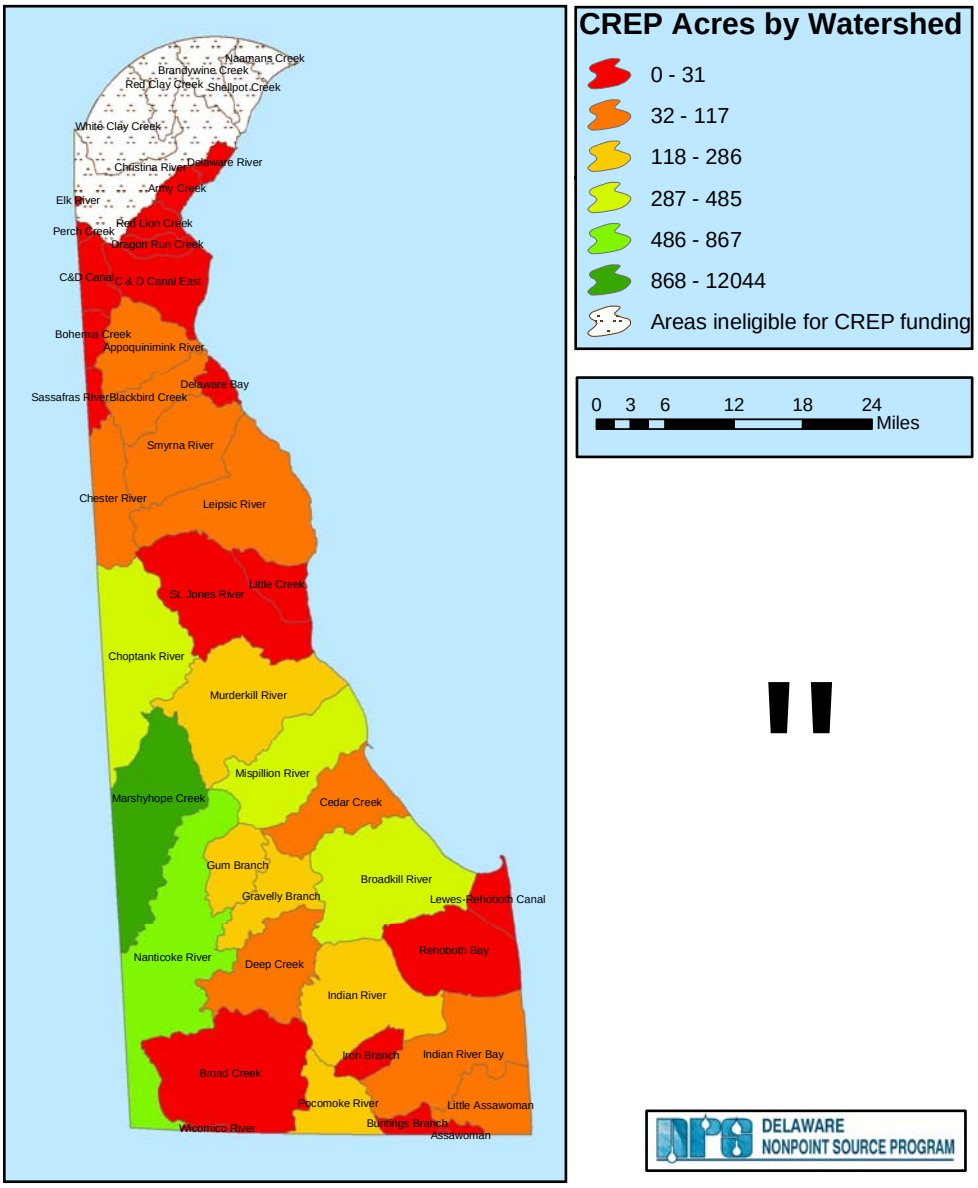
- Delaware Estuary
- Piedmont (not a CREP area)
- Inland Bays
- Chesapeake Bay
- CP23 (Wetland Restoration)
- CP3A (Hardwood Trees)
- CP21 (Grassed Filter Strip)
- CP22 (Riparian Buffer)
- CP4D (Wildlife Habitat)

0 5 10 20 Miles

This map displays all CREP contracts authorized through 12/31/06. Some plantings may not be installed until the 2007 season.

