



**Maryland
Department of
Natural Resources**

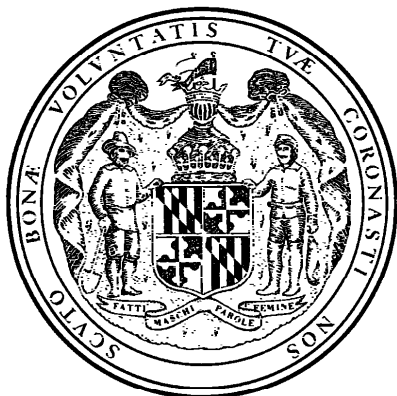
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**Annual
Activities
Report
1976**

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Maryland
Department of
Natural Resources

Annual
Activities Report
1976



STATE OF MARYLAND

Marvin Mandel
Governor

Louis L. Goldstein
Comptroller

William S. James
Treasurer

DEPARTMENT OF NATURAL RESOURCES

James B. Coulter
Secretary

Louis N. Phipps, Jr.
Deputy Secretary



JAMES B. COULTER
SECRETARY

STATE OF MARYLAND
DEPARTMENT OF NATURAL RESOURCES
TAWES STATE OFFICE BUILDING
ANNAPOLIS 21401

LOUIS N. PHIPPS, JR.
DEPUTY SECRETARY

January 12, 1977

The Honorable Marvin Mandel
Governor
State of Maryland
State House
Annapolis, Maryland 21401

Dear Governor Mandel:

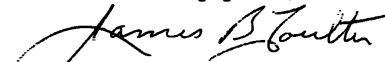
Attached is the Annual Activities Report describing programs and services of the Department of Natural Resources during Fiscal Year 1976.

With 1,426 employees, the Department is effectively managing the resources of the State in addition to rendering individual services to Marylanders and those who visit here.

Through departmental programs involving licensing and permits, the quality of the water is being improved and its quantities maintained, the productive wetlands of the State are being protected, a livelihood is being supplied to those citizens who work on the waters, and recreational opportunities are being afforded to those who enjoy the outdoors.

By means of other management opportunities, some of them new, the department is facing the problems of energy demand as well as the best possible use of our State's vast coastal zone resources.

