

Final Evaluation Findings

***Delaware Coastal Management Program
June 1998 – August 2002***

***Delaware National Estuarine Research Reserve
June 1999 – August 2002***



Office of Ocean and Coastal Resource Management
National Ocean Service
National Oceanic and Atmospheric Administration



Delaware Coastal Management Program and Delaware National Estuarine Research Reserve
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OVERVIEW

Sections 312 and 315 of the Coastal Zone Management Act (CZMA) of 1972, as amended, require the National Oceanic and Atmospheric Administration (NOAA) to conduct periodic performance evaluations of federally approved Coastal Management Programs and National Estuarine Research Reserves (NERRs). This review examined the operation and management of the Delaware Coastal Management Program (DCMP) during the period of June 1998 through August 2002 and the Delaware National Estuarine Research Reserve (DNERR) during the period of June 1999 through August 2002. DCMP and DNERR compose the Delaware Coastal Programs (DCP) and are administered by the Delaware Department of Natural Resources and Environmental Control's (DNREC) Division of Soil and Water Conservation.

The fundamental conclusion of this evaluation is that DNREC is successfully implementing and enforcing its federally approved Coastal Management Program and National Estuarine Research Reserve. This document contains 12 Program Suggestions that describe actions that NOAA believes DNREC should take to improve the programs but are not currently mandatory. Program Suggestions that are reiterated in consecutive evaluations due to continuing problems may be elevated to Necessary Actions that address programmatic requirements and *must* be implemented. This document contains no Necessary Actions. DNREC is expected to address the recommendations by the time of the next §312 program review.

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I. INTRODUCTION

The Coastal Zone Management Act (CZMA) of 1972, as amended, established the Coastal Zone Management Program and the National Estuarine Research Reserve System. Sections 312 and 315 of the CZMA require the National Oceanic and Atmospheric Administration (NOAA) to conduct periodic performance reviews of federally approved Coastal Management Programs and National Estuarine Research Reserves. This document describes the evaluation findings of the Director of NOAA's Office of Ocean and Coastal Resource Management with respect to the operation and management of the Delaware Coastal Management Program (DCMP) during the period of June 1998 through August 2002 and the Delaware National Estuarine Research Reserve (DNERR) during the period of June 1999 through August 2002.

The recommendations made by this evaluation appear in **boxes** and follow the relevant section of findings. Two types of recommendations are possible: (1) **Necessary Actions** address programmatic requirements and *must* be implemented by the indicated date; and (2) **Program Suggestions** describe actions that NOAA believes DNREC should take to improve the program but are not currently mandatory. Program Suggestions that are reiterated in consecutive evaluations due to continuing problems may be elevated to Necessary Actions. If no dates are indicated, DNREC is expected to address the recommendations by the time of the next §312 program review. NOAA will consider the findings made by this evaluation when making future financial award decisions regarding DCMP and DNERR.

II. PROGRAM REVIEW PROCEDURES

A. OVERVIEW

NOAA began its review of DCMP and DNERR in June 2002. The §312 evaluation process involves four distinct components:

- An initial document review and identification of specific issues of particular concern;
- A site visit to Delaware including interviews and a public meeting;
- Development of draft evaluation findings; and
- Preparation of the final evaluation findings, partly based on comments from the state regarding the content and timetables of necessary actions specified in the draft document.

B. DOCUMENT REVIEW AND ISSUE DEVELOPMENT

The evaluation team reviewed a wide variety of documents prior to the site visit, including: (1) federally approved Environmental Impact Statements and program documents; (2) financial assistance awards and work products; (3) semi-annual performance reports; (4) official correspondence; (5) previous §312 evaluation findings; and (6) relevant publications on natural resource management issues in Delaware.

Based on this review and on discussions with the Office of Ocean and Coastal Resource Management's (OCRM) Coastal Programs Division and Estuarine Reserves Division, the evaluation team identified the following priority issues:

- The manner in which DCMP and DNERR coordinate with one another and meet individual program goals, as well as how they coordinate with other federal, state, and local agencies and programs;
- The status of both DCMP and DNERR grant tasks and reporting;
- The implementation of state and federal consistency authority;
- The status of DNERR facilities and resource management;
- The status and effectiveness of DNERR staffing and programs, and participation in national research, monitoring, and education programs;
- The visibility of DNERR research, monitoring, and education programs;

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- The status of DNERR's management plan revision; and
- The manner in which DCMP has addressed the recommendations contained in the §312 evaluation findings released in 1998, and the manner in which DNERR has addressed the recommendations contained in the §312 evaluation findings released in 2000.

C. SITE VISIT TO DELAWARE

Notification of the scheduled evaluation was sent to DNREC, DCMP, DNERR, relevant federal environmental agencies, Delaware's congressional delegation, and regional newspapers. In addition, a notice of NOAA's "Intent to Evaluate" was published in the *Federal Register* on July 29, 2002.

The site visit to Delaware was conducted on September 16-19, 2002. Mr. Ralph Cantral, Evaluation Team Leader, OCRM National Policy and Evaluation Division Chief; Ms. Rosemarie McKeeby, Evaluator, OCRM National Policy and Evaluation Division; Ms. Joelle Gore, DCMP Program Specialist, OCRM Coastal Programs Division; Ms. Jennifer Isé, DNERR Program Specialist, OCRM Estuarine Reserves Division; Ms. Elizabeth Mills, Policy Analyst, OCRM National Policy and Evaluation Division; and Ms. Andrea Cooper, Massachusetts Coastal Zone Management Program North Shore Regional Coordinator, formed the evaluation team.

During the site visit, the evaluation team interviewed DCMP and DNERR staff,¹ senior DNREC and other state officials, federal agency representatives, coastal researchers, environmental educators, civic group representatives and private citizens. Appendix A lists people and institutions contacted during this review.

As required by the CZMA, NOAA held an advertised public meeting on September 17, 2002, at 6:00 p.m., at the Richardson and Robbins Building, 89 Kings Highway, Dover, Delaware. The public meeting gave members of the general public the opportunity to express their opinions about the overall operation and management of DCMP and DNERR. Appendix B lists individuals who registered at the meeting.

The crucial support of DCMP and DNERR staff with the logistics and planning of the site visit is gratefully acknowledged.

¹ The Reserve Manager has been on active duty with the Army National Guard since May 2002. Due to his deployment in Saudi Arabia, he was unable to participate in the evaluation review process.

III. THE DELAWARE COASTAL PROGRAMS

A. DELAWARE COASTAL PROGRAMS DESCRIPTION

The Delaware Coastal Management Program (DCMP) and the Delaware National Estuarine Research Reserve (DNERR) are known as the Delaware Coastal Programs, which are housed within DNREC's Division of Soil and Water Conservation. The mission of the Delaware Coastal Programs is to preserve, protect, develop and where possible restore and enhance the resources of Delaware's coastal zone through effective administration of DCMP and DNERR. The programs coordinate their efforts throughout DNREC and with many outside public and private organizations in order to protect the state's coastal environment against increasing pressures ranging from residential development to the competing demands of recreation and commerce on state waters.

B. ACCOMPLISHMENTS, REVIEW FINDINGS AND RECOMMENDATIONS

1. Staff

DCMP and DNERR staff must be recognized for their tireless work, responsiveness, perseverance, creativity and dedication to coastal management. The staff's commitment to and enthusiasm for their work have gained respect for DCMP and DNERR both within DNREC and throughout Delaware. A clear understanding of current threats to the state's coastal resources as well as a strong focus on priority coastal issues is evident in DCMP's and DNERR's results-oriented approach to coastal management.

2. Coordination and Collaboration

The coordination between DCMP and DNERR is impressive. Both programs often work together to conduct targeted projects that address high-priority issues affecting Delaware's coastal resources. Such projects include:

- Developing tools to assist conservation planners use riparian buffers to prevent erosion and water pollution.
- Providing sustainable habitat for native plants and animals.
- Providing detailed Geographic Information Systems analysis and support to develop a new setback line, which will be needed to update Delaware's Regulations Governing the Use of Beaches.
- Sustaining coastal ecosystems and limiting the impacts of land development.

The combined efforts of both programs consistently yield high quality results. Both DCMP and DNERR have evolved during the evaluation period and are clearly filling a resource management and technical assistance niche in Delaware. DCMP and DNERR also strive for the most efficient and effective use of limited resources through

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collaboration with local governments, state and federal agencies, nongovernmental organizations, and universities. This collaboration often has led to strong partnerships and increased project success. NOAA strongly encourages DCMP and DNERR to continue developing and enhancing partnerships with local governments, state and federal agencies, nongovernmental organizations, and universities. DCMP and DNERR should explore opportunities to improve coordination with programs that have similar or overlapping research and education agendas.