DELAWARE NONPOINT SOURCE PROGRAM

Appendix D – CREP Acres by Watershed 2001 - 2007



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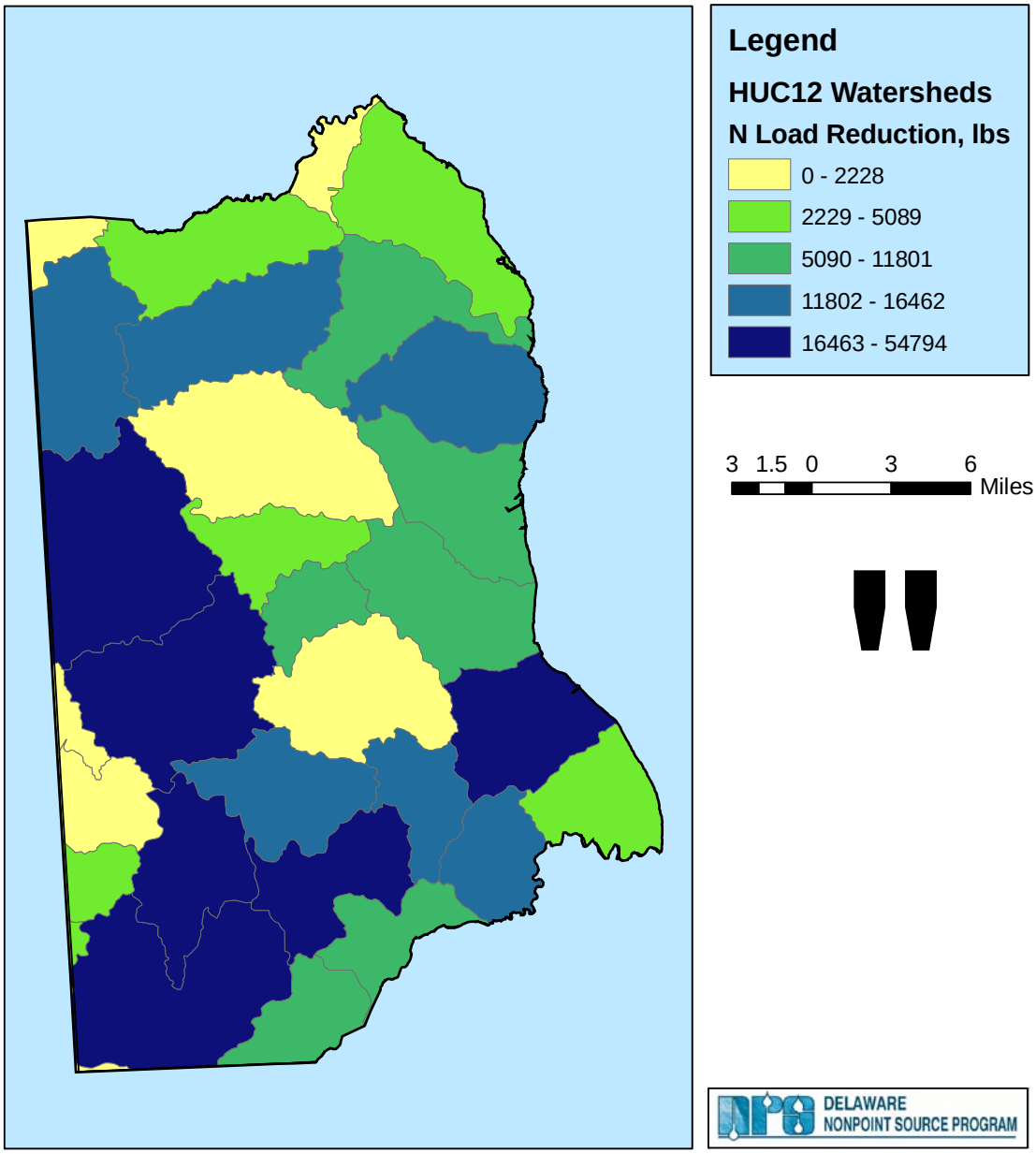
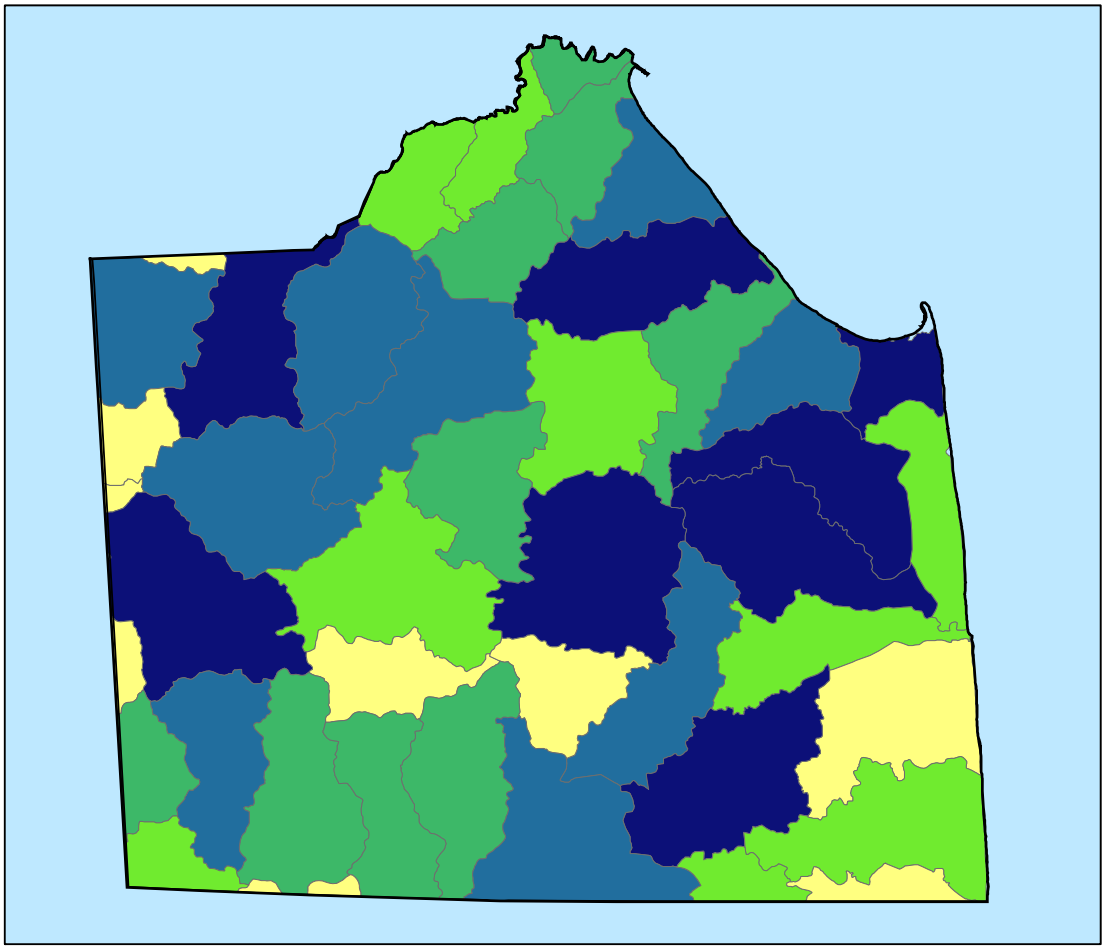
DELAWARE NONPOINT SOURCE PROGRAM