Sincerely yours,

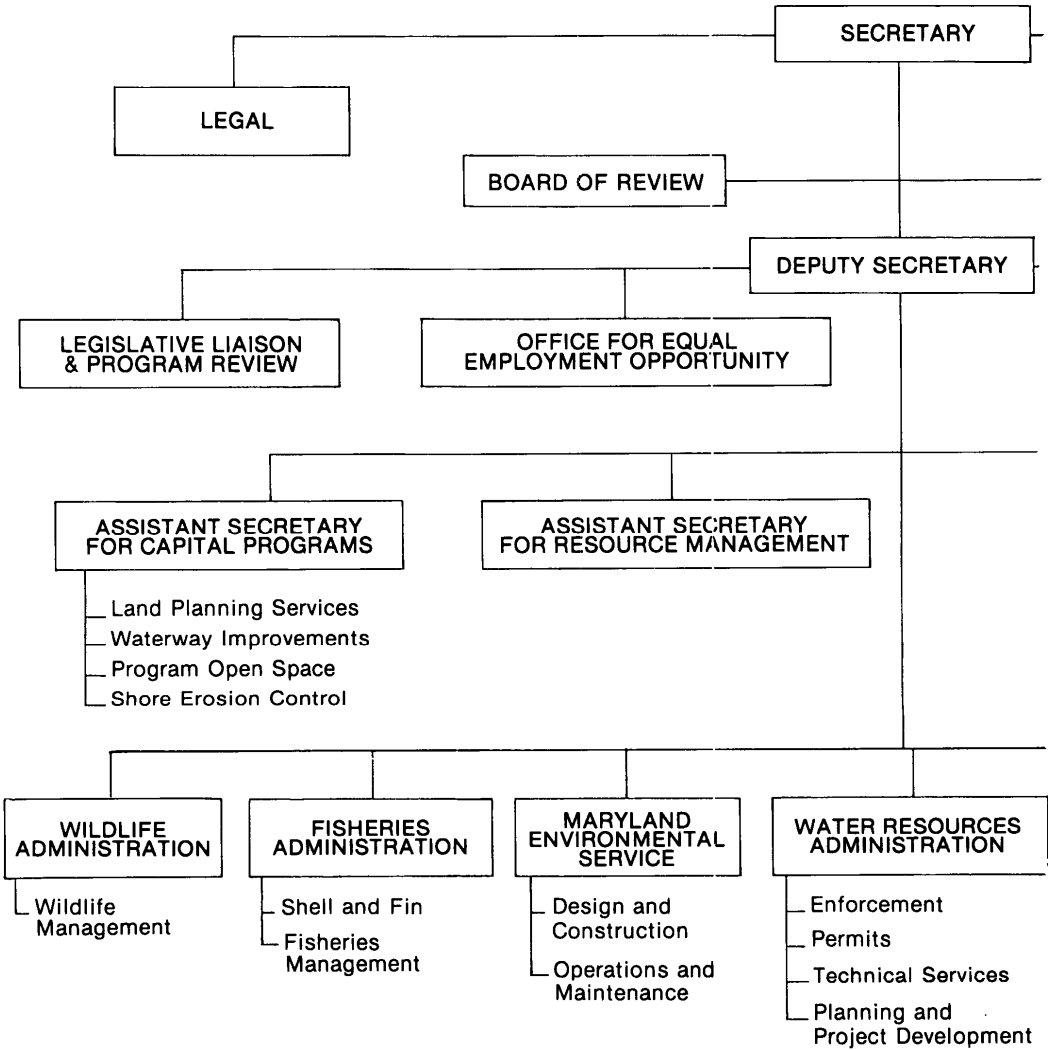

James B. Coulter
Secretary

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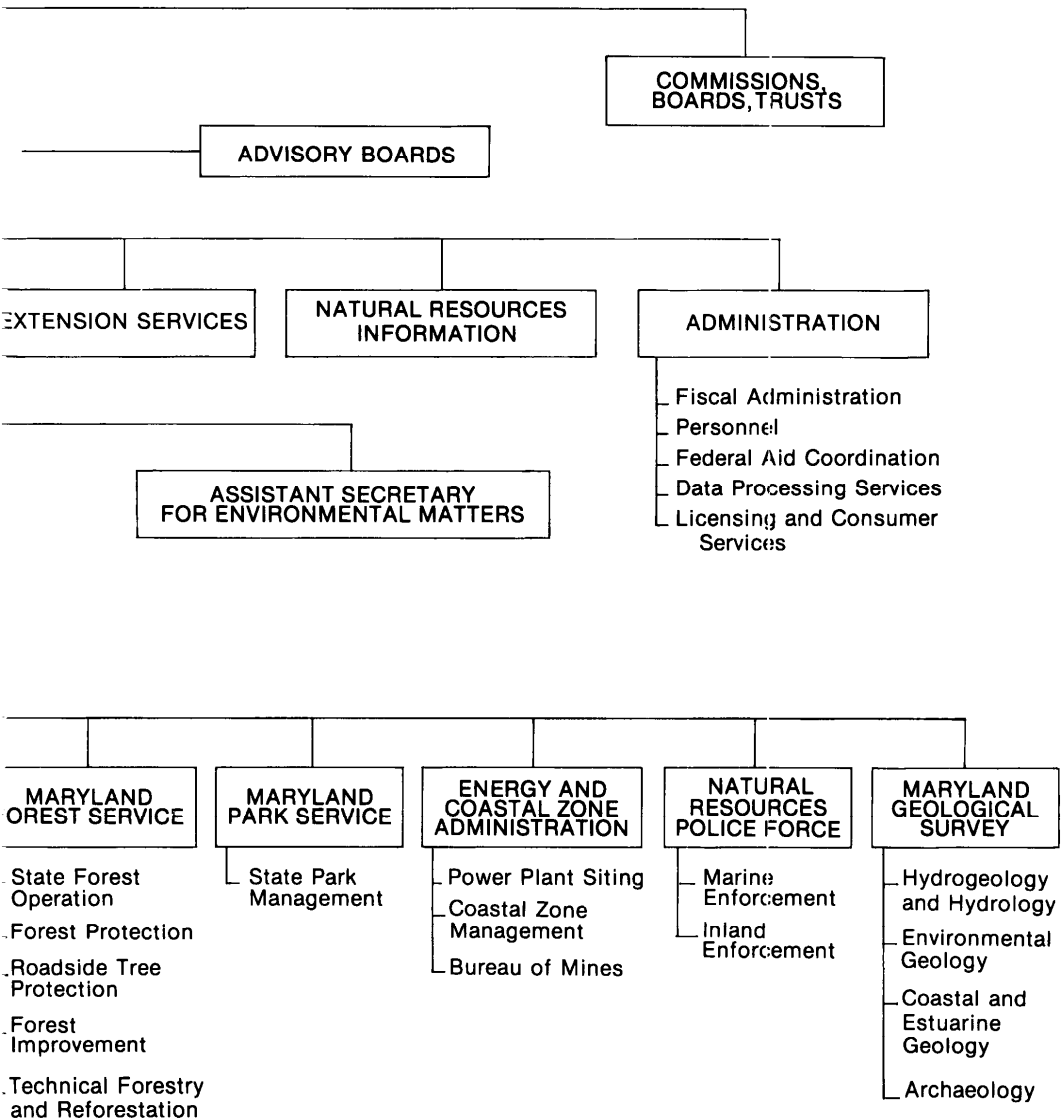
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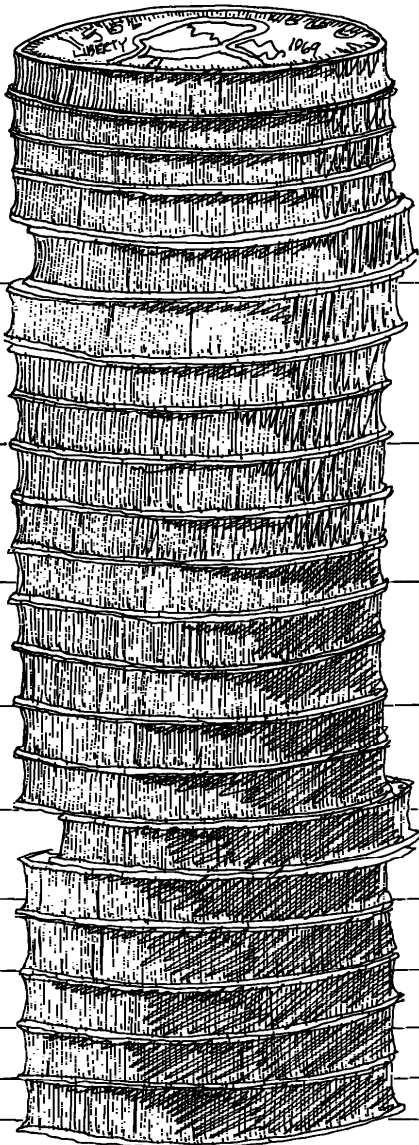


NATURAL RESOURCES



NATURAL RESOURCES

FY 1976 BUDGET \$36,997,483



Energy and Coastal Zone Administration	\$7,433,713	19.7%
Capital Programs Administration	5,172,299	13.7%
Maryland Park Service	5,031,675	13.3%
Natural Resources Police	4,060,377	10.7%
Water Resources Administration	3,495,678	9.2%
Fisheries Administration	3,342,652	8.8%
Maryland Forest Service	2,830,112	7.4%
Office of the Secretary	2,801,999	7.4%
Wildlife Administration	1,489,188	3.9%
Maryland Environmental Service	1,124,105	3.0%
Board of Well Drillers	27,269	.1%
Maryland Geological Survey	130,889	.4%
Maryland Environment Trust	57,527	.2%

Office of the Secretary

The Secretary of the Department of Natural Resources is responsible for establishment and implementation of policies governing management of the Natural Resources of the State of Maryland. The Secretary and the various management agencies of the Department receive advice and guidance from Boards and Commissions including the Advisory Board and the Board of Review.

The Assistant Secretary for Resource Management serves as Executive Secretary to the Board of Review. During Fiscal Year 1976 the Board of Review conducted 15 meetings, including a field inspection trip to Western Maryland. Meetings were held in Annapolis, Oxford, La Plata and Frenchtown, Somerset County. The Board conducted 11 hearings of contested cases and rendered opinions and orders in these cases.

The Assistant Secretary for Environmental Matters represents the Department in 13 major activities including the *Interstate Conference on Water Problems*, the *Susquehanna River Basin Commission*, the *Interstate Commission on the Potomac River Basin*, the *Ohio River Basin Commission* and the *Chesapeake Research Consortium*.

As the appointed alternate to the Governor on the *Susquehanna River Basin Commission* the Assistant Secretary hosted the early fall meeting of the Commission, which was conducted in Maryland.

In Fiscal Year 1976 there were 669 project reviews completed. Of that number, there were almost 50 Environmental Impact Statements (EIS) reviewed.

Through the Office of the Secretary policy direction and supportive services are provided to the operating agencies of the Department. Supportive services include fiscal administration, budget, purchasing, data processing, mail and duplicating service, auto maintenance and personnel. The authorized full time staff of the Department for Fiscal Year 1976 was 1424 positions.

Other services provided to the operating agencies include extension services, public information services, licensing and consumer services.

Extension Services

Technical advice and assistance are provided to the public to encourage wise use and proper management of the Natural Resources of the State of Maryland. Through this program the Department conducts a liaison with the boating public and a liaison with the Commercial Fisheries (through the publication of the *Commercial Fisheries News* — 30,000 distribution). The Extension Services produces motion pictures concerning a wide range of Natural Resources topics. These films are available on loan through the DNR Library.

The Extension Services lends assistance to the public in the area of Recreation and Leisure Services. The Save Our Streams program is administered.

Four extension agents work from the DNR Regional Centers and attend several hundred meetings a year. All Extension Services personnel are on call for lectures, symposia, and the showing of films and slides to groups and organizations.

Natural Resources Information

Natural Resources Information provides accurate and rapid dissemination of DNR information through the mass media to the interested public. Pamphlets, brochures, press releases of timely news and information are provided and distributed. The *Maryland Conservationist*, sold by subscription, reaches 5,000 readers, six times each year. A calendar of special events reaches approximately 1100 readers every month. A *Forestry Newsletter* and a *Fish and Wildlife Newsletter* are published by Natural Resources Information. 23,000 copies of *Fish and Wildlife Newsletter*

are distributed 6 times a year. An expanded library service is included in Natural Resources Information. In addition to books, pamphlets, periodicals and other documents the library includes nearly 50 NRI films for distribution to the general public.

Licensing and Consumer Services

Licensing and Consumer Services is responsible for administration of the State Boat Act. This section is responsible for the sale of the *Guide for Cruising Maryland Waters* and other Department publications.

The responsibility for the operation and management of the Department's five Regional Service Centers is in this program.

The program is responsible for the issuance of boat titles, hunting and fishing licenses, commercial fishing licenses and permits, collection of boat title tax, oyster severance and export tax, and clam severance and inspection tax. Responsibility for contracts with license distribution and agents (both consigned and cash) lies within this program.

Maryland Environmental Trust

A separate unit of the Department, the Maryland Environmental Trust promotes conservation, improvement, stimulation and perpetuation of the aesthetic, natural, health and welfare, scenic and cultural qualities of the environment, including but not limited to land, water, air, wildlife, scenic qualities, open space and buildings.

Capital Programs Administration

Under the Direction of the Assistant Secretary for Capital Programs, four major areas of work responsibility are being accomplished. These are Waterway Improvement, Shoreline Erosion Control, Department of Natural Resources Land Planning and Program Open Space.

The Capital Programs Administration helps individuals, local governments and counties to provide recreational and environmental areas and facilities, to clear waterways of debris, to provide shore side facilities for the boating public, to prevent erosion of land and consequent alteration of water quality. The fourth function of the Administration is long term planning for use of lands held by the Department of Natural Resources. Planning for parks, natural environmental areas, scenic and wild rivers is included in this activity.

Land Planning Services

This section performs the planning on Department of Natural Resources lands. Master planning for state parks consumes the major amount of time, although a growing area of emphasis is the development of environmental impact statements and basic land resource inventories.

All DNR land acquisition maps are planned and produced here. The planning involves the entire professional staff; map production is carried out by a group of four draftsmen.

The section is also responsible for the *Maryland Wild and Scenic Rivers Act*. One planner is assigned to this project full-time; other members of the staff and personnel from other units of the Department provide services to this program.