While the coordination between DCMP and DNERR has accomplished more than either program could accomplish on its own, it is not surprising that the identities, missions, staff roles and project funding sources of these two networked programs are frequently confusing to those who interact with the programs. During the evaluation site visit, it was clear to the evaluation team that representatives of state agencies (including DNREC), federal agencies, academic institutions and the general public often did not recognize DNERR as a distinct program separate from DCMP. DNERR is part of a larger system of research reserves. In order for state agencies, local governments, and the public to understand DNERR's contribution to and role in the whole reserve system, they must perceive the reserve as a distinct entity. Thus, it is important that each program, although closely linked to one another, maintain a strong, individual identity. The evaluation team also saw some evidence of a lack of communication between the DCMP Manager and the DNERR Acting Manager on certain issues, resulting in a lack of consistent involvement of DNERR management staff in some major decisions involving the reserve. It is critical that DNERR management staff is fully informed of and involved in all decisions that may affect the reserve. While the close working relationship between DCMP and DNERR is commendable, each program must retain individual responsibility with regard to decision-making and the authority to fulfill its mission effectively.

DCMP/DNERR #1 - PROGRAM SUGGESTION: NOAA strongly encourages DCMP and DNERR to maintain strong, individual identities. Also, each program should clearly define management staff roles and responsibilities. Administrative decision-making processes must involve appropriate management staff in major program decisions.

DCMP/DNERR #2 - PROGRAM SUGGESTION: Prior to grant submission, DCMP, DNERR, and NOAA should jointly discuss all annual grant tasks for both programs. It is important for the DCMP Manager, DNERR Manager, NOAA DCMP Liaison, and NOAA DNERR Liaison to develop grant proposals cooperatively prior to grant submission to NOAA. Specifically, the DCMP Manager, DNERR Manager, NOAA DCMP Liaison, and NOAA DNERR Liaison should identify grant tasks with crossover funding. They should also ensure that resource sharing is mutually beneficial and supports both individual and national program missions and goals.

3. Science Based Habitat Considerations and Beach Management

Delaware Bay provides important habitat for migratory shorebirds and has been identified as a primary staging area along the Atlantic Coast. Up to one million

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shorebirds use the estuary's resources during spring migration. Delaware Bay also provides habitat for the world's largest population of spawning horseshoe crabs; however, concern over a possible population decline has arisen in recent years. This possible decline has been brought to the public's attention through harvest restrictions promulgated by the Atlantic States Marine Fisheries Commission. Questions about the restrictions' impact on migratory shorebirds and a lack of scientific information have resulted in controversy at local, state, national and international levels.

DCMP and DNERR have worked extensively on research questions related to horseshoe crabs and shorebirds. The research has been divided into four phases: (1) participation in an international banding expedition in Argentina; (2) exploration of the shorebird management implications of bay beach replenishment projects; (3) identification of the variety of habitats for feeding, roosting, and other staging activities required by shorebirds during the migratory stopover and development of guidance for critical habitats; and (4) completion of a survey of horseshoe crab egg density on Delaware Bay beaches replenished with sand and evaluation of the impacts of replenishment on horseshoe crab spawning. Research projects conducted during the evaluation period include:

- Quantification of horseshoe crab egg populations and spawning suitability on Delaware Bay beaches
- Improving understanding and management of shorebirds staging on Delaware Bay – impacts of bay beach replenishment and other management actions
- Energetics of refueling and flight of red knots staging on Delaware Bay beaches
- Analysis of the potential of beneficial use of dredge spoil for enhancing Delaware Bay horseshoe crab spawning areas
- Investigating ways to improve Delaware Bay beach replenishment projects to maximize the potential for restoration of critical horseshoe crab and shorebird habitat.

State fisheries staff and the Atlantic States Marine Fisheries Commission Data currently are using data from these research projects to consider the science-based need for any changes to current harvest restrictions and catch quotas for horseshoe crabs.

During the evaluation period, monitoring of shorebirds was conducted by DCMP and DNERR working jointly with the British Trust for Ornithology (BTO), the Wash Wader Ringing Group (WWRG) and the Delaware Shorebird Monitoring Team, a local group composed of volunteers from DNERC, U.S. Fish and Wildlife Service, Delaware Museum of Natural History, Tri-State Bird Rescue, U.S. Geological Survey, University of Georgia, Delaware and New England Region Audubon Societies, Sierra Club and Friends of the Delaware National Estuarine Research Reserve. The DCMP and DNERR partnership with BTO and WWRG has provided the programs with a variety of benefits, including enhanced training opportunities. For example, the international members formally trained the local team in methods necessary for implementation of a long-term shorebird-monitoring program. This partnership has also raised the visibility of both DCMP and DNERR and their horseshoe crab and shorebird monitoring initiatives.

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NOAA recognizes the value and creativity of DCMP's and DNERR's horseshoe crab and shorebird research and its potential benefit for beach replenishment. However, further clarification of the objectives and goals for the implementation of the research is needed. The next step is for research to be translated into information that can be used by local and regional coastal decision-makers to develop policies, management strategies and regulatory tools.

DCMP/DNERR #3 - PROGRAM SUGGESTION: NOAA encourages DCMP and DNERR to continue to refine the objectives and goals for the implementation of the horseshoe crab and shorebird research and its application to management. Long-term management priorities and strategies should be clearly defined.

IV. THE DELAWARE COASTAL MANAGEMENT PROGRAM

A. COASTAL AREA DESCRIPTION

Delaware's Atlantic coastline consists of a series of barrier beaches and dunes from Cape Henlopen to Fenwick Island, open only by one large inlet at the Indian River Bay. The Delaware Bay and Inland Bays have all the qualities of a mid-Atlantic estuary – strong riverine influences near the headwaters and strong oceanic influences near the Atlantic. From Lewes to Smyrna and Woodland Beach, large marsh areas dominate the region, with associated narrow beaches. Large migratory populations of shorebirds in the spring and waterfowl in the fall populate Delaware Bay. Watermen harvest blue crabs, oysters and fish in these coastal waters throughout most of the year. The National Audubon Society and the American Bird Conservancy designated Delaware's coastal zone an Important Bird Area of Global Magnitude due to its mosaic of important habitats critical to the life cycle of many bird species.

Delaware's many natural and coastal resources are critical for the state's environmental and economic well-being:

- Nearly 25 miles of sandy beaches border the Atlantic Ocean, including 12 miles in state parks.
- At least 33 species of waterfowl, 19 species of raptors, 160 species of songbirds and 45 species of mammals inhabit the state; Delaware's waters are home to at least 284 species of freshwater and saltwater fish.
- Estuarine and coastal wetlands provide habitat for marine and terrestrial life, trap sediment, filter pollutants, recharge groundwater and prevent erosion.
- Delaware Bay provides habitat for the world's largest population of spawning horseshoe crabs.
- Other natural resources include sand and gravel deposits, natural gas deposits that have the potential to serve as natural gas supplies and resources with the potential to generate low-temperature geothermic energy.
- Ports along the Delaware River and its tributaries handle about 117.7 million tons of imports and 75.4 million tons of exports each year. The Delaware Bay handles about 85 percent of the east coast's oil imports and serves six major refineries.

B. PROGRAM ADMINISTRATION

DCMP, established in 1979, works to protect, develop and where possible enhance the coastal resources of the state. DCMP is housed within DNREC's Division of Soil and Water Conservation, but it is a networked program whose authorities are implemented throughout other divisions, including Water Resources, Fish and Wildlife, Parks and Recreation, Air and Waste Management and the Office of the Secretary.

The entire state is included in the coastal management area which encompasses three distinct segments: (1) the barrier islands and beaches bordering the 24.5 mile Atlantic shore from Cape Henlopen to Fenwick Island; (2) the three inland bays (Rehoboth, Indian

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River and Little Assawoman) located between the barrier islands and the mainland; and (3) the Delaware Bay and River system from Cape Henlopen to the Pennsylvania border.

Management of Delaware's coastal resources has been divided into two distinct zones: (1) the coastal strip, and (2) the remainder of the state. The coastal strip, as defined by the Delaware Coastal Zone Act, is a stretch of land averaging four miles in width along the entire shoreline. DNREC manages activities in its approved coastal zone management area primarily through implementation of five state laws:

- *The Delaware Coastal Zone Act* – prohibits new facilities of heavy industry and bulk production transfer from locating in the coastal strip and subjects manufacturing uses to a permit to ensure protection of coastal resources. The Act does not regulate commercial, residential, warehousing, or distribution activities. This Act covers only the sensitive coastal strip.
- *The Minerals in Submerged Lands Act* and *The Subaqueous Lands Act* – regulate uses on state underwater lands from mean high tide to the limits of state jurisdiction and protect all designated tidal wetlands and all submerged lands. The Acts require that a state permit be obtained before any construction, dredging, filling, excavating, or utility crossings can occur in these areas.
- *The Beach Preservation Act* – controls uses on beaches and dunes, with generally no construction allowed on beaches or on primary dunes. Most other activities taking place landward of the primary dune, but within the Act's jurisdiction, require a permit based on the potential for shore erosion and flooding impacts, damage to other property, and feasible alternatives.
- *The Wetlands Act* – regulates activities in tidal (saline and fresh) and certain nontidal wetlands greater than 400 contiguous acres to ensure protection of the resources.

Other management authorities applying throughout the entire coastal zone include: the Erosion and Sediment Control Act (ESCA), the Land Use Planning Act (LUPA), the Natural Areas Preservation System Act and various public investment authorities. All of these statutes, with the exception of the ESCA, are implemented directly by Delaware. The enabling legislation for DNREC's Sediment and Stormwater Program, the ESCA, can be implemented locally with delegation to county and municipal agencies, to the conservation districts and to the Delaware Department of Transportation following state approved and DNREC enforced standards for erosion, sediment and stormwater control. The authority for implementing the DCMP is provided in these laws and by Executive Order 43 (Carper, 1996), which requires all state agencies to enforce the goals, policies and objectives of the DCMP in coordination with DNREC.

