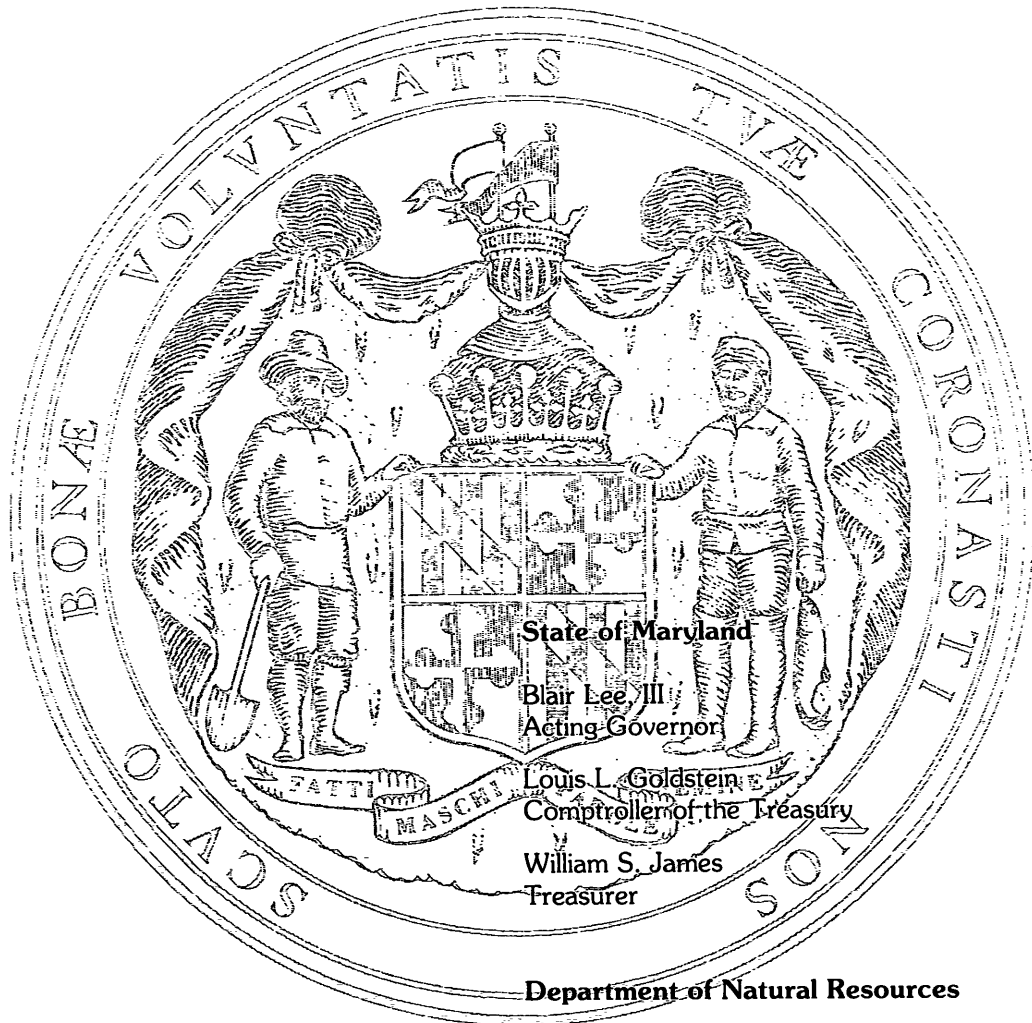


Maryland Department of Natural Resources ANNUAL ACTIVITIES REPORT □ FISCAL YEAR 1978

DEPARTMENT OF NATURAL RESOURCES
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State of Maryland