Substantial progress was made during Fiscal Year 1976 in park master planning. This was the first full year in which master planning was conducted entirely with Department personnel. Heretofore, consultant firms did the bulk of the planning work for most major parks. As a result of the

activities of the year, the park planning process is tested and stabilized, and is now well understood by various agencies of the Department and by interested segments of the general public.

Public involvement is a major emphasis of the park planning process. Nine park advisory committees have been established and are now active. During the past year, these committees held 65 meetings; all of which were open to the public. Fourteen public workshops, public meetings, and public hearings were held to present proposals of the Department and to receive and discuss the opinions of interested citizens. Beyond these formal sessions, the section made numerous presentations of park plans to interested community associations, conservation groups, and service organizations.

SANDY POINT STATE PARK A master plan was adopted for this park reflecting the first major plan revision since the park was established in 1950. The plan calls for refurbishing of the beach areas; an extensive trail and nature interpretive system; a new bay-side picnic area; and a major Bay interpretive center.

SUSQUEHANNA STATE PARK A draft master plan was completed for this riverside park. The plan calls for the upgrading of the existing recreation facilities, increasing emphasis on the natural and historical features of the park, and a farm-oriented interpretive center. The plan also proposes protection of the Susquehanna shoreline on both sides of the river and the establishment of a biking and hiking trail from Havre de Grace to the Conowingo Dam. A major accomplishment of the plan was the solution of complex access and circulation problems, with the proposal to establish an entirely new entrance road at the western end of the park.

ROSARYVILLE STATE PARK A draft master plan was completed for this new Prince George's County park. The plan calls for low key recreational development in a rural and historical setting. The natural farms-woodland pattern of land use will be retained, and the existing historical and cultural features highlighted. The plan when implemented will provide an essentially natural character in a rapidly urbanizing area.

GREENWELL STATE PARK A draft master plan was completed for Greenwell State Park on the lower Patuxent estuary in St. Mary's County. Greenwell is being planned to provide special services and facilities for handicapped persons, although the park will be open to all. The plan emphasizes the preservation of the waterfront and farm landscape. Facilities include a campground, a day-use area, a small boat area, two interpretive farms, and a sheltered overnight facility to be used primarily by handicapped groups.

PATAPSCO VALLEY STATE PARK Substantial progress was made in the planning for the park, which is by far the most heavily used park in the entire state park system. A major accomplishment was the review and expansion of the park acquisition line; with help from the Patapsco Advisory Committee. Field work for a detailed and systematic resources inventory of the Patapsco Valley will be completed in the summer of 1976. This will improve the quality and environmental sensitivity of the master plan which is scheduled for completion in mid-1977.

WILD AND SCENIC RIVERS PROGRAM Much of the work in the Wild and Scenic Rivers Program was devoted to the promulgation of rules and regulations for the wild segment of the Youghiogheny River. This controversial issue involved numerous advisory board meetings and two public hearings. The regulations were adopted in May, 1976, and are now in full effect. Work is now underway to augment the regulations with a plan and program as required by the *State Wild and Scenic Rivers Act*. Extensive field surveys were also conducted on the remaining rivers in the state system. These surveys, conducted largely by graduate students hired during the summer months, will provide the basis for plans for the other eight scenic rivers.

The Land Planning Services section also completed and transmitted to the appropriate management agencies its recommendations on potential wildlands areas in Western Maryland. The section recommended three areas in Savage River State Forest, one area in Rocky Gap State Park, and one area in Warrior Mountain Wildlife Management Area for possible inclusion into the State Wildlands System.

A state park camper user survey was conducted in Fiscal 1976. This survey will provide information that will tie directly to the planning of camping areas in the future.

The following list summarizes numerically the accomplishments of Land Planning Services in Fiscal Year 1976:

- One park master plan adopted
- Three draft master plans completed
- One park concept plan completed
- Detailed resources inventories for approximately 25,000 acres of stream valley park land (Patapsco and Gunpowder)
- Wild river regulations adopted on one wild river segment of the scenic rivers system
- Five scenic rivers field inventories completed
- Twelve new acquisition line maps completed; twenty-eight other acquisition maps were revised and upgraded.

Shore Erosion Control

During FY 76 this program has been responsible for processing 204 applications for assistance. Forty projects have been completed serving 254 individual property owners. A total of 2.43 miles or 12,813 feet of shore line has been protected using timber, stone, aluminum, or steel.

State Loan funds expended:	\$1,302,961
Dorchester	117,886.
Queen Anne	100,576.
Talbot	85,094.
Worcester	443,439.
Wicomico	23,101.
Anne Arundel	225,799.
Calvert	156,824.
Charles	20,050.
Prince George's	121,567.
St. Mary's	8,625.

Waterway Improvements

This program is responsible for the improvement of State waterways for public benefit, through these programs.

1. The **Waterway Grants Division** is responsible for recreational development of the Chesapeake Bay. In Fiscal Year 1976 this Division approved 62 projects and disbursed \$397,387 for completed projects. One hundred thirty-three projects are incomplete with an obligated fund value of \$6,840,039. Ninety-three of these projects are presently under construction with a fund obligation of \$5,461,479. In FY 76, 24 projects were completed, consisting of facility improvements, launching ramps, bulkheading and piers. Since the inception of the Waterway Improvement Program, this Division has completed 458 projects with an expended total value of \$2,493,682.

2. The **Dredging Division** is responsible for dredging of channels and harbors and the construction of jetties and breakwaters pursuant to the provisions of the State Boat Act. Approved projects are financed through the Waterway Improvement Fund.

In Fiscal Year 1976, the Dredging Division completed six projects at a total cost of \$983,079. At the end of FY 76, this division had 21 projects in progress for a total obligation of \$2,276,000.

3. The **Marine Service Operations Division** is responsible for general waterway maintenance in channels, harbors and areas that are not maintained by the U.S. Corps of Engineers. Activities include the removal of debris and derelict vessels from the Chesapeake Bay and tributaries; installation of daymarker piles used as aids to navigation; the repair and maintenance of various public-owned facilities such as piers, bulkheads, launching ramps, and small dredging operations.

In Fiscal Year 1976, \$191,214 was expended for the removal of 358 derelict vessels, 974 pilings and other debris from the waters of the State.

4. The **Hydrographic Operations Division** provides hydrographic survey engineering services in support of the Department of Natural Resources Fisheries Administration. In Fiscal Year 1976, the hydrographic associates assisted the Fisheries Administration in charting the location and determining the acreage of 130 oyster planting areas covering 1075 acres for seed, 1092 acres for dredged shell, and 325 acres for fresh shell; representing a total of 2492 acres surveyed. 1100 acres of public oyster grounds were surveyed and reclassified as soft shell clamming ground. The oyster bar charts were amended to reflect these changes.

Approximately 1000 floating regulatory buoys and navigation aids were established and 185 fixed aids to navigation were maintained.

The Raydist "T" electronic positioning system has been thoroughly tested and accepted this year. The Raydist positioning system has made possible the sampling of a total of 43,609 acres at the year's end by personnel aboard the three Bay Bottom Survey boats. Raydist has also been used in the placement of about 50% of all floating aids to navigation and regulatory buoys installed this year.

Program Open Space

Program Open Space was initiated by the General Assembly in 1969 to provide funds for the acquisition and development of open space areas.

Funds are appropriated by the General Assembly for the acquisition of land and development of recreational facilities, at both the state and local level. The fund sources for this appropriation are a bond authorization and the collection of a tax in the transfer of all real property within the state.

The local subdivisions, through fiscal year 1976, have appropriated \$74,550,000 of which \$64,587,629 has been approved by the Board of Public Works for local projects. The types of projects range from small tot lots in urban areas to large regional parks in rural areas. In many cases

Program Open Space involves the acquisition of acreage to be kept in a "land bank" for use by future generations.

To date the local subdivisions have submitted some 1,030 projects, and as a result of projects completed during fiscal year 1976, \$6,811,419 was returned to the subdivisions.

In fiscal year 1976, 15,371 acres were acquired for use by this department. Of that amount, 2,693 acres were acquired for parks, 982 acres for forests, 1,105 acres for wildlife management, 4,283 acres for natural environment areas, 58 acres for fish management and 6,250 acres for natural resources management. Also, during this time period, design was begun on eight projects and construction on seventeen projects.

Maryland Park Service

The Maryland Park Service is made up of people serving people in recreational settings. Services provided consist of the supervision and control of activities such as swimming, camping, picnicking, hiking, fishing and boating. Interpretive programs and special activities and events encourage involvement of park visitors. The enforcement of rules and regulations promulgated for the protection and safety of park visitors, the facilities and natural resources of the park are an important function of park service personnel, as is providing information and assistance to park visitors.