In this system of shared management authority, planning and zoning are a local responsibility. The LUPA provides a formal coordination mechanism for local governments to comment on proposed actions. The 1988 Quality of Life Act and the 1995 Shaping Delaware's Future Act provide the basis for current land use planning efforts. These Acts required Delaware's counties to develop Comprehensive Land Use Plans by 1996 and to update the plans on a five-year cycle. The plans must address

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future land use, circulation, water and sewer, conservation, recreation and open space, housing, intergovernmental coordination, community design, historic preservation and economic development. In 2001, Governor Minner launched the “Livable Delaware” initiative, which seeks to curb sprawl and direct growth to areas where state, county, and local governments are most prepared for it in terms of infrastructure and planning. The initiative builds on the Strategies for State Policies and Spending, which were adopted in 1999.

C. ACCOMPLISHMENTS, REVIEW FINDINGS AND RECOMMENDATIONS

1. Delaware Coastal Nonpoint Program

DCMP led the development of Delaware’s Coastal Nonpoint Program, a networked program with implementation responsibilities distributed throughout the state. The Delaware Coastal Nonpoint Program was developed in accordance with §6217 of the Coastal Zone Act Reauthorization Amendments of 1990. In July 1995, Delaware submitted the program to NOAA and the U.S. Environmental Protection Agency (EPA) for federal approval. NOAA and EPA approved the program, subject to certain conditions, in October 1997. Delaware worked to meet the conditions, and the program was fully approved in March 2002. NOAA commends Delaware on becoming the ninth state to receive full approval for its Coastal Nonpoint Program.

A great deal of coordination among agencies is required for successful Coastal Nonpoint Program implementation. One of the key instruments of program cooperation in Delaware is a Memorandum of Understanding (MOU) between DNREC, the Delaware Department of Transportation, and the Delaware Department of Agriculture to collaborate in addressing nonpoint source pollution throughout the state. The MOU was signed in 1995 and renewed in 2002 to include best management practices implementation on agency owned lands. Coordination is enhanced by the Nonpoint Source Advisory Committee, which includes representatives of DNREC, Delaware Department of Transportation, Delaware Department of Agriculture, University of Delaware Cooperative Extension, Conservation Districts, U.S. Department of Agriculture, U.S. Fish and Wildlife Service, Sea Grant and two National Estuary Programs. The Coastal Nonpoint Program and the §319 Nonpoint Source Program also work together to avoid duplication. Coordination with Delaware’s Total Maximum Daily Load (TMDL) program occurs through participation in Pollution Control Strategy Workgroups and Tributary Action Teams. This ensures implementation of management measures as tools to help meet court-ordered TMDL water quality improvements. Additionally, DCMP has developed a website describing the Coastal Nonpoint Program and its goals.

Many program implementation activities currently are underway:

- *Tracking and Monitoring System* – Developing an integrated system to monitor and assess progress on nonpoint source pollution control through a NOAA Coastal Management Fellowship award;

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- *Onsite Inspection Pilot Program* – Supporting proper inspection and maintenance of onsite wastewater disposal systems;
- *Delaware Riparian Buffer Initiative* – Developing tools to help conservation planners prevent erosion and water pollution with riparian buffers;
- *Clean Marina Program* – Developing a voluntary program that will challenge marinas to identify opportunities and implement practices to reduce and control pollution associated with boat operations and facilities management;
- *Innovative Stormwater Practices* – Monitoring water quality of multicell vegetated forebay systems designed to capture sediment and other pollutants from stormwater that would otherwise enter neighboring waterways; and
- *System-wide Monitoring Program* – Supporting nonpoint source pollution control programs through DNERR’s local networks of continuous water quality monitoring stations in the St. Jones River and Blackbird Creek watersheds.

NOAA commends DCMP for its role in the approval and implementation of the Coastal Nonpoint Program and encourages continuation of innovative partnerships and projects as the program evolves.

2. Federal Consistency

In addition to federal funding, another major incentive for a state to join the National Coastal Management Program is the ability to apply federal consistency requirements. Under §307 of the CZMA, DCMP must review consistency determinations or certifications of proposed federal actions to determine if they are consistent with the state’s laws, rules, and regulations that are the basis for DCMP’s enforceable policies. Federal consistency applies to federal actions that reasonably could be expected to affect any land or water use or natural resource of the state’s coastal zone.

Each year, DCMP staff review an average of 145 federal activities within the state, including federal licenses and permits, direct federal actions, and federal assistance to state and local governments. The majority of projects receive a consistency concurrence, usually after recommended changes are made to fully comply with DCMP policies. Coordination with other review agencies is usually initiated early in the process. DCMP representatives attend monthly Joint Permit Process meetings where applicants are invited to present their proposed projects and receive input from both federal and state resource agencies at the beginning of the project development process. The agencies also advise applicants as to what permits will be required. Once requests for federal consistency concurrence are received by DCMP, queries are sent to those agencies likely to have comments or concerns.

NOAA commends DCMP on the steady progress it has made during the evaluation period to improve the federal consistency review process. One such improvement is DCMP’s coordination with the Delaware Natural Heritage Program on U.S. Army Corps of Engineers (USACE) Nationwide Permits, which are used for projects of limited scope and impact. According to agreements with the USACE, all approved Nationwide Permits were considered consistent with the policies of DCMP due to their minimal impacts, and

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applicants were not required to obtain individual federal consistency certifications. Recent changes to the Nationwide Permit Program have increased the ability of the state to review Nationwide Permits that may have larger impacts on coastal resources due to their location. To implement these changes, DCMP developed an Arc-View Geographic Information Systems (GIS) tool that allows resource agencies to determine whether a proposed project lies within a Regional Condition Area. Such projects require a comprehensive review, including federal consistency certification. Under a signed agreement between DCMP, DNREC Division of Water Resources, and DNREC Division of Fish and Wildlife, the Natural Heritage Program is using the GIS tool to determine whether proposed projects lie within one of the Regional Condition Areas. This agreement improves efficiency and ensures coordination between the resource agencies regarding consistency determinations.

Other federal consistency accomplishments include:

- Publishing updated approved policies for federal consistency reviews;
- Developing a federal consistency tracking database;
- Developing a Nationwide Permit tracking database;
- Increasing coordination with resource agencies, including DNREC's Divisions of Fish and Wildlife, Water Resources, Air and Waste Management, USACE, and EPA, through participation in monthly Joint Permit Process meetings; and
- Increasing public awareness of federal consistency through targeted outreach including presentations, publications and a website.

In 2003, DCMP will conduct a comprehensive legal review of its policies to ensure that cornerstone coastal resource policies include appropriate language as well as to align the policies more closely with the focus of the CZMA. DCMP also is working to incorporate the CNP enforceable policies into its approved coastal management program for use in federal consistency reviews. Additionally, DCMP will seek to improve coordination among agencies and to increase the awareness of federal consistency and its importance to state coastal resources.

While DCMP has made a great deal of progress in the federal consistency process, challenges remain. The application process and requirements remain unclear and confusing to many applicants. Additionally, although coordination with other agencies has improved, differences in agency review time frames, workloads and priorities continue to pose difficulties. Differing time frames, particularly for applications requiring a tidal wetland or subaqueous permit from DNREC's Division of Water Resources, routinely create extensive delays in the federal consistency review process. This results in either USACE sending the applicant a provisional permit or in DCMP issuing a consistency certification with conditions. It is extremely difficult to ensure that these conditions are met due to a lack of environmental enforcement and litigation ability. NOAA will work with DCMP to resolve questions regarding federal consistency procedures, timelines and legal issues.

DCMP #1 - PROGRAM SUGGESTION: NOAA encourages DCMP to continue improving the federal consistency process by strengthening current efforts, including: (1) targeted education and outreach to prospective applicants; and (2) coordination with DNREC's Division of Water Resources.

3. Technical Assistance to Local Governments

The most visible problem in Delaware's coastal management area is the sustained secondary and cumulative impacts of coastal growth and development. Intense pressures are placed on natural resources when unregulated development occurs along the coast. Responding to this problem requires action at both the county and municipal levels, where most land use and zoning decisions are made in Delaware. However, local governments often lack the technical expertise and resources necessary to address secondary and cumulative impacts of coastal development.

DCMP has worked to fill the technical expertise and resource gap at the local government level by providing a great deal of support and assistance through innovative partnerships and programs. For example, a pilot grant program provides seed money to local government agencies specifically to improve coastal and natural resource management at the local level. DCMP developed detailed grant criteria to guide the use of \$306 funds in this effort, and a request for proposals was sent to all local governments in Delaware in October 2001. DCMP staff provided guidance to interested local government staff during development of their grant proposals and reviewed all proposals based on the predetermined criteria. Funding is made available to improve the flow of resource management decisions to local government agencies, to assist with incorporation of resource management considerations into comprehensive land use plans, and to develop implementing ordinances that improve resource management at the local level. DCMP announced proposals that were accepted for funding in January 2002. Projects currently are in various stages of implementation, and DCMP provides in-kind technical expertise where needed to help local government staff ensure the success of grant projects. One such project, "Land Planning with Conservation Design" in New Castle County, is already beginning to show promising results.