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Comptroller of the Treasury

William S. James
Treasurer

Department of Natural Resources

James B. Coulter
Secretary

Louis N. Phipps, Jr.
Deputy Secretary

The Maryland Department of Natural Resources
ANNUAL ACTIVITIES REPORT 1978



In Fiscal 1978, the people of DNR,

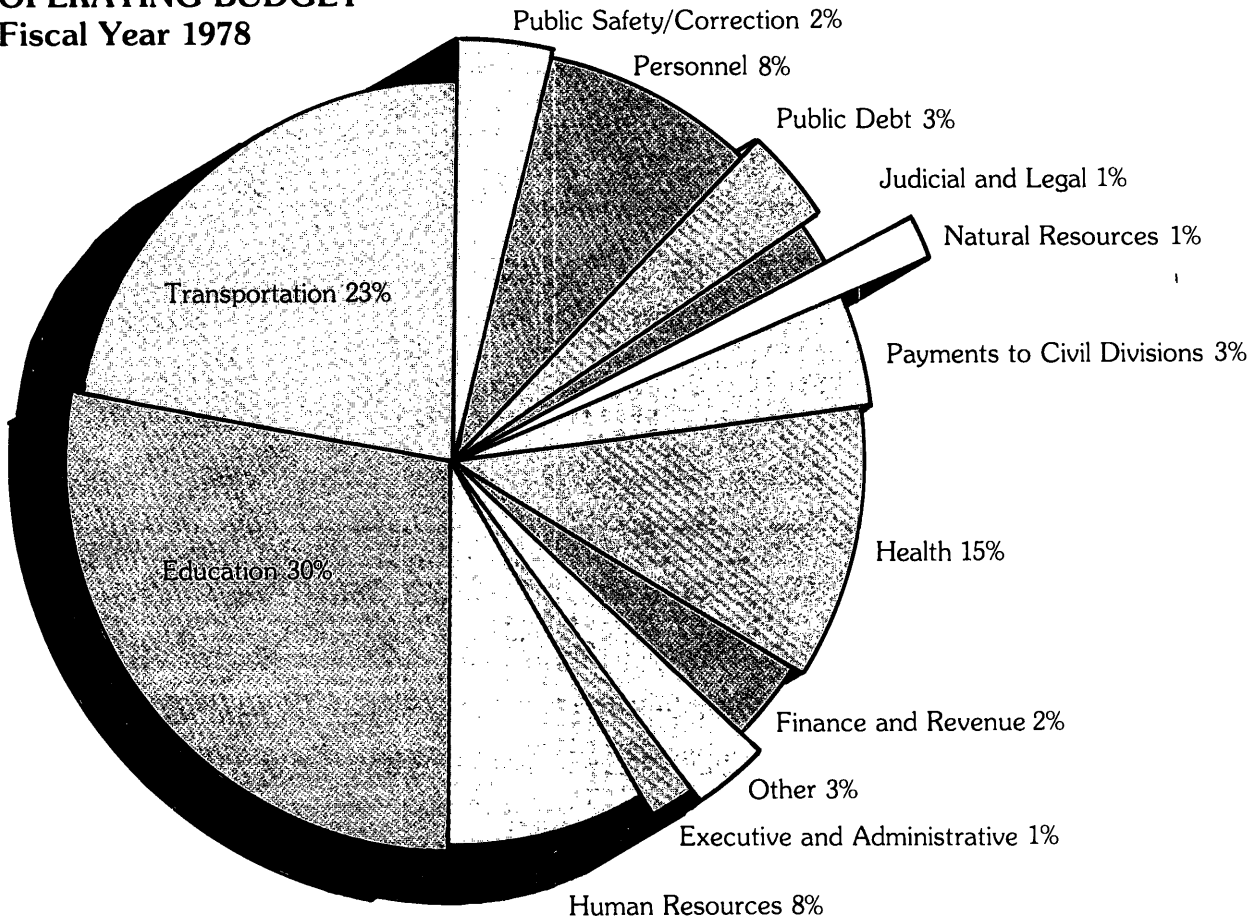
among other things, planted 150,000 trees, inspected 36 dams, removed 183 derelict vessels from Maryland's waters, licensed 178 master well drillers, gave first aid to 1,581 park visitors, conducted 5 orientation programs for new employees, sent 1,700,000 letters, distributed 11,702 sets of Safe Boating Course material, arranged for the acquisition of 12,197 acres of Natural Resources land, responded to 429 oil spills, distributed 35,000 free tide tables, catalogued 4,000 library publications, flew 97 hours for law enforcement surveillance, published 6 issues of *The Maryland Conservationist*, initiated 1,482 Water Resources enforcement actions, welcomed the participation of 708 volunteers teaching 15,511 courses in hunter safety, inspected 123,404 boats, stocked Maryland's streams with 277,000 catchable size trout, distributed 20,000 Natural Resources coloring books to schoolchildren, issued 392,444 hunting licenses, supervised 750 summer students, awarded certificates to 4,000 sportfishers, registered 163,604 boats, gave out 35,000 crab rulers to promote conservation, issued 163,246 anglers' licenses, passed out 35,800 *Keep America Beautiful* litterbags and baskets, arrested 3,114 violators of Natural Resources regulations, recovered 127 stolen boats, planted 1,200,000 seed clams, operated 94 water and wastewater treatment plants, performed 147,140 laboratory analyses, issued 1,093 licenses, permits and approvals for wetlands activities, supervised the installation of more than two miles of protective bulkheading, reclaimed 35.2 acres of strip mining land, employed 320 members of the Youth Conservation Corps, maintained 322 miles of hiking trails, and helped complete the resurvey of the Maryland/Delaware border.