The facilities for picnicking, swimming and hiking were those most utilized by park visitors. Picnicking areas are available in all developed state parks while hiking facilities are available in most areas. There are 13 parks with swimming facilities. New camping areas at Tuckahoe, Susquehanna and Greenbrier began their first full season of operation during the year. Interpretive programs were begun at Gambrill and Sandy Point state parks increasing the number of parks offering these programs to 25.

Educational, work experience and recreational programs are also available to park visitors. Approximately 600 persons participated in the Junior Ranger program which involves youths in various conservation projects under the supervision of park rangers. Upon successful completion of these projects the participant receives a Junior Ranger arm patch with the rank of *basic*, *advanced* or *expert* depending on the type of projects completed.

During the year 220 people participated in the Volunteers In Parks (V.I.P.) program, giving freely of their time to assist park personnel in special projects such as the construction of nature trails, historical interpretation and the planting of flowers and shrubs in park areas.

Special events and programs were conducted in certain state parks. These programs are a cooperative effort between park personnel and civic organizations in local communities. They often include competitive activities

such as canoe and bathtub races, bicycle and fishing rodeos, wood chopping and sawing contests, horseshoe pitching, etc. Other programs conducted for the enjoyment of park visitors include historical interpretation and maple syrup demonstrations.

During the fiscal year 1976 the Park Service completed a manpower workload analysis to improve manpower efficiency. A research study on the rehabilitations of overused areas was instituted in cooperation with the United States Forest Service. Programs for improved attendance reporting and vehicle preventive maintenance were established.

STATISTICAL REPORT

Number of Park Areas 49
Number of Operational Parks 35
Attendance (33 Parks Reporting) 5,976,957

Maryland Forest Service

The goal of State Forest management is to provide a system of State Forests adequate in size, location, resources and amenities to meet the long-term needs of the people of Maryland.

During Fiscal 1976 the State Forests played host to 130,000 visitors, including hunters, campers, hikers, and birdwatchers.

State Forest employees provided protection from fire, insects and disease on 126,000 acres of public forest. Approximately 405 acres of State Forests were treated to control various forest tree pests and diseases.

State Forest timber was improved by cultural operations on 850 acres as compared to 800 acres in Fiscal 1975.

Habitat for game and non-game animals and birds was improved on 2,000 acres through planned forest management activities.

The forest hydrology on 126,000 acres of State Forest was maintained and enhanced by State Forest planning and practices.

Approximately 350 miles of State Forest roads, trails and boundaries were maintained and improved.

Forest inventories were completed for Green Ridge (34,000 acres), Pocomoke (12,000 acres) and Elk Neck (2,700 acres) State Forests. Comprehensive long-range planning was advanced for Savage River State Forest (53,000 acres).

State Forest personnel acted as director and instructors for the Forest Education Workshop at Camp Greentop, Maryland.

The cooperative State Forest visitation project (a two year project carried out by University of Maryland personnel) was completed and a report submitted. This study is being extended to cover the Green Ridge State Forest. This study

is to determine the number and kinds of visitors and the capacity of the Forests to accommodate them.

The prices of forest products rebounded well in Fiscal 1976, and timber harvests were expanded to take advantage of good demand and prices. Acquisition of new State Forest lands progressed considerably with 703 acres being added to the existing State Forests.

THE RURAL COMMUNITY FIRE PROTECTION PROGRAM was authorized and directed by the Secretary of Agriculture to provide financial, technical and other assistance to State Foresters and to organize, train and equip fire departments in rural areas and communities under 10,000 population to prevent and suppress fires.

The program was completed, and 32 Volunteer Fire Companies received the 50-50 matching funds of \$39,785.00 by December 23, 1975.

The Roadside Tree Division continues to keep the roadsides of Maryland beautiful. Roadside Tree Supervisors inspect all applications for tree trimming. Recommendations and proper protection of the trees involved are included on the engineering drawings. Almost constant supervision is needed at time of construction to assure that requirements are carried out.

During the past year, there were 2,030 roadside tree permits issued in the State. These permits cover all phases of tree work such as trimming and cutting by utility companies, sanitary installations by counties and towns, trimming done by county and state road departments and permits to individual property owners to trim or cut trees adjacent to their property.

Private requests ("*What's wrong with my tree?*") are also handled by the Roadside Tree Supervisor. These requests cover insect and disease damage, construction damage, vehicle damage and just "how to trim this tree." Four tree expert examinations were held in Annapolis during the past year. There are now 287 licensed tree experts in the State.

Maryland had the worst spring fire season in at least seven

years. The first and last portions were nearly normal, but the middle of April was extremely dry. Throughout the entire spring the Eastern region received only 15.46 inches of rainfall, and 5.89 inches of that occurred in January. In all there were 33 Class-3 days, 50 Class-4 days, and 15 days where the fire danger reached Class-5. The only large fire occurred in Dorchester County on April 4th. It burned 500 acres of marsh, and 51.4 acres of loblolly pine. The cause was listed as "refuse burning."

All forest wardens must receive approximately 400 hours of training in order to retain commissions.

The forest economy of the state depends on maintaining Maryland's 2,885,000 acres of commercial forest land in a productive state. This is approximately 46 percent of the land area of Maryland. The small private landowner controls about 90 percent of these forest acres.

The **Private Forest Management Section**, through its 22 project foresters and 14 forestry aides, gives assistance to the forest landowners of Maryland. Planning the total forest environment is the major emphasis of the management section.

Harvesting assistance to private landowners is concerned with producing more woodfiber as well as how its removal affects the appearance of the landscape. More effort is being placed on increasing the resource through more up-to-date and improved harvesting methods. Through financial assistance from the U.S. Forest Service, it has been possible to place a forester in the State Planning office for two years to help develop forestry input into the State's Comprehensive Plan.

The **Watershed Specialist** gives advice and guidance to private woodland owners as well as public and private water companies.

Educational programs throughout the State are helping young and old alike to become aware of the place trees play in the environment.

Requests for advice and service were received from at least 6,351 individuals over the past year.

Wildlife Administration

The Administration's overall objective during the Fiscal Year has been to maintain sufficient wildlife populations to meet the demands of wildlife oriented recreation and to ensure the continued survival of all wild flora and fauna in the State. Major new directions taken by the agency include establishment of new subsections for our Environmental Review, Resource Planning and Information and Education.

Because of increasing demands by all types of users of wildlife management areas, it is necessary to evaluate the demands more closely and attempt to provide the user public with as much as possible of the wildlife recreation that is demanded.

The **Environmental Review Project** was initiated to protect the wildlife resources of the State through environmental assessment of the many expanding private and public projects (wetlands, drainage, ditching, highways, bridges, dams, treatment plant discharges, etc.) in the tidal and non-tidal areas of the State.

The **Resource Planning Project** was initiated to coordinate and supervise the wildlife management plans and to direct wildlife planning activities with other local, State and Federal agencies.

The goal of the **Information and Education Project** is to educate the public about wildlife ecology, the necessities for wildlife management, what the Wildlife Administration does and hunter ethics and safety.

The **Forest Wildlife Program** is responsible for management of the Wild Turkey, Whitetailed Deer, Sika Deer, Ruffed Grouse, Gray Squirrel, Eastern Fox Squirrel, and Red (Piney) Squirrel. These wildlife species currently provide over one million hunter-days of recreation.

Program responsibilities include conducting technical sur-

veys to determine the status of each species and recommending policy and regulations to maintain or improve the status of the species.

The **Furbearer and Marine Mammal Program** is primarily responsible for the management of eighteen species of furbearers in Maryland. To date, its involvement with marine mammals has been limited to cooperation with the Smithsonian Institute on recovering and examining all stranded marine mammals under the Marine Mammals Salvage Program.

Presently this program is negotiating three extensive furbearer research projects: raccoon, otter, and nutria.

The objectives of the raccoon study are to determine this animal's reproductive parameters, mortality rates, physiological indices, food habits, home ranges and movements, and densities for the three physiographic regions in Maryland. This five year study was initiated in May 1976.

The objectives of the second study are to determine the productivity, mortality and valid census techniques for otter in Maryland. A technical paper on otter census techniques in Maryland was presented in the 1976 Northeast Wildlife Conference. This three year study will be completed in 1977.