Another example of DCMP's work to provide technical assistance to local governments is the Kent County Resource Protection GIS module, which was developed to assist the county in its land use planning decision-making process. The module was developed by a working group that identified key issues to address in order to better deal with secondary and cumulative impacts of land use decisions. County, state and federal staff participated in the workgroup. The module contains pre-application and growth management components. The final prototype system was delivered to Kent County in 1998. The county has continued to expand its use of GIS and to modify its approach to meet its specific needs. The statewide expansion of systems such as the Kent County Resource Protection Module has great potential to improve both the coordination between various levels of government as well as routine land use decision-making in Delaware. NOAA commends DCMP's work to provide technical assistance to local

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governments. These efforts promote better planning by local governments and build valuable relationships for future partnerships.

4. Environmental Indicators Initiative

Delaware's General Assembly enacted the Delaware Coastal Zone Act of 1971 to control the location, extent and type of industrial development in Delaware's environmentally sensitive coastal zone. However, the details of the Act's regulations proved to be a continuing area of controversy. After several unsuccessful attempts to develop regulations, a Coastal Zone Regulatory Advisory Committee was established in 1996. An 18-month period of consensus building led to the development and ratification of a Memorandum of Understanding (MOU) by the advisory committee. The MOU formed the basis for regulations that were adopted in May 1999. The MOU directed DNREC to develop several tools to better assess whether activities proposed for coastal zone permits would ensure environmental improvement while providing industry with the flexibility to remain competitive. The tools were to include: (1) a set of environmental goals specific to Delaware's coastal zone; and (2) prioritized environmental indicators to assess and track progress towards these environmental goals.

DCMP has been integrally involved in the entire environmental indicators effort. On behalf of DNREC, DCMP recruited interested representatives from various stakeholder groups to serve on the Environmental Indicators Technical Advisory Committee (EITAC). The committee worked to meet its mandate by first developing broad goals in four issue areas: (1) air quality; (2) water resources; (3) habitat and landcover; and (4) living resources. EITAC then developed fourteen prioritized environmental indicators with a list of 47 parameters for the coastal zone and evaluated each indicator's implementation potential by considering the availability of useful data. In March 1999, EITAC provided its recommendations to DNREC.

Subsequent to EITAC's initial work, refined indicators were identified and are being developed either from existing data, or through establishment of protocols to collect information that is currently unavailable. Several recent DCMP environmental indicators projects include mapping purple loosestrife, common reed (*Phragmites*) trend analysis, 1937 historical photography and mapping of forest cover, and an osprey toxicity study. DCMP plans to continue work on several indicators including:

- Forest quality and quantity
- Shorebird health
- Horseshoe crab spawning density index
- Bird populations
- Invasive species
- Contaminant exposure in ospreys

NOAA applauds DCMP for its leadership of and contributions to Delaware's environmental indicators development process.

DCMP #2 - PROGRAM SUGGESTION: NOAA encourages DCMP to expand the application of data and products generated by the environmental indicators process to coastal management. NOAA also urges DNREC to ensure use and refinement of the environmental indicators as an integral part of the effort to achieve the coastal zone environmental goals identified by the process.

5. Pea Patch Island Heronry Region Special Area Management Plan

Pea Patch Island, located in the Delaware River, is home to the largest colony of nesting herons on the East Coast north of Florida and is considered to be a wildlife resource of both local and national significance due to its size and persistence. A decline in the number of nesting herons and concerns about reproductive success resulted in the development of a Special Area Management Plan (SAMP) for the region surrounding the island.

NOAA commends DCMP for its leadership in the development of the Pea Patch Island SAMP, which was a consensus-based effort involving representatives from federal, state and local government agencies, nonprofit organizations and industry. The purposes of the SAMP were to: (1) outline a broad, ecosystem-based approach to protecting and improving the resources that support the heronry; (2) increase knowledge and awareness of the heronry; and (3) ensure that necessary commitments were made for the long-term protection of the heronry. Through a lengthy process of meetings and workshops, participants identified and characterized important issues within the region that might impact the health of the heron colony. Participants then developed a list of potential strategies to address problems in each issue category. The list was narrowed down to 28 strategies using criteria such as likelihood of completion, agency participation and availability of funding. The strategies are the foundation of the SAMP.

The SAMP process has several notable accomplishments. Twenty-one of the 28 strategies have been implemented; each varies in degree of completion and level of success. The heronry has been designated a Continentally Important Bird Area. The SAMP process also has resulted in enhanced cooperation between governmental agencies and nongovernmental organizations in working toward solutions for regional problems. The Delaware Estuary Program has incorporated completion of SAMP strategies into its plans for habitat and living resources. As part of this effort, the New Jersey Coastal Management Program is considering changing its Coastal Area Facilities Review Act Rules to designate important foraging areas as critical habitat.

While the SAMP development is a great achievement, implementation has been hampered by a lack of active participation from cooperating organizations. Most of the implemented strategies were funded and led by DCMP, with little financial or staff support from other participating organizations. Organizational structures, priorities and funding limitations often restricted groups' abilities to fully participate.

DCMP #3 - PROGRAM SUGGESTION: NOAA encourages DCMP to continue implementation of the Pea Patch Island Heronry Region SAMP. DCMP should coordinate the efforts of cooperating agencies, nongovernmental organizations and individuals to reevaluate their commitment to the SAMP, to outline the strategies that align with their programs' missions and goals, and to commit the resources needed to accomplish these strategies. DCMP should explore options to provide incentives to cooperating organizations, including outside funding such as a management plan implementation grant that could provide funds for additional staff to assist with implementation or for cooperating organizations to participate more fully.

6. Statewide Dredging Policy Framework

Because issues related to dredging involve differing interests and various levels of project review and regulatory oversight, DCMP developed a Dredging Policy Framework through a collaborative decision-making process. A working group structure was used, with members providing background expertise on the various components of the dredging process and advising DCMP on the content of the Policy Framework document. This collaborative decision-making relied fundamentally on the participation, input, and agreement of resource managers, scientists and commercial and residential interests.

The goal of the Dredging Working Group was to develop and implement a Statewide Dredging Policy Framework. The framework had several purposes:

- Provide clear guidance and early coordination between regulatory agencies and applicants;
- Provide a basis to evaluate project justification based upon economic and environmental impacts;
- Identify data requirements and provide resources to maximize the use of existing information;
- Identify preferred dredging methods and disposal options, including beneficial uses; and
- Provide education and public outreach regarding dredging activities in state waters.

The Delaware Statewide Dredging Policy Framework was finalized and distributed in February 2001, and DCMP uses the framework for federal consistency reviews involving dredging operations. DCMP continues to work with interested organizations to implement the framework. NOAA applauds DCMP on this effort.

V. THE DELAWARE NATIONAL ESTUARINE RESEARCH RESERVE

A. RESERVE SITE DESCRIPTION

DNERR has two components that represent coastal habitats found within the Middle Atlantic subregion of the Virginian biogeographic region (excluding the Chesapeake Bay). These sites contain a range of natural and cultural features that make the reserve an excellent field laboratory for studying the impacts of human activity on ecosystems and for raising public awareness of the need for coastal conservation in Delaware.

The more seaward St. Jones River component consists of approximately 3,750 acres distributed along five and a half miles of medium-salinity tidal river located at the lower end of the St. Jones River watershed. The river discharges into mid-Delaware Bay. The St. Jones component contains 35 parcels of land held by 23 private landowners, DNERR and one other state agency. Within the St. Jones component's designated boundaries, about 698.5 acres of tidal marshes, upland fields, woodlots, and croplands were purchased or protected by DNERR in 1991-92, but the remaining majority of the component remains in private ownership.

The Ted Harvey Conservation Area is adjacent to the eastern side of the St. Jones component. The conservation area is owned and managed by DNREC's Division of Fish and Wildlife and consists of 2,019 acres of woodlands, upland fields, croplands, freshwater ponds and wetlands, coastal wetland impoundments, and Delaware Bay shoreline. Although the Ted Harvey Conservation Area is not included in DNERR's designated boundaries, it is available for use in DNERR research and educational activities through cooperative arrangements with the Division of Fish and Wildlife. On its far eastern end, the St. Jones component contains about 2,560 acres of Delaware Bay bottom and nearshore waters that run for two miles along the Ted Harvey Conservation Area's bay shoreline and extend outward two miles into open Delaware Bay.

Robert's Tract, a 176-acre parcel of the Little Creek State Wildlife Area owned by the Division of Fish and Wildlife, borders the St. Jones component along its western end. In conjunction with the Ted Harvey Conservation Area, the Roberts Tract provides conservation-oriented land ownership on both upstream and downstream ends of the St. Jones component. Also located adjacent to the component's western border, the John Dickinson Plantation and Mansion is owned and managed by the Delaware Division of Historical and Cultural Affairs and provides another 262.8 acres of protected area within the reserve's designated boundaries.