Appendix E - KCD 2007 Load Reductions



Appendix F - SCD 2007 Load Reductions



Legend

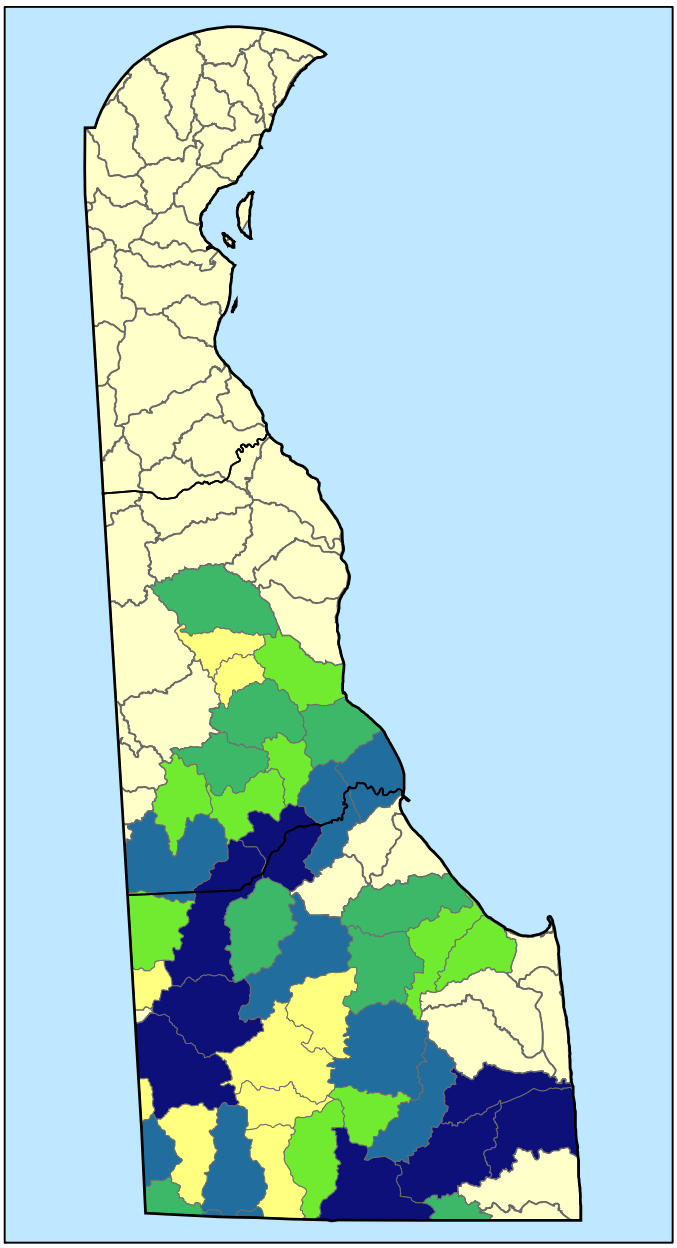
HUC12 Watersheds
N Load Reduction, lbs

- 61 - 2893
- 2894 - 9081
- 9082 - 14065
- 14066 - 18207
- 18208 - 29361

3 1.5 0 3 6
Miles

DELAWARE NONPOINT SOURCE PROGRAM

Appendix G - Nutrient Relocation Program
2007 Nitrogen Load Reductions



Legend

HUC12 Watersheds

N Load Reduction, lbs

- 153.6 - 759.6
- 759.7 - 1352.3
- 1352.4 - 1940.5
- 1940.6 - 4845.0
- 4845.1 - 15627.4
- No Activity

6 3 0 6 12 Miles

DELAWARE NONPOINT SOURCE PROGRAM

Division of Soil & Water Conservation
Department of Natural Resources and Environmental Control
89 Kings Highway
Dover, DE 19901

The Delaware NPS Program receives funding from the Federal Clean Water Act Section 319 Grant.