The objectives of the nutria study are to determine the nutria's reproductive parameters, physiological indices, mortality rates, population levels, home ranges, movements, as well as the effects of marsh burning on nutria populations in Maryland. This five year study will be completed in 1979.

The **Land Management and Technical Services Program** is responsible for developing, maintaining and operating all State owned and cooperative Wildlife Management Areas, providing a technical advisory service for private landowners for the enhancement of their properties and relief from nuisance animal species; and for coordinating the Wildlife Management Field Program with local, state, county, and federal agencies, preparing comprehensive management

plans for the systematic development of all wildlife management areas, preparing environmental assessments on proposed public and private projects and providing personnel and equipment pools for temporary assignment to various staff projects.

During the 1976 fiscal year, the four regions provided increased services to the public. An increase in the interest in recreational use of public lands and wildlife has been noted.

The Nongame and Endangered Species Program includes those species of wildlife not legally classified as game birds or mammals and threatened or endangered species.

Program responsibilities include 37 species of amphibians, 46 species of reptiles, 280 species of birds, and 51 species of nongame wildlife.

In addition, the program is charged with the responsibility of conserving the species of wildlife which constitute the Official Maryland Endangered Species List.

The coordination of research responsibilities includes program planning and issuing endangered species, bird banding and scientific collecting permits.

The Upland Wildlife Program is responsible for the management of rabbits, pheasants, doves, woodcock and crows, and the recreational use of these species in Maryland. The goal of the program is to provide for the consumptive and nonconsumptive recreational demands.

The goal of the Upland Program is being met by monitoring the species, their distribution and abundance, and the habitat changes affecting them. The information collected is presented to the public through correspondence and public meetings.

The Upland Program works closely with Maryland Association of Soil Conservation Districts, Agriculture Stabilization and Conservation Service and U.S. Soil Conservation Service.

The Waterfowl Management Program. The wetland species in this program include eight species of dabbling ducks, eleven species of diving ducks, five species of sea-ducks, three species of geese, two species of swans, and the American coot, combined into a category termed waterfowl; plus the Florida gallinule, six species of rails and the jacksnipe. All of these birds are largely migratory, with only a small portion of the fall and winter populations being produced within State boundaries.

The Chesapeake Bay with its tributaries has been one of the most important migration and wintering areas of waterfowl on the North American continent.

The long range goals of the waterfowl program are to ensure the continued existence of the 30 odd species involved.

The Waterfowl Program conducts three types of studies: (1) surveys of waterfowl distribution and abundance, (2) surveys of habitat and, (3) surveys of waterfowl harvest, mortality and hunter use. Most of the studies are supported by Federal-Aid-in-Wildlife restoration; many are in cooperation with other conservative agencies, especially the U.S. Fish and Wildlife Service. All relate to waterfowl utilizing Maryland habitats.

Fisheries Administration

The Fisheries Administration is responsible for all aspects of the preservation, enhancement, development, and use of all Maryland's fishery resources. Management programs are carried out for both finfish and commercial fishing interests. Administrative functions and collection of fisheries statistics are also carried out by this program.

FINFISH

The **Estuarine Finfish Program** provides information necessary for management of resident, anadromous and marine finfish. Surveys and inventories are conducted to determine adult population levels, reproductive success and harvest rates. Technical assistance is provided for the construction of fishways and power plant siting. Environmental reviews of the impact of construction and development activities on the fishery resource are conducted.

Staff personnel include 10 members holding eight degrees in fields relating to natural resource management. Six summer technical assistants are usually employed.

In Fiscal Year 1976 Maryland issued 2076 commercial finfish licenses. These licensees landed 14 million pounds of finfish with a dockside value of \$2,127,551.00.

There are approximately 904,000 saltwater anglers who participate in recreational fishing in Maryland waters generating over \$350 million annually in expenditures associated with fishing activities.

Finfish Mortality

The staff investigated a total of 55 fish kills in Fiscal Year 1976, an increase of ten percent over Fiscal Year 1975, and one hundred and seventy-five percent over Fiscal Year 1974. There were 28 kills in tidal waters, 7 in flowing streams, and 20 in ponds. This compares with a total in Fiscal Year 1975 of 50 fish kills; 32 in tidal waters, 10 in flowing streams, and 8 in ponds.

The project evaluated three mortalities caused by pollution and assessed the violators \$437.13 for fisheries' losses. The project provides a service to pond owners by which they are supplied with information enabling them to document causes of pond kills, and when appropriate, to assess specific individuals or companies for damages.

A massive winter-kill of approximately 10-15 million yearling spot occurred in open water between Calvert and Queen Annes Counties in January. These young fish usually migrate out of the Chesapeake Bay during the fall. For unexplained reasons large numbers did not move out of the Bay as usual and were killed when water temperatures dropped below 20°C.

The first furunculosis mortality occurring in a naturally reproducing brown trout population in Maryland was documented in Baltimore County — Jones Falls in April.

The acquisition of work space at Matapeake on Kent Island and preliminary improvements enabled the staff to conduct essential laboratory work on fisheries problems.

The agreement for diagnostic work with the Southeastern Cooperative Fish Disease Project at Auburn University was continued. This project furnishes Maryland with bacterial and parasitic disease diagnosis, treatment and recommendations, and supplies instruction to our fisheries biologists. The project is funded 75% by Dingell-Johnson Federal money and 25% from Fisheries special funds. The total cost for the Fiscal Year 1976 agreement was \$8800.

A study is being conducted at the University of Maryland, School of Medicine to help the Department determine specific causes of fish kills through water and fish tissue analysis. This project is also funded by 75% Dingell-Johnson and 25% special funds. The total cost of this research for Fiscal Year 1976 was \$48,556.

Cold Water Fisheries

Trout Production and Stocking	
FINGERLINGS	200,000
CATCHABLE TROUT	
Rainbow Trout	
Stocked	168,000
Held for additional growth	25,000
Brook Trout	7,000
Brown Trout	<u>10,350</u>
TOTAL	210,350

This is an increase of 30,000 over 1975 in spite of a 25,000 fish reduction in our allocation of trout from Federal Hatcheries. Therefore, expansion of the Albert M. Powell State Trout Hatchery resulted in an increased production of 55,000 catchable size trout during 1976. A modest additional increase in the number of trout produced by this facility is expected for 1977.

Federal Aid Programs

STREAM SURVEY PROJECT — Approximately 60 streams representing 9 watersheds in Frederick, Baltimore and Washington Counties were surveyed relative to their potential for use in the trout program. The results of these surveys are published in the Federal Aid Reports prepared by project personnel. The total number of streams surveyed is over 160. Federal funding of this project amounted to over \$22,000.00

ATLANTIC SALMON PROJECT — American Smelt were experimentally introduced into Deep Creek Lake to provide a forage base for the future introduction of landlocked Atlantic Salmon. Federal funding of this project amounted to almost \$6,000.00.

The Cold Water Section has a full-time staff of 13 persons: 3 Biologists, 1 Biologist Associate, 6 Conservation Associates, 1 Conservation Aide and 2 full-time Conservation Assistants.

Warmwater Fisheries

The Maryland Warmwater Fisheries Program is responsible for the management of inland fishery resources in all streams, rivers, ponds, lakes and canals publicly or privately owned extending to the tidal boundaries designated by law.

During FY 76, Maryland had over 145,000 licensed anglers fishing in 49,993 surface acres of non-tidal fresh fishable water. Included as part of this figure are 26,196 surface acres of fishable non-tidal streams and rivers. An estimate of total production of these non-tidal waters has been calculated to be 10.7 million pounds.

FISH STOCKING FY 76

Age/Species/Numbers
Adults/Channel Catfish/22,000
Adv. Fingerlings/Largemouth Bass/11,000
Fingerling/Largemouth Bass/60,000
Fingerling/Bluegill Sunfish/300,000
Fingerling/Red-ear Sunfish/20,000
Fingerling/Channel Catfish/15,000
TOTAL = 458,000

FEDERAL AID PROJECTS

Potomac River Study
Deep Creek Lake Walleye Study
Warmwater Fisheries Investigations
Warmwater Fisheries Development

TECHNICAL ASSISTANCE

The Technical Assistance-Environmental Modification review Project attempted to review 1287 projects in Fiscal Year 1976. The monthly average of 107 projects compares with approximately 80 projects per month received in FY 75. Projects received for review are:

Program Open Space: 137

NPDES permits/applications: 169

U.S. Corps Engineers section 404 (of PL p2-500) permit applications: 372

A-95 State Clearinghouse projects: 93

Maryland Wetlands law permit applications: 423

Floodplain modification permit applications: 68

Other: 25

Of this total workload, approximately 15% received detailed evaluation and written response. The remainder were either judged non-significant to fisheries interests, or were adequately protected by the considerations of other DNR units (e.g., Wetlands), or were given "no action" because of staff/time limitations.