The St. Jones River watershed has significant development in upstream nontidal areas where urbanized Dover dominates the upper and middle watershed. The Dover Air Force Base is also located near the St. Jones component. However, downstream portions of the St. Jones River watershed, including the area surrounding the St. Jones component, remain primarily agricultural.

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The more landward Blackbird Creek component, located approximately 20 miles northwest of the St. Jones component, consists of 1,180 acres distributed along 5.7 miles of low-salinity brackish or freshwater tidal creek, beginning approximately 5.8 miles upstream from where Blackbird Creek empties into the lower Delaware River. The Blackbird component contains 50 parcels of land held by 46 private landowners, DNERR, and the Division of Fish and Wildlife. Within the Blackbird component's designated boundaries, about 212 acres of tidal marshes, upland fields, woodlots and croplands were purchased by DNERR in 1990, but the majority of the component is still in private ownership. In 1996, the Division of Fish and Wildlife purchased an additional 183 acres of tidal marsh, woodlands, and croplands across Blackbird Creek and within the component's designated boundaries. The parcel was obtained as part of the Division's Cedar Swamp Wildlife Area and is available for use in DNERR activities.

Much of the expansive tidal marshes and uplands along Lower Blackbird Creek, downstream of the Blackbird component's designated boundaries, are owned and managed by the Division of Fish and Wildlife. This area primarily consists of a large parcel known as "The Rocks," which is also part of the Cedar Swamp State Wildlife Area. Extensive forested wetlands containing unique coastal plain ponds are located upstream of the component in nontidal areas. Much of the wetlands are within Blackbird State Forest, which is owned and managed by the Delaware Department of Agriculture's Forestry Section. Blackbird Creek's watershed is still primarily agricultural and forested, although low-density residential development is increasing.

B. RESERVE ADMINISTRATION

NOAA designated DNERR in 1993 as the 22nd reserve in the National Estuarine Research Reserve System. DNREC manages DNERR, and the primary administrative and many program functions are performed by the Delaware Coastal Programs in DNREC's Division of Soil and Water Conservation, which also administers DCMP.

At the state level, the reserve partners with staff from several other DNREC divisions for various functions. The Division of Fish and Wildlife assists with research, education, site surveillance and enforcement. The Division of Parks and Recreation supports land acquisition and oversight for construction project development and design. DNERR works with the Division of Water Resources on water quality research issues and with the Office of the Secretary regarding public relations and education.

The goals and objectives of DNERR focus on estuarine research, environmental education and resource stewardship. DNERR's staff manage the reserve's component sites and focus on resource stewardship through a combination of estuarine research and environmental education programs. Estuarine research is conducted both within the reserve and throughout Delaware's coastal zone to address coastal management issues by providing sound information for decision-making. The reserve conducts estuarine education programs in order to provide information to the public for improved understanding of coastal resources and improved coastal stewardship. Resource protection and stewardship is achieved through acquiring key properties adjacent to the

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reserve that include marshland and upland buffers, establishing cooperative agreements with property owners and conducting conservation-oriented land management practices.

C. ACCOMPLISHMENTS, REVIEW FINDINGS AND RECOMMENDATIONS

1. Staff

Since the last evaluation, some progress has been made in DNERR staffing. All reserve staff are part of the DNREC Division of Soil and Water Conservation and are located in the same facility. The Reserve Manager is now completely state-funded. However, the Education Coordinator and the Research Coordinator are not supported by state funds.

DNERR #1 – PROGRAM SUGGESTION: NOAA strongly encourages state funding support for DNERR’s Education Coordinator and Research Coordinator.

The DNERR Education Coordinator must be commended for her work as Acting Manager. The Reserve Manager, a member of the National Guard, was abruptly called to active duty in May 2002. In his absence, the Education Coordinator immediately assumed the role of Acting Manager and quickly learned the attendant responsibilities. She has a strong vision for the reserve, demonstrates leadership and is doing an excellent job in all aspects. Additionally, NOAA commends both DNERR and DCMP staff for working diligently to close any remaining gaps in responsibilities and workload during the Reserve Manager’s absence.

2. Facilities

DNERR’s Environmental Education and Estuarine Research Center on the St. Jones component of the reserve is a premium facility. A “green building,” the facility features a geothermal heating and cooling system, a tertiary septic system, and native plant landscaping. The driveway from the main road to the facility is topped with crushed recycled concrete. The building includes a 100-person auditorium that converts into two 40-person classrooms, a 36-person wet lab, office space and storage space for field equipment. The building has significantly increased the visibility of DNERR by serving as a public education center and research facility that provides valuable resources and programs to a wide range of interested individuals including students, teachers, coastal decision-makers and researchers. During the evaluation site visit, several researchers noted that they have chosen to conduct research at DNERR because of the excellent facilities and staff support.

DNERR improved the Environmental Education and Estuarine Research Center during the evaluation period with the addition of interpretive exhibits. Outdoor exhibits include a tidal cycle panel, a weather station panel and a tertiary septic system panel. Indoor exhibits include a 100-gallon saltwater aquarium featuring Delaware Bay fishes, an interactive estuary quiz and faux marsh display, a research panel, a St. Jones watershed panel and an estuary ecosystem panel.

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The reserve is currently embarking on its next phase of construction with plans for a connection wing that will consist of a small meeting room, bathrooms with shower facilities, and offices that will double as sleeping quarters for visiting researchers. The wing will increase meeting space in the facility and will allow the reserve to host researchers and other visitors overnight. NOAA encourages DNERR's continued improvement of its excellent facility.

3. Reserve Components

As described in Section V-A, DNERR has two components, the St. Jones component and the Blackbird component. While the St. Jones component enjoys an excellent facility and ample public access, the Blackbird component currently lacks convenient access. Water access is available either through use of a private boat dock or through use of the Division of Fish and Wildlife's Public Boat Ramp along Blackbird Creek, approximately two to three miles south of the reserve boundary. Land access by foot is available by traversing approximately 40 yards of marshy area, but vehicular access crosses private property.

DNERR has made several efforts to increase access at the Blackbird component but has been hampered by a cumbersome and protracted land acquisition process that requires the reserve to work through DNREC's Division of Parks and Recreation. The lack of access restricts many opportunities to conduct both targeted research projects and education programs at the component. The ability to conduct research and monitor the Blackbird component has become especially critical due to development projects scheduled for the upper watershed. DNERR would like to monitor the new development and identify potential impacts to Blackbird Creek and surrounding habitats.

DNERR #2 - PROGRAM SUGGESTION: NOAA strongly encourages DNREC to explore options for expediting the land acquisition process and for gaining access to the Blackbird component. Until permanent access is obtained, DNERR should work with local landowners to determine their willingness to provide access for occasional, short-term events. This approach could be explained at a "town meeting" with the neighboring landowners to address any questions and concerns as well as to explain DNERR's mission as a nonregulatory program that provides coastal management information and training. DNERR should also work with local land trusts and other land acquisition groups, such as The Nature Conservancy, that have expressed interest in acquiring lands within the reserve boundary.

In addition to the lack of public access at Blackbird Creek, the reserve boundary arrangements and agreements with private landowners are unclear both to NOAA and to the general public. Lands within National Estuarine Research Reserves must be protected in perpetuity. Given the numerous private landholdings that constitute the Blackbird Creek component, it is important that the exact arrangements made between the state and private landowners to ensure reserve program implementation are detailed in DNERR's management plan.

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DNERR #3 - PROGRAM SUGGESTION: NOAA strongly encourages DNERR to detail all boundary and property arrangements between Delaware and landowners related to the Blackbird Creek and St. Jones components in the reserve's revised management plan (2002-2007), with particular attention to arrangements with private property owners in the Blackbird Creek component. Copies of all Memoranda of Understanding should be included.

One of the issues that the evaluation team explored at length during the site visit was the degree to which DNERR's two sites are representative of significant coastal management issues in Delaware. There is a sense among both resource managers and researchers that the most pressing coastal issues in the state are found in Delaware's Inland Bays. Consequently, much of DNERR's research during the review period was conducted in and around the Inland Bays, despite the fact that the reserve has no component there. Past efforts to establish a DNERR component in the vicinity of the Inland Bays met with local resistance and a lack of agency commitment. Establishment of another component in southern Delaware would make DNERR more representative of the key coastal issues in the state as well as representative of the entire spectrum of habitats found along Delaware Bay. Even a small southern component would enhance and expand DNERR's research opportunities and objectives.

4. Visibility

DNERR's visibility has increased significantly during the evaluation period. Key staff positions, the Environmental Education and Estuarine Research Center and DNERR's core programs have all contributed to the reserve's improved visibility. In particular, DNERR's Education Program has done a great deal to raise awareness of the reserve among school groups through innovative, guided activities and workshops such as "Green Eggs and Sand." Further discussion of DNERR's Education Program, including the "Green Eggs and Sand" workshop, is provided in Section V-C-6. DNERR, with assistance from DCMP, has also increased its visibility by expanding its newsletter, website, press releases and mailing list.

DNERR's Research Coordinator has worked to increase visibility among local academic institutions and public agencies. He has formed stronger ties with Delaware State University during the last two years and has creatively expanded awareness of reserve research opportunities to programs other than oceanography and marine studies. As a result, there has been an increase in university classes conducting fieldwork at the reserve on a regular basis. The new Environmental Cooperative Science Center, which created a relationship between Delaware State University and DNERR, has the potential to enhance work between the two institutions.