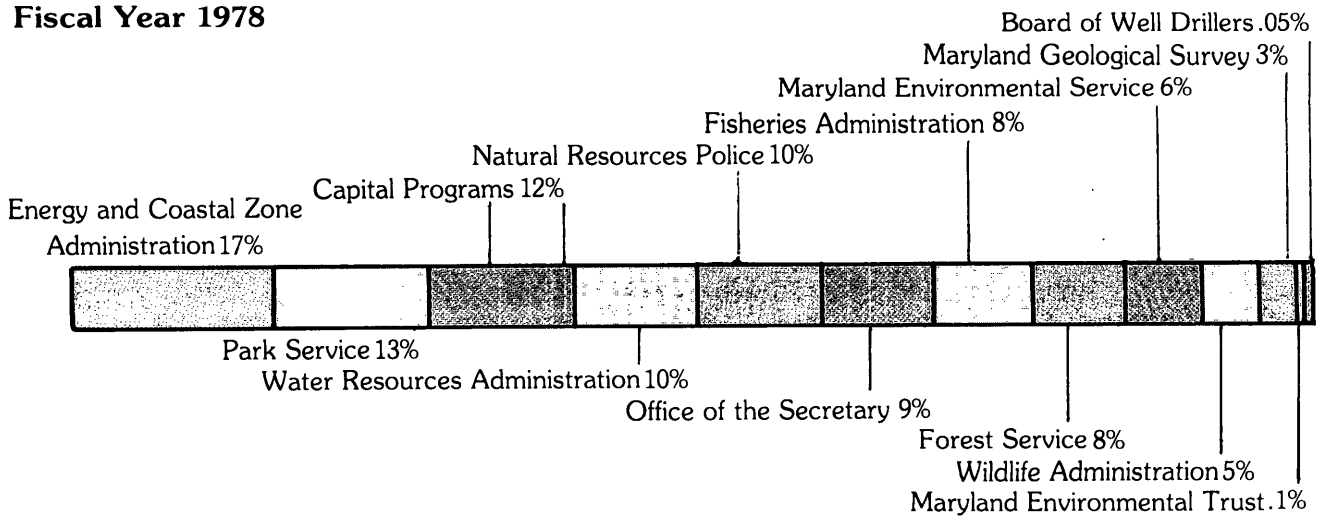
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