Clearinghouse, Corps of Engineers, section 404 permit applications, and State wetlands law permit applications were better covered than were NPDES and floodplain permit applications. This is because of the complexity of the type of information and knowledge required to adequately handle the latter two kinds of cases. Staff time was not available to give these case types the coverage they warrant. Program Open Space proposals are generally non-significant to fishery interests.

In addition to the technical assistance function, the project leader serves as program leader, overseeing the activity of the channelization investigation project, and late in the year, the Chesapeake Bay Creel Census Project.

The budget was \$34,700.00.

STREAM CHANNELIZATION

The stream channelization project, designed to evaluate the effects of channel alteration and modification of small

coastal plain streams on the Eastern Shore of Maryland completed its field investigations during Fiscal Year 1976. Prior to this time, field data concerning physical characteristics, water chemical properties, benthic invertebrate populations, detritus levels, and suspended sediments had been collected from the 19 study streams under investigation. During FY 76 fish population data was gathered from 45 stream stations on the Eastern Shore. Upon completion of the field investigations analysis and evaluation of the data was conducted and the completion report presenting findings and conclusions was written. Following completion of the final report for the channelization project in February, a sport fishing survey of the central Maryland portion of the Chesapeake Bay was designed. The survey is to determine the extent of the sport fishery in this area of the Bay and its corresponding economic value.

The Channelization Project during FY 76 employed a staff of two professional biologists.

SHELLFISH PROGRAM

OYSTER PROPAGATION:

This project is responsible for managing the oyster resource. The primary activities include the transplanting of oyster seed and the planting of fresh and dredged shell. A population survey is conducted every fall and winter to determine the condition of oysters previously planted.

Personnel from the oyster project also work with the Bay Bottom Survey currently surveying the tidal waters to determine the location and boundaries of the oyster and clam bars.

BLUE CRAB:

Monitoring the arrival of juvenile crabs and density of the population in order to make predictions as to the abundance and expected harvest is one of the primary tasks of this project. The project prepares and proposes regulations dealing with the management of the blue crab resource.

SOFT CLAM:

This project inventories the soft clam resource to determine the areas where there is a harvestable resource. Per-

sonnel from this project also assist on the Bay Bottom Survey.

HARD CLAM:

The planting of seed clams and monitoring their growth and harvest is the primary task of this project. Approximately 1,179,000 seed clams of the 1/4" to 3/8" size were planted throughout the coastal bays.

The commercial catch of hard clams is still dropping due to the lack of market demand. Efforts on the part of this program are being made in an attempt to rebuild this industry through its seeding project. The "cherrystone" size hard clam is still in demand and within a few years, such seed plantings could result in a greater landed value. Such planting costs the state approximately 1.3¢ per clam while yielding as much as 2.54¢ per clam landed value as a "cherrystone".

MARINE ANIMAL DISEASE INVESTIGATION:

This project monitors clams and oysters for diseases that could cause extensive damage or mortalities to the resources. When diseases are identified it is often possible to take managerial steps to minimize effects.

SHELLFISH HARVEST

Catch	Year	Amount	Dockside Value
Oysters	1975	2,560,796 bu.	\$11,667,379
	1976	2,369,017 bu.	\$14,034,146
Crabs	Hard	1975	24,622,709 lbs. \$ 4,054,666
		1976	24,247,830 lbs. \$ 4,277,102
	Soft and Peelers	1975	1,827,487 lbs. \$ 1,030,502
		1976	1,653,928 lbs. \$ 868,412
Clams	Soft	1975	2,097,680 lbs. \$ 1,779,000
		1976	1,472,393 lbs. \$ 1,793,686
	Hard	1975	46,424 lbs. \$ 29,945
		1976	34,121 lbs. \$ 30,805

Energy and Coastal Zone Administration

The Energy and Coastal Zone Administration's mission is to provide needed energy while keeping adverse environmental and fiscal effects to a minimum.

The three operating programs within the administration are Power Plant Siting, Bureau of Mines and the Coastal Zone Program. All three accomplish their tasks mainly through special and federal monies.

Power Plant Siting

The Power Plant Siting Program is charged with location and purchase for future use power plant sites which will best suit the needs of Maryland residents. Areas of work are 1) Impact Assessment, 2) Site Evaluation, 3) Research and 4) Site Acquisition.

YEARLY	STATISTICS
Number of acres in Land Bank	972
Sites evaluated	4
Research projects ongoing	18
Reports printed	25

Bureau of Mines

With the implementation of new legislation the Bureau of Mines has two distinct areas of responsibility: 1. Environmental control of active mines and 2. restoration of abandoned mines.

ACTIVE MINES

The Bureau evaluates mining plans for proposed deep and strip coal mines. Environmental controls are established and reclamation plans for the land are reviewed and must be approved before the mining operation can begin. Active mines are monitored for compliance with the law and agreement with the approved plans.

ABANDONED MINES

The new legislation makes possible the restoration of abandoned mines which for decades have presented serious environmental problems. Money collected from a surcharge on mined coal will be used to repair the environmental damage caused by abandoned mines.

Number of active Mining Permits	91
Tons of coal mined	2,821,851
Abandoned mine reclamation projects started	8 (with 1 completed)
Number of mining plans reviewed	80

Coastal Zone Management

The Coastal Zone unit is responsible for developing a management program to preserve, protect, develop, and, where possible, restore coastal resources in Maryland.

Fiscal 1976 represents the second year of a three-year development period for the program. Implementation of a state coastal zone program is to begin in Fiscal 1977.

The program has focused on completing the inventories necessary to determine geographic areas of particular concern; begun a study of onshore development associated with Outer Continental Shelf activities; established an aggressive public participation process to review other program elements; completed the draft *Comprehensive Dredge Spoil Disposal Plan*; completed the inventory and analysis of institutions and laws for managing coastal areas; worked with relevant state and federal agencies and local governments; has been relocated by a reorganization into the Energy and Coastal Zone Administration of the Department of Natural Resources.

Water Resources Administration

The Water Resources Administration protects, enhances and manages the water resources of the State through planning, permitting and enforcement programs. These problems are technically supported by Water Quality and Laboratory Service programs.

ENFORCEMENT

The **Enforcement Division** is responsible for the inspection and enforcement of the law and regulations for the Water Resources Administration under the Natural Resources Articles. The Enforcement Division also maintains a 24 hour duty roster through the Natural Resources Police radio watch.

The activities of the Enforcement Division are summarized as follows:

Activity	Total for F.Y. 76
1. Enforcement actions	867
2. Inspections	20,057
3. Complaints received	850
4. Permits, licenses, and approvals received for enforcement	2,499
5. Average number of insp./man/month	64.8

The primary responsibility of this division is enforcement. The following table indicates those enforcement actions in more detail:

Enforcement Actions	Total for F.Y. 76
a. New administrative enforcement actions	579
b. Supplemental and follow-up administrative actions	271
c. Civil penalty decisions	6
d. Court decisions	21
Total	877

(Note — 36 administrative cases were referred to the Attorney General for legal action.)

Penalties Collected	Total for F.Y. 76
a. Fish kill assessments	\$ 255.24
b. Administrative civil penalties	1,500.00
c. Court fines	4,150.00
Total	\$5,905.24

The actual operating expenditure for this program in fiscal year 1976 was \$580,624. Eighty-four percent of that figure was attributable to wages and salaries for 37 staff. Of the total expenditure for this program, approximately 20% came from EPA as part of the agency's Water Pollution Control Program Grant for fiscal year 1976.

PERMITS DIVISION

The **Permits Division** is responsible for issuance of the many authorizations provided for in Natural Resources laws and regulations. Permit approvals or denials are based on technical information gathered by this division and on information obtained at public hearings held for most permits and licenses.