NOAA commends DNERR for increasing its visibility during the evaluation period and encourages it to continue such efforts. Developing and maintaining a strong, individual program identity will help to heighten the reserve's visibility. DNERR might invite staff from another NERR to participate in a Coastal Decision-maker Workshop to emphasize that reserves are located throughout the country, have the same mission and often address

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similar issues. DNERR could consider strengthening its relationship with a local newspaper, radio station or television station that might run information about education programs, research projects and upcoming events at the reserve. In keeping with the NERRS Communications Plan and priority on raising the visibility of the reserve system nationally, it would be beneficial for Delaware to refer to DNERR as the “Delaware National Estuarine Research Reserve” rather than the “St. Jones Reserve,” as it is currently known, particularly on all public materials.

DNERR #4 - PROGRAM SUGGESTION: DNERR should continue to strengthen its visibility and identity as part of the NERRS within DNREC, nationally and among researchers, educators and the general public.

5. Management Plan

Reserve management plans are used to guide reserve operations and to provide the basic framework for all reserve activities, including research, monitoring, education, and outreach. NERRS regulations call for management plans to be updated every five years. During the evaluation period, DNERR has worked extensively to update its management plan and has made great progress. Revision of the management plan began in 2000, and DNERR formed an advisory committee in 2001 to assist with the revision. The committee initially met as a whole. Subsequently, management, research and education subcommittees met with regard to each section of the plan. In addition, the Reserve Manager and Acting Manager worked closely with NOAA during the revision process. A technical writer has reviewed the draft, which is near completion. NOAA commends DNERR for this effort. DNERR should continue to work with NOAA to complete a final management plan.

6. Education Program

DNERR’s Education Program has grown significantly during the evaluation period. The goal of the program is to increase environmental ethics among coastal resource users. The Education Program translates research into an effective format for coastal decision-makers and others, and thus provides a critical link between research, management, and education. NOAA commends DNERR on its excellent Education Program and encourages continuation of the program’s strong creative learning experiences and partnerships.

On-site education is conducted at the St. Jones component, and 5,000 to 6,000 children visit the reserve annually. The Education Program targets middle school students, but also offers K-12 programs, which are the reserve’s most well-known programs, as well as adult education programs. DNERR provides field trip experiences and outreach programs that correlate with state content standards and performance indicators in math, science, social studies and language arts. Revisions to the programs to correlate with national teaching standards is underway. One of the strongest components of DNERR’s education program is the “Green Eggs and Sand” workshop that educates participants about horseshoe crabs, their spawning habits along the coast of Delaware Bay and

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shorebird populations that depend on horseshoe crab eggs for food. The workshop translates research and management into a curriculum for middle school and high school students and has trained more than 250 teachers from eight states and Argentina. “Green Eggs and Sand” is jointly funded with federal sport fish restoration money through Delaware, New Jersey and Maryland Aquatic Resource Education Programs. The partnerships created in the development of Green Eggs and Sand demonstrate both the success of the Education Program in the community and the reserve’s status as a respected environmental education provider and leader in Delaware. Other school programs offered by the reserve have covered topics such as watersheds, ecology, wetland biology and policy and environmental careers.

DNERR hosts a variety of public programs ranging from boat trips along the St. Jones River to interpretive events. Pre-school naturalist programs, bird watching programs, nature walks and microscope labs are all popular public education activities. DNERR also participates in events such as Delaware’s Annual Coast Day, the Envirothon and the Delaware Water Festival.

Coastal Decision-maker Workshops (CDMW) and the Coastal Training Program (CTP) are important aspects of DNERR’s Education Program that provide current environmental information to decision-makers. The CDMWs have proven to be highly effective in conveying scientific information about priority environmental issues to government officials, policy-makers, and the public. One coastal decision-maker workshop held by the reserve, “Energy for the Next Decade,” resulted in a Delaware Senate Joint Resolution. Participants included state lawmakers, cabinet secretaries, and other energy policy stakeholders. After participating in the workshop, Senator Venables introduced Senate Joint Resolution #5. This Joint Resolution directs the Public Services Commission to investigate, review, and analyze Delaware’s available energy supply and potential energy needs and to prepare a report for the General Assembly identifying systemic changes that may be necessary and suggesting legislative action that can address those changes. To complete this task, the Commission is directed to consult with U.S. Geological Survey, the Delaware Geological Survey, and such other agencies or organizations as necessary to fully inform the Commission of the variables involved with energy supply and consumption in Delaware. The resolution was introduced approximately one month after the workshop was held, and the Delaware Coastal Programs Administrator and Senator Venables worked together closely on the matter.

DNERR has offered other timely and interesting CDMWs such as:

- The RoxAnn Seabed Classification System for Resource Management – held in conjunction with DCMP. This three-day workshop included a lecture, practical hands-on experience with the software, data collection in the field and interaction with system users. Fifteen participants from Maine, Maryland, Delaware, South Carolina, West Virginia and Washington, D.C. representing a variety of state and federal agencies attended the workshop;

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- Navigating in Rough Seas: Public Issues and Conflict Management – held in conjunction with NOAA’s Coastal Services Center. Twenty-two coastal extension, education and management professionals attended the workshop; and
- Smart Growth: Issues in the St. Jones Watershed – Three guest speakers gave presentations about wise land use. The workshop ended with helicopter tours to compare and contrast various land use practices in the watershed. Sixteen members of the Kent County Levy Court and Planning commission attended the workshop.

DNERR has demonstrated a strong interest in participating in the NERRS CTP and, along with the majority of reserves, accessed FY01 federal funding to support an intensive program planning and development process. The CTP is designed to inform decision-making to improve coastal stewardship at local and regional levels by increasing the application of science-based knowledge and skills by local and regional coastal decision-makers, and to increase dialogue and collaboration among these decision-makers. Planning for the program includes establishing a training advisory committee, conducting a market survey of training providers and an audience needs assessment, developing a program strategy that outlines priority coastal issues to be addressed during the next three to five years, and prioritizing audiences the reserve plans to target around these issues with relevant programs, as well as a marketing plan. The CTP is a new program that will build upon the success and experience of the Coastal Decision-maker Workshops.

Unfortunately, DNERR was unable to identify sufficient state match funds to access FY02 NOAA federal funds for launching the DNERR Coastal Training Program. Additionally, the reserve has been unable to hire additional staff to fully develop the program. In light of these funding and staffing constraints, DNERR should develop a long term management strategy for the necessary recruitment of staff and state matching funds in order to launch the program, following this intensive planning process. The planning process itself raises expectations and interest on the part of potential training partners and collaborators, and it is important to build on this interest and momentum.

<p>DNERR #5 - PROGRAM SUGGESTION: DNERR should develop a long-term management strategy for transitioning the CDMW program into a robust and strategic Coastal Training Program.</p>
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DNERR also has an active volunteer organization, “The Friends of the St. Jones Reserve,” which was founded in October 2000. The organization generally meets monthly and has adopted a highway, assisted with horseshoe crab spawning surveys, and hosted “Breakfast with the Birds.” The reserve hosts events for the organization, including guest lectures, meetings and receptions. DNERR is also successfully recruiting new volunteers, and NOAA encourages DNERR to continue these efforts. Options such as involving a local high school class in data collection should be explored. DNERR might form a partnership with a local university in which students conduct independent

studies at the reserve. Local university students might also visit the reserve several times a week to assist with experiments or to lead school groups through lab exercises.

7. Research and Monitoring Program

NOAA recognizes DNERR's Research and Monitoring Program for the progress it has made during the evaluation period. The program conducts estuarine monitoring, sponsors a graduate fellowship program and assists DCMP in developing management strategies through targeted research on a wide variety of coastal issues. The program addresses important coastal management issues in Delaware, has high credibility and is respected. DNERR's research has been very responsive to the needs of resource managers and coastal decision-makers and will address additional coastal management issues through research during the next five years. Key partnerships throughout the research and management communities also are an important aspect of the program. For example, DNERR's partnership with DCMP to study horseshoe crabs and shorebirds has increased the reserve's visibility and credibility within the state research and natural resource communities.

Participation and contribution to system-wide efforts (planning, development and implementation) is an important aspect of being part of the NERRS. National programs and initiatives are developed in a collaborative manner with the participation and input of all reserves and NOAA. One example of a system-wide effort is the National System-wide Monitoring Program (SWMP). The goal of SWMP is to identify and track short-term variability and long-term changes in estuarine water quality, habitat and land use in each reserve. The data gathered through SWMP provides information about how estuaries function and change over time, enabling scientists to predict how these systems will respond to anthropogenic changes. The St. Jones component has three dataloggers, and the Blackbird component has two dataloggers regularly recording information. Each DNERR component has a weather station. After data is downloaded, it undergoes quality control and is sent to the Central Data Management Office. DNERR's SWMP was one of the first in the country to begin sampling for nutrients and chlorophyll-a. Sampling occurs in both urban and rural locations. DNERR also takes monthly grab samples at each datalogger location, and a complete tidal cycle is sampled monthly in one location at two-hour intervals using an automated sampler.