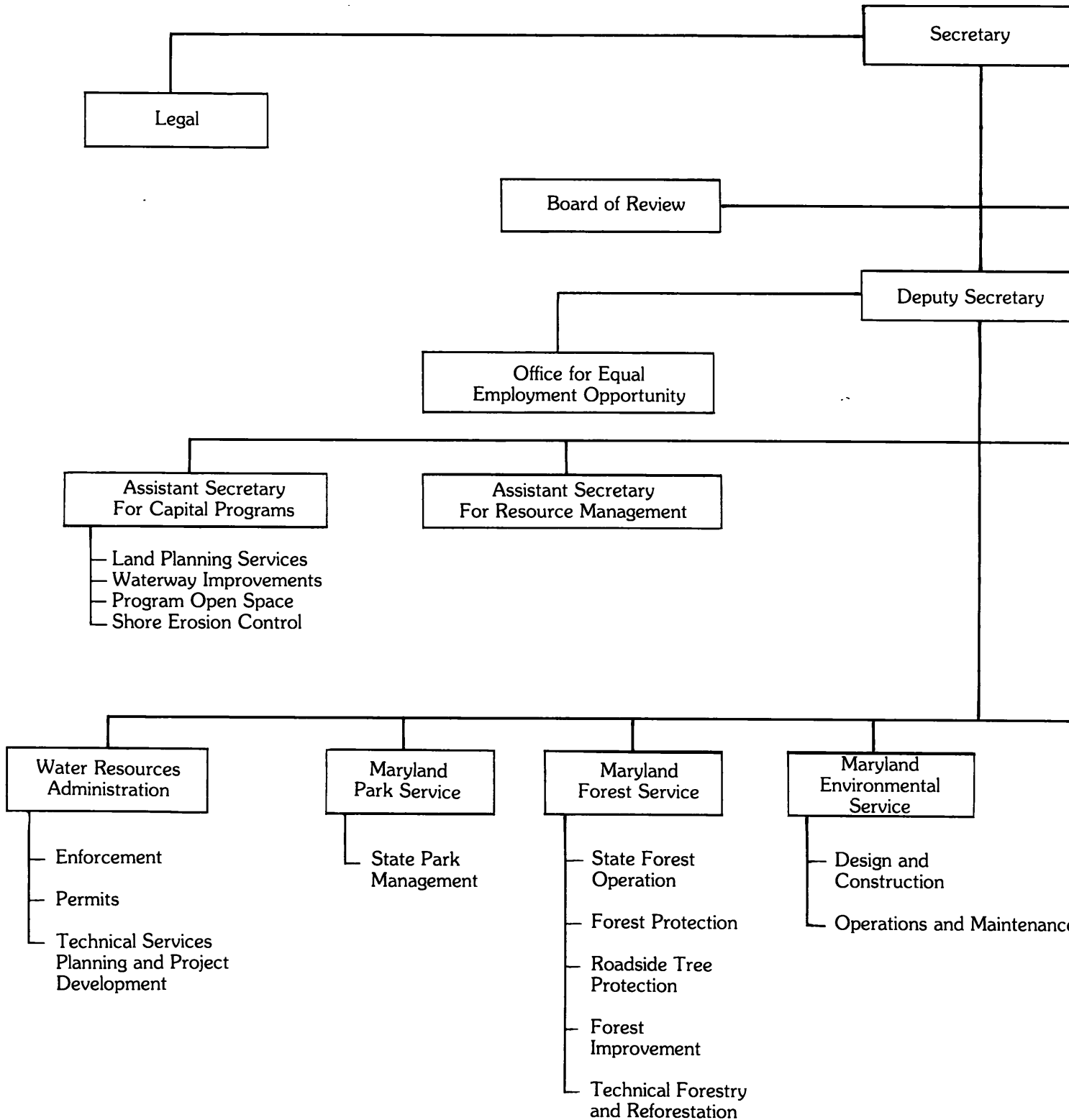
**State of Maryland
OPERATING BUDGET
Fiscal Year 1978**