Activities of this division by unit are reflected in the table below:

Wetlands	F.Y. 76
Board of Public Works Licenses	419
DNR Permits	22
DNR Approvals	21
Water Quality Certifications	454
Water Quality Review	1,136
Water Quality/Quantity	
Discharge Permits	255
Toxic Material Permits	77
Well Construction Permits	13,353
Appropriation Permits	330
Oil	
Oil Vehicle Operators Certificates	1,767
Oil Handler's Permit	990
Oil Terminal Facility Licenses	146

Watershed	F.Y. 76
Dams	8
Sediment Control	139
Waterway Permits	262
Small Ponds	2

The Permits Division total professional, sub-professional and clerical staff in fiscal year 1976 numbered 56, which represents 72% of the Division budget. The actual operating expenditure for this program in fiscal year 1976 was \$1,099,396. Of that amount, \$162,081 were Federal Funds received from EPA to assist in the funding of the Water Quality Discharge Permit Program. Another \$200,053 were State Special Funds used to operate the agency's Oil Permit, Licensing, Containment and Cleanup.

TECHNICAL SERVICES

The **Technical Services Program** is comprised of 67 personnel which represents 59% of the division budget. Total operating expenses for fiscal year 1976 was \$1,886,743.

Water Quality Services has had under survey and investigation many water areas within the State. Below are highlights of F.Y. 1976 activities:

1. 305(b) Sub-Basin Reports. Up-date of 305(b) reports as required as part of the FWPCAA-1972.
2. Blue Plains Sludge Disposal Monitoring -- Montgomery and Prince George's County Sites. Monitoring of water and groundwater on a monthly basis.
3. Monitoring
4. Waste Load Allocation Study -- Coastal Zone. Data collection conducted for input to Coastal Bay model.
5. Intensive sampling for modeling. Surveys were conducted for Eastern Bay, Choptank River, Little Choptank, Sassafras River, Bohemia River and Nanticoke River.
6. Primary Network Sampling (in Upper Estuary). Monthly sampling at 13 stations.

7. Primary Network Sampling (Chesapeake Bay Stations). Monthly sampling was conducted at both primary network and EPA stations.
8. Conversion of River Basin Segments. Began changing segments to new plan for State.
9. Biological Sampling. Biological sampling was conducted at several sites across the State.
10. Antietam Creek, Washington County, Maryland. Extensive sediment sampling of the Creek.
11. Water Quality Modeling. Operational models were completed for the Elk River, Back River and the Northeast River.
12. Initiation of 208 Project. Program implementation began for 208. non-point program.
13. Completion of Mathematical Modeling of Chesapeake Bay. Modeling utilized extensive data from 5 different Bay monitoring groups collected over 20 years, covering an area from Conowingo Dam to the Ocean.
14. Hart-Miller Island Monitoring. Routine background data collected and analysis continued (initiated in 1971).
15. State Dredging Projects. Monitoring conducted at selected proposed project sites where decisions regarding environmental impact were needed.

LABORATORY SERVICES

Instrumental in providing supportive data for most other Water Resources divisions. **Laboratory Services** are located in Annapolis, Tawes State Office Building and Western Maryland at Westernport. Below are highlights of F.Y. 76 activities:

Chemical Analyses	98,409
Bacteriological Analyses	4,589

HYDROLOGICAL SERVICES

The **Hydrological Services Section** has been directly involved in Flood Control, Sediment and Erosion control and

Storm Water Management. In addition, Hydrologic Service projects have included surveys and investigations outlined below:

1. Work has begun on implementation of the new Flood Control Program, H.B. 839.
 2. National Flood Insurance Program — Continued major effort to assist local jurisdictions with this program.
 3. Work continued on Mattawoman, Little Catoctin, Sawmill and Collington studies.
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REPORTS/PAPERS PREPARED BY WATER RESOURCES ADMINISTRATION STAFF

1. "Urban Sediment Control — The Maryland Experience," presented at the National Soil Erosion Conference, West Lafayette, Indiana, May, 1976.
 2. "Water Supply Management Program for the State of Maryland," presented at Seminar on State Water Supply Planning, Massachusetts, September/October, 1975.
 3. "Report to the Legislative Council, Disposal of Hazardous and Industrial Wastes in Maryland," October, 1975.
 4. "Designing Stable Stream Systems in an Urban Environment," presented at the American Society of Agricultural Engineers, Chicago, December, 1975.
 5. "Enforcement Requires Education," presented at the American Society of Agricultural Engineers, Chicago, December, 1975.
 6. "Urban Sediment Control Design Criteria and Procedures," presented at the American Society of Agricultural Engineers, Chicago, December, 1975.
 7. "Resources Identification Study For the Anacostia River Basin," presented at the North Atlantic Region of ASAE Annual Meeting, Ithaca, New York, August, 1975.
 8. "Development of Maryland's Spill Control, Containment and Cleanup Program," presentation at the National Conference on Control of Hazardous Material Spills, New Orleans, Louisiana, April, 1976.
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Maryland Environmental Service

This agency of the Department of Natural Resources reached its sixth anniversary on July 1, 1976. Created by the General Assembly as a non-profit utility corporation, the **Maryland Environmental Service** serves as the "utility arm" of the State by providing water, waste water and solid waste services to the political sub-divisions, regions and industries, and other private interests.

To diminish environmental damage, to offer economy of scale and to spearhead new and innovative approaches to the solution of waste disposal problems, the Maryland Environmental Service offers a wide range of services to local governments, industries, and other state agencies. These include planning, design, financing, construction, operation and maintenance of solid waste facilities, liquid waste management facilities, water supply, resource recovery and special and hazardous waste management services and facilities.

Although the legislation did not require it, one Maryland Environmental Service objective has been to become self-supporting. In the six years since its establishment, the Service has very nearly achieved this status. The projected 1977 fiscal year total budget is \$7.5 million, of which \$7.1 million comes from earnings. Earnings are attained through re-imbusement of direct expenses and recovery of indirect expenses allocated to each project.

The Service now owns or operates \$17 million in plant facilities, including the recently acquired assets of the Joppatowne Utilities Corporation for \$3,150 million. These facilities serve more than 2100 families in Harford County.

The Operations and Maintenance section is responsible for more than 76 facilities throughout the state. This section provides cost effective management for State institutions, as well as local governments and private concerns.

Resource Recovery is underway at Cockeysville in Baltimore County, where the facility funded by the State of

Maryland through the Environmental Service and the county government is currently processing 500 tons of solid wastes per day. The project has been scaled up to eventually handle 1500 tons per day.

Current construction projects in which the Maryland Environmental Service is involved total \$10 million.

The service is presently working with the U.S. Agricultural Research Service at Beltsville to develop improved methods of composting sewage sludge and is managing the land disposal of 179 tons of sludge per day from the Blue Plains treatment plant.

Waste tires are being baled, under an agreement between the Maryland Environmental Service and Ocean City, for use in an off shore fishing reef. 250,000 tires were baled and barged to the reef during Fiscal Year 1976.

Special and hazardous waste management is another area of Maryland Environmental Service concern and efforts are underway to provide environmentally safe means of disposal of such materials.

Maryland Geological Survey

Legislation passed by the General Assembly in 1976 removed the Bureau of Mines from the Survey. This action completed a series of legislative acts begun in 1964 which have effectively removed regulatory functions from the Survey and allows the Survey to focus on its mission to conduct applied scientific research on the geology, archeology, mineral resources and water resources of the state. The Survey's research effort is designed to address problems related to water supply, water pollution, assuring a continuing supply of mineral resources, land use, the use of the Chesapeake Bay and bay bottom, shore erosion, and the study and preservation of archeological sites threatened by development.

During 1976, the following major investigations were in progress:

STREAM FLOW GAGING NETWORK continuing project to monitor stream flow throughout the state.

WATER QUALITY AND SEDIMENT NETWORK continuing study of the chemistry and sediment content of streams at selected locations.

GROUND WATER DATA NETWORK continuing monitoring of ground water levels in selected wells and springs throughout Maryland.

AQUIFER RESEARCH — PIEDMONT ROCKS OF HARTFORD COUNTY completed in Fiscal Year 1976. A basic data report was published and two hydrological atlases covering the Bel Air and Jarrettsville Quadrangles were open-filed.

GEOLOGY AND HDYROGEOLOGY OF CARROLL COUNTY

This is a three-year project to prepare a series of 7½ minute quadrangle hydrogeological atlases.

AQUIFER RESEARCH — COASTAL PLAIN MODELING A report on the Aquia Aquifer was published, the Manokin Aquifer in Worcester County was being investigated and a special geophysical survey on the Eastern Shore was underway.

SOUTHERN MARYLAND MAGOTHY AQUIFER PROJECT

This project was in the final year and a report is in preparation which will define the yield capabilities of the aquifer.

PINEY POINT AQUIFER PROJECT This project will result in a digital simulation model of the Piney Point Aquifer and will include portions of the Eastern Shore and Southern Maryland.