DNERR's Research Coordinator has been an active member in developing system-wide research efforts. He has assisted other reserves that are installing weather stations with set-up and troubleshooting. He will also conduct a training session for the operation of weather stations for NERRS research and SWMP staff at the Central Data Management Office Technical Training Workshop. Additionally, DNERR hosted the 2003 Research Coordinators meeting.

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DNERR also conducts and supports many research projects throughout Delaware. Examples include:

St. Jones River and Blackbird Creek Watersheds

- Atmospheric Deposition of Nutrients
- Development Pressures on Blackbird Creek
- St. Jones Total Maximum Daily Load Development
- Stormwater Nutrient Runoff
- Stormwater Forebay Monitoring

Delaware Inland Bays

- Aerial Photography of Rehoboth Bay
- Development, Calibration, and Analysis of a Hydrological and Water Quality Model of the Delaware Inland Bays Watershed
- Evaluation of Aeration as a Method for Improving the Ecological Condition of Dead-end Canals
- Evaluation of Torquay Canal to Determine Causes of Fish Kills in the Area
- Indian River Inlet Marina Benthic Habitat Characterization
- Quantification of the Spatial Extent of Submerged Aquatic Vegetation in Delaware's Inland Bays
- RoxAnn Seabed Classification System Survey

Delaware Bay and Atlantic Coast

- Application of Underwater Acoustics to Determine the Effect of Beach Restoration on Nearshore Habitat, Distribution, and Movement of Spawning Horseshoe Crabs
- Atlantic Coast Borrow Site Benthic Habitat Characterization
- Beach Replenishment for Horseshoe Crab Spawning
- Horseshoe Crab Spawning Research
- Migratory Shorebirds

Other Locations

- Development of Environmental Indicators for the Coastal Zone
- Murderkill River Total Maximum Daily Load Implementation

Regional Research

- Atmospheric Deposition of Pesticides
- Regional Demonstration of the Impacts of Best Management Practices on Nonpoint Source Pollution of Coastal Waters

DNERR's ability to conduct and support applied research throughout Delaware is commendable. However, the mission of each reserve is to serve as a protected area for long-term estuarine research, education and interpretation. In essence, each reserve is a "living laboratory" in which scientists conduct research and educators communicate

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research results. Therefore, NOAA strongly encourages DNERR to balance research conducted off-site with research conducted within the reserve's two components.

DNERR #6 - PROGRAM SUGGESTION: NOAA strongly encourages DNERR to strengthen research conducted at the reserve. DNERR staff should develop a list of potential research questions relevant to coastal management issues that need to be addressed within the reserve and its watersheds that could be provided to local colleges and universities. NOAA also strongly encourages the Research Coordinator to look for creative sources of outside funding to increase research conducted at the reserve. Instead of limiting research projects on the reserve mainly to those which the Research Coordinator has time to conduct, DNERR could seek outside sources of research funding and additional incentives for other researchers to conduct studies at the reserve.

As described in Section V-C-4, DNERR's Research Coordinator has made significant progress during the last two years enhancing the visibility of DNERR's Research and Monitoring Program, particularly with academic institutions, and such efforts should continue. Nevertheless, NOAA has concerns about the priorities and visibility of the DNERR research program. One of NOAA's key concerns is the Research Coordinator arrangement in which half of the position is devoted to DCMP research and half of the position is devoted to DNERR research. In the 50 percent of his time that is devoted to the reserve, the Research Coordinator is struggling to balance site specific research and system-wide obligations, both important elements of a NERRS Research Coordinator. NOAA will address these concerns through Program Suggestion DNERR #6 at this time, but will monitor the Research Coordinator arrangement during the next three years to determine if DNERR research needs are being met. NOAA hopes that DNREC and DCMP will support DNERR's efforts to build a robust reserve research program and to attain a Research Coordinator that is devoted to reserve research.

NOAA is pleased that DNERR has promoted the Research and Monitoring Program to university professors and students in such diverse disciplines as geography, bioresources engineering, agricultural sciences, natural sciences, marine policy, physical ocean science and engineering, marine biology, and biochemistry. In an effort to expand research visibility further, DNERR might consider promoting reserve research opportunities to academic disciplines such as economics and urban planning. Professors and students in these fields may be interested in working on a variety of issues, including economic valuation, recreation, coastal tourism and open space, and growth management. Many of the evaluation site visit participants identified resource management issues they believe would be appropriate for DNERR to incorporate in its research agenda due to existing information gaps, as well as the reserve location, staff expertise, facilities, and environment. Management issues include:

- Land use and resultant environmental impacts
- Growth management
- Coastal nonpoint pollution (stormwater, residential, agricultural)
- Horseshoe crabs and shorebirds (continuation of current work)
- Benthic assessments

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- Biodiversity
- Mosquito control and non-target impacts
- Agricultural best management practices demonstration plots
- *Phragmites* control and eradication practices
- Wildlife management
- Noise pollution and impacts on wildlife
- Sea level rise

The NERRS Graduate Research Fellowship Program offers two qualified advanced degree students per year at each reserve the opportunity to address scientific questions of local, regional and national significance. The fellows receive hands-on experience while providing reserve managers and coastal decision-makers with vital ecological information. During the last cycle of Graduate Research Fellowship applications, only two applications were received for the two fellowships available at DNERR. However, interest in DNERR's Graduate Research Fellowships has been increasing. NOAA encourages DNERR to continue to enhance promotion of the Graduate Research Fellowship Program.

8. Community Partnerships

DNERR continues to form valuable and effective partnerships with many nongovernmental organizations in the community, including the Delaware Museum of Natural History, the Delaware Native Plant Society and The Nature Conservancy. The Delaware Native Plant Society is working with DNERR to restore native plants in the Blackbird component. The society also has a native plant nursery designated at the St. Jones component. This nursery provides a tool for outreach and education where the public, including coastal decision-makers, can view and identify native plants, learn about the importance and benefits of using native plants and purchase native plants. NOAA commends DNERR's efforts to foster community partnerships.

VI. CONCLUSION

Based upon the recent evaluation of DCMP and DNERR, I find that Delaware is adhering: (1) to its approved Coastal Management Program and is making satisfactory progress implementing the provisions of its approved Coastal Management Program; and (2) to the programmatic requirements of the NERRS in its operation of its approved National Estuarine Research Reserve.

These evaluation findings contain 12 recommendations. These recommendations are Program Suggestions that DNREC should consider prior to the next §312 evaluation of DCMP and DNERR. Summary tables of program accomplishments and recommendations are provided in Appendices C and D.

This is a programmatic evaluation of DCMP and DNERR that may have implications regarding the state's financial assistance awards. However, it does not make any judgment on or replace any financial audits related to the allowability or allocability of any costs incurred.

Eldon Hout
Director

Date

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VI. APPENDICES

APPENDIX A. PERSONS AND INSTITUTIONS CONTACTED

Delaware Coastal Programs Representatives

Name	Title	Affiliation
Dave Carter	Environmental Program Manager	DCMP
Kim Cole	Environmental Scientist	DCMP
Wes Conley	Conservationist	DNERR
Sarah Cooksey	Program Administrator	DCMP and DNERR
Tricia Cosbey	Environmental Scientist	DCMP
Lonnie Dye	Application Support Specialist	DCMP
Pat Hoffman	Administrative Specialist	DCMP
Katy Lamborn	Acting Manager and Education Coordinator	DNERR
Susan Love	Planner	DCMP
Tim Lucas	Environmental Scientist	DCMP
Kate Marvel	Estuarine Educator	DNERR
Mike Mensinger	Research Technician	DNERR
Rico Santiago	Environmental Scientist	DCMP
Bob Scarborough	Research Coordinator	DCMP and DNERR
Richard Weber	Associate Scientist	DNERR
Bonnie Willis	NOAA Coastal Management Fellow	DCMP
Carl Yetter	Environmental Engineer	DCMP

State of Delaware Representatives

Name	Title	Affiliation
Dennis Brown	Coastal Zone Act Administrator	DNREC Office of the Secretary
Phil Cherry	Program Administrator	DNREC Office of the Secretary, Policy and Planning
Nicholas DiPasquale	Secretary	DNREC Office of the Secretary
Sherry Evans-Stanton	Biodiversity	DNREC Office of the Secretary
Jim Poling	Brownfields Coordinator	DNREC Air and Waste, Site Investigation and Restoration
Bob Zimmerman	Program Administrator	DNREC Office of the Secretary
Mike Brown	Environmental Program Manager	DNREC Soil and Water Conservation, Nonpoint Source Program
Bob Henry	Administrator	DNREC Soil and Water Conservation, Shoreline and Waterway Management
John Hughes	Director	DNREC Soil and Water Conservation