BALTIMORE-WASHINGTON URBAN AREA STUDY A project to provide planners, engineers and the general public with information about the physical environment of the expanding Baltimore-Washington urban areas. During 1976, work was completed on the White Marsh and Middle River Quadrangle Atlases, geologic maps of the Baltimore East and Baltimore West Quadrangles were being prepared for publication, mapping was initiated in Howard County and work was initiated on a Prince George's County Mined-Land Inventory Map.

QUANDRANGLE TOPOGRAPHIC MAPPING A cooperative program with the U.S. Geological Survey is generating orthophotomaps of quadrangles on the southern Eastern Shore. Ten of these quadrangles were issued in 1976. An orthophotomap presents the same data as a normal quadrangle map (topographic contours, streams, cultural features) but, in addition, depicts land use by a special technique that rectifies aerial photography to map accuracy

and presents it as a screened base for the topographic map.

SOUTHERN MARYLAND GEOLOGIC MAPPING The Mt. Vernon and Piscataway 7½ minute Quadrangles were completed and will be published in Fiscal Year 1977.

BLUE RIDGE GEOLOGIC MAPPING Four 7½ minute quadrangles in Frederick and Washington Counties (Myersville, Catoclin Furnace, Blue Ridge Summit, and Middletown) are now complete and will be published in 1977.

COUNTY TOPOGRAPHIC MAPPING A revised topographic map of Carroll County was completed and sent forward for publication. The maps of Caroline, Dorchester, and Garrett Counties were reprinted.

MINED-LAND MONITORING (Coal) The Survey in cooperation with NASA is developing a methodology for monitoring surface coal mines by use of LANDSAT (satellite) imagery.

GEOPHYSICAL MAPPING In cooperation with the U.S. Geological Survey, an aeromagnetic map and a gravity map of Maryland are being prepared at a scale of 1:250,000.

ACTIVITIES RELATED TO THE OUTER CONTINENTAL SHELF The Survey provides the state with geological expertise relating to the exploration for oil and gas on the mid-Atlantic continental shelf. During 1976, the Survey acted as recipient of data from a deep stratigraphic test drilled seventy-eight miles off the coast of New Jersey. The test was drilled to a depth of 16,000 feet by a consortium of thirty-one petroleum companies and represents the first detailed data on the subsurface geologic formation beneath the mid-Atlantic continental shelf.

SHORE EROSION MONITORING This project, begun in 1970, monitors shore erosion at over 200 sites around the bay on a semi-annual basis.

ASSATEAGUE AND OCEAN CITY BEACH AND DUNE MONITORING A series of profiles of the beach and dune are made during the winter and summer.

CHESAPEAKE BAY EARTH SCIENCE STUDY This is a major project to map the sediment characteristics of the bay bottom. The data developed by this study will be useful in determining sedimentation rates, delineating bottom conditions favorable for shellfish, monitoring effects of dredged spoil disposal, and discovering ancient filled river channels which may be important ground water sources. This project is being funded by the Energy and Coastal Zone Administration in cooperation with the Survey. Logistical support is being provided by Capital Programs Administration.

ARCHEOLOGICAL PROJECTS AND ACTIVITIES The Survey continued to coordinate professional and amateur archeological activities in Maryland, respond to public information requests, and serve as a repository for data and specimens relating to Maryland archeology. Copies of all known manuscript and published reports on Maryland archeology are maintained on permanent file. The Survey participated in investigations of prehistoric and historic archeological sites subject to damage in Frederick, Kent and St. Mary's Counties. Reports were completed on two previous excavations by the Survey in Anne Arundel and St. Mary's Counties. With funding from the Maryland Department of Transportation, archeological reconnaissance and reports were completed for eighteen proposed transportation projects (mostly highways). The Survey received and approved six applications for permits to conduct archeological investigations on state-owned lands, as provided for under the Maryland Archeological Resources Act of 1968.

Natural Resources Police Force

The Natural Resources Police Force consists of two operation divisions, (Marine and Inland) and an Administrative Section (General Direction). It is responsible for enforcement of all laws and regulations concerning the natural resources of Maryland and for enforcement of the State Boat Act on both tidal and non-tidal waters.

The Inland Division with a complement of 70, is responsible for enforcing the laws and regulations relating to both game and non-game species of wildlife, including wild waterfowl and migratory birds, and laws and regulations relating to fish and fishing in the non-tidal waters of Maryland, the boating laws and regulations on non-tidal waters, and the litter laws.

The Marine Division's complement of 134 concentrates its activities on the tidal waters of Maryland, primarily enforcement of conservation laws and regulations and of the State Boat Act.

The **Administrative Section** plans and provides services for the operational divisions. The Natural Resources Police Academy, the Aviation Section, and the Maintenance and Supply Section make up General Direction. Each operational division also conducts a specialized public education program, that of the Inland Division being a Hunter Safety Education Program and that of the Marine Division — a Boating Safety Education Program.

The following is a summary of the activities of the Natural Resources Police Force for Fiscal Year 1976:

General Direction

<u>POLICE ACADEMY:</u>	Man-days	Man-hours
Recruit Training	770	8,470
Cadet Training	1,686	13,488

Other:

Maryland Police Training		
Comm.	240	1,680
Maryland Park Service	41	328
Noise Control	19	152
Annual Firearms Qualification	63	504

AVIATION SECTION:

Hours Flown		
Natural Resources Police		87.9
Water Resources		51.3
Fisheries Administration		18.0
Health Department		3.4
Dept. of Licensing and Regulation		1.4
Anne Arundel County (Survey)		2.6
Maryland Geological Survey		0.6
	TOTAL	165.2

MAINTENANCE AND SUPPLY:

Maintenance Job Orders Completed		
Natural Resources Police		887
Other Agencies		52
	TOTAL	939

Services of Supply Section

Store Requisitions		
Natural Resources Police		1,561
Other Agencies		127
	TOTAL	1,688
Repair Job Orders		939
Receiving and Inspection Reports		201
Emergency Purchase Orders		715
Out of Schedule Orders		112
General Contract Orders		103
	TOTAL	3,758

Marine Division

FIELD ENFORCEMENT:

Arrests:		
Conservation		1,138
Boating		2,027
Water Resources		44
	TOTAL	3,209

Warnings:	
Conservation	458
Boating	<u>2,867</u>
TOTAL	3,325

Inspections:	
Boats	135,541
Seafood Establishments	<u>22,199</u>
TOTAL	157,740

Court Appearances	1,283
Convictions	3,097
Assists	1,726
Public Relations Details	209

INVESTIGATION SECTIONS:

Accident Investigation:	
Accidents	109
Boats Involved	275
Deaths	
Drowning	21
Heart Attack	1
From Injuries	3
Non-fatal Injuries	43
Property Damage	\$494,458

General Investigation:	
Boats Stolen	243
Motors Stolen	98
Boats Recovered	121
Motors Recovered	22
Investigations	221

COMMUNICATIONS:

Calls Received	9,221
Case Numbers Assigned	1,451
Cases Closed	1,263

BOATING SAFETY EDUCATION:

Courses Distributed by Mail	2,171
Courses Distributed by Dept. Personnel	15,517
Schools Using Courses	19
Films	48

Inland Division

FIELD ENFORCEMENT:

Phone Calls Received	
At Regional Offices	32,561
At Officers' Homes	21,328

TOTAL 53,889

Visits to Officers' Homes by Public	985
Complaints Received	2,835
Arrests	2,088
Warnings	487
Assists	631
Search and Rescue Operations	8

INVESTIGATION SECTION:

Arrest Warrants Processed	35
Investigations	20
Special Floating Team:	
Hunters Checked	1,729
Violations Handled	102

AERIAL RECONNAISSANCE:

Jacklighting	26 hours
Waterfowl Baiting	6 hours

COMMUNICATIONS:

Mobile Installations	16
Mobile Repairs	74
Base Station Repairs	33

HUNTER SAFETY EDUCATION:

Training:	
Instructors in Program	420
New Instructors Certified	92
Maryland Safe Hunters Certified	6,352
Attendance at Lecture-Workshops	5,971
Accidents:	
Fatal	3
Non-fatal	51

IN A NATURAL RESOURCE EMERGENCY OR FOR ASSISTANCE — TELEPHONE 267-7740.

The facilities and services of the Department of Natural Resources are available to all without regard to race, color, sex, age, national origin, physical or mental disability.

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