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Jenny McDermott	Environmental Scientist	DNREC Soil and Water Conservation, Nonpoint Source Program
Frank Piorko	Environmental Program Manager	DNREC Soil and Water Conservation, Sediment and Stormwater Management
Tony Pratt	Environmental Program Manager	DNREC Soil and Water Conservation, Shoreline Management
Katharine Bunting-Howarth	Planner	DNREC Water Resources, Watershed Assessment
Kevin Donnelly	Director	DNREC Water Resources
Laura Herr	Environmental Program Manager	DNREC Water Resources, Wetlands and Subaqueous Lands
John Kennel	Planner	DNREC Water Resources
Bill Moyer	Environmental Program Manager	DNREC Water Resources, Wetlands and Subaqueous Lands
Karen Bennett	Environmental Program Manager	DNREC Fish and Wildlife, Natural Heritage Program
John Clark	Environmental Scientist	DNREC Fish and Wildlife
Gary Kreamer	Training/Education Administrator	DNREC Fish and Wildlife, Aquatic Resource Education Center
Bill Meredith	Administrator	DNREC Fish and Wildlife, Mosquito Control Section
Jeff Tinsman	Environmental Scientist	DNREC Fish and Wildlife, Fisheries Section
Wayne Rust	Construction Project Manager	DNREC Parks and Recreation
Michael Mahaffie	Principal Planner	Office of State Planning

Federal Agency Representatives

Name	Title	Affiliation
Tim Goodger		NOAA National Marine Fisheries Service
Paul Petrichenko		USDA Natural Resources Conservation Service
Greg Breese		DOI Fish and Wildlife Service
Mike Haramis		DOI Geological Survey
Barnett Rattner		DOI Geological Survey
Steve Allen		USACE Philadelphia District
John Brundage		USACE Philadelphia District

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Local Government Representatives

Name	Title	Affiliation
Carl Solberg	Assistant Director, Community Services/Parks Division	Kent County Parks and Kent County Levy Court
John Gysling	New Castle County Land Use/Engineering	New Castle County
Paula Marselli	New Castle County Community Governing	New Castle County

Academic Representatives

Name	Title	Affiliation
Michael Reiter	Associate Professor of Natural Resources	Delaware State University
Richard Field		University of Delaware College of Marine Studies
Vic Klemas	Professor of Marine Studies	University of Delaware College of Marine Studies
George Luther	Professor of Marine Studies	University of Delaware College of Marine Studies
Alex Parker	DNERR Graduate Research Fellow	University of Delaware College of Marine Studies
John Madsen	Associate Professor of Geology	University of Delaware Department of Geology
Bartholomew Wilson	DNERR Graduate Research Fellow	University of Delaware Department of Geology
Bill Ritter	Professor of Bioresources Engineering	University of Delaware Department of Bioresources Engineering
Jim Falk	Director	Delaware Sea Grant
Joe Farrell	Marine Resource Management Specialist	Delaware Sea Grant Marine Advisory Service

NGO Representatives

Name	Title	Affiliation
Andy Manus		Ducks Unlimited
Keith Clancy	President	Delaware Native Plants Society
Dick Fleming		Delaware Nature Society
Gene Hess		Delaware Museum of Natural History
Maria Trabka	Delaware Bayshores Project Director	The Nature Conservancy

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Peggy John		Delaware Audubon Society
Ann Rydgren		Delaware Audubon Society
Bruce Richards	Executive Director	Delaware Center for the Inland Bays

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APPENDIX B. PERSONS ATTENDING THE PUBLIC MEETING

Name	Affiliation
Ernst Siemoncil	Private Citizen
Christine Waisanen	Delaware Coastal Zone Industrial Control Board
Susan Yost	Delaware State University

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APPENDIX C. SUMMARY TABLE OF ACCOMPLISHMENTS

Program	Issue Area	Accomplishment
DCMP DNERR	Staff	DCP staff must be recognized for their tireless work, responsiveness, perseverance, creativity and dedication to coastal management.
DCMP DNERR	Coordination and Collaboration	The combined efforts of DCMP and DNERR consistently yield high quality results. Both DCMP and DNERR have evolved and are clearly filling a resource management and technical assistance niche in Delaware.
DCMP	Delaware Coastal Nonpoint Program	Delaware became the ninth state to receive full approval for its Coastal Nonpoint Program.
DCMP	Federal Consistency	DCMP has made steady progress to improve the federal consistency review process during the evaluation period.
DCMP	Technical Assistance to Local Governments	DCMP provides excellent technical assistance to local governments. These efforts promote better planning by local governments and build valuable relationships for future partnerships.
DCMP	Environmental Indicators Initiative	DCMP has made great contributions to Delaware's environmental indicators development process.
DCMP	Pea Patch Island Heronry Region SAMP	DCMP led the development of the Pea Patch Island SAMP, which was a consensus based effort involving representatives from federal, state and local government agencies, nonprofit organizations, and industry.
DCMP	Statewide Dredging Policy Framework	DCMP led efforts to develop and implement the Statewide Dredging Policy Framework.
DNERR	Staff	The DNERR Education Coordinator must be commended for her work as Acting Manager. Additionally, both DNERR and DCMP staff have worked diligently to close any remaining gaps in responsibilities and workload during the Reserve Manager's absence.
DNERR	Facilities	DNERR improved the Environmental Education and Estuarine Research Center during the evaluation period.
DNERR	Visibility	DNERR's visibility has increased significantly during the evaluation period.
DNERR	Management Plan	DNERR has worked extensively to update its management plan and has made great progress during the evaluation period.
DNERR	Education Program	DNERR has an excellent Education Program.
DNERR	Research and Monitoring Program	DNERR's Research and Monitoring Program has made progress during the evaluation period.
DNERR	Community Partnerships	DNERR continues to form valuable and effective partnerships with many nongovernmental organizations in the community.

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APPENDIX D. SUMMARY TABLE OF PROGRAM SUGGESTIONS

Program	#	Program Suggestion
DCMP DNERR	1	NOAA strongly encourages DCMP and DNERR to maintain strong, individual identities. Also, each program should clearly define management staff roles and responsibilities. Administrative decision-making processes must involve appropriate management staff in major program decisions.
DCMP DNERR	2	Prior to grant submission, DCMP, DNERR, and NOAA should jointly discuss all annual grant tasks for both programs. It is important for the DCMP Manager, DNERR Manager, NOAA DCMP Liaison, and NOAA DNERR Liaison to develop grant proposals cooperatively prior to grant submission to NOAA. Specifically, the DCMP Manager, DNERR Manager, NOAA DCMP Liaison, and NOAA DNERR Liaison should identify grant tasks with crossover funding. They should also ensure that resource sharing is mutually beneficial and supports both individual and national program missions and goals.
DCMP DNERR	3	NOAA encourages DCMP and DNERR to continue to refine the objectives and goals for the implementation of the horseshoe crab and shorebird research and its application to management. Long-term management priorities and strategies should be clearly defined.
DCMP	1	NOAA encourages DCMP to continue improving the federal consistency process by strengthening current efforts, including: (1) targeted education and outreach to prospective applicants; and (2) coordination with DNREC's Division of Water Resources.
DCMP	2	NOAA encourages DCMP to expand the application of data and products generated by the environmental indicators process to coastal management. NOAA also urges DNREC to ensure use and refinement of the environmental indicators as an integral part of the effort to achieve the coastal zone environmental goals identified by the process.
DCMP	3	NOAA encourages DCMP to continue implementation of the Pea Patch Island Heronry Region SAMP. DCMP should coordinate the efforts of cooperating agencies, nongovernmental organizations and individuals to reevaluate their commitment to the SAMP, to outline the strategies that align with their programs' missions and goals, and to commit the resources needed to accomplish these strategies. DCMP should explore options to provide incentives to cooperating organizations, including outside funding such as a management plan implementation grant that could provide funds for additional staff to assist with implementation or for cooperating organizations to participate more fully.

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DNERR	1	NOAA strongly encourages state funding support for DNERR's Education Coordinator and Research Coordinator
DNERR	2	NOAA strongly encourages DNREC to explore options for expediting the land acquisition process and for gaining access to the Blackbird component. Until permanent access is obtained, DNERR should work with local landowners to determine their willingness to provide access for occasional, short-term events. This approach could be explained at a "town meeting" with the neighboring landowners to address any questions and concerns as well as to explain DNERR's mission as a nonregulatory program that provides coastal management information and training. DNERR should also work with local land trusts and other land acquisition groups, such as The Nature Conservancy, that have expressed interest in acquiring lands within the reserve boundary.
DNERR	3	NOAA strongly encourages DNERR to detail all boundary and property arrangements between Delaware and landowners related to the Blackbird Creek and St. Jones components in the reserve's revised management plan (2002-2007), with particular attention to arrangements with private property owners in the Blackbird Creek component. Copies of all Memoranda of Understanding should be included.
DNERR	4	DNERR should continue to strengthen its visibility and identity as part of the NERRS within DNREC, nationally, and among researchers, educators, and the general public.
DNERR	5	DNERR should develop a long-term management strategy for transitioning the CDMW program into a robust and strategic Coastal Training Program.
DNERR	6	NOAA strongly encourages DNERR to strengthen research conducted at the reserve. DNERR staff should develop a list of potential research questions relevant to coastal management issues that need to be addressed within the reserve and its watersheds that could be provided to local colleges and universities. NOAA also strongly encourages the Research Coordinator to look for creative sources of outside funding to increase research conducted at the reserve. Instead of limiting research projects on the reserve mainly to those which the Research Coordinator has time to conduct, DNERR could seek outside sources of research funding and additional incentives for other researchers to conduct studies at the reserve.