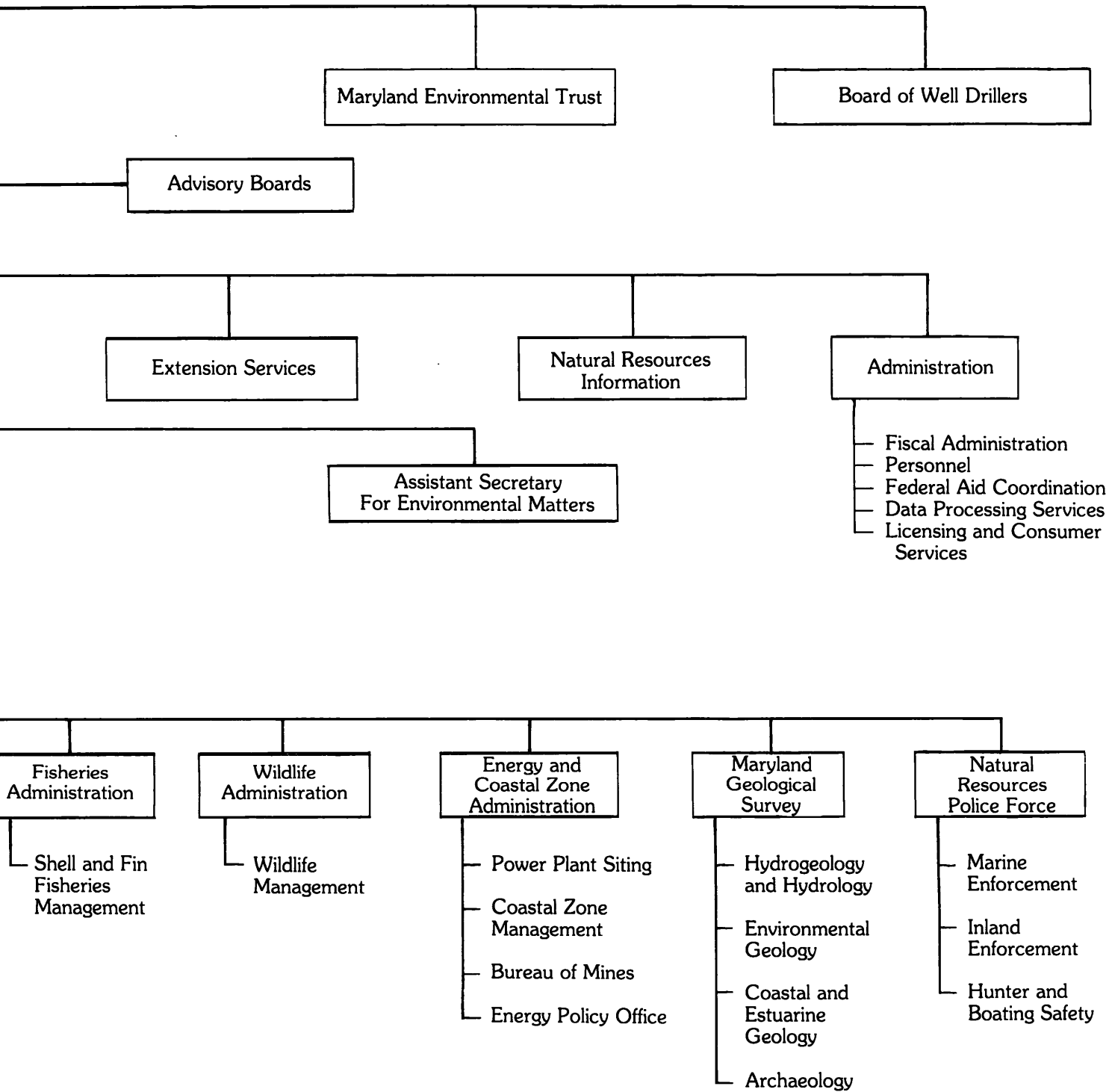


**Department of Natural Resources
OPERATING BUDGET
Fiscal Year 1978**



**DEPARTMENT OF NATURAL RESOURCES
TABLE OF ORGANIZATION**





OFFICE OF THE SECRETARY

	Budget
General Funds	\$2,709,005
Special Funds	1,037,464
Federal Funds	<u>120,715</u>
TOTAL	\$3,867,184

Number of Staff 179

During the 1978 fiscal year, the operating budget reflected that in excess of \$46 million was either expended or obligated. During this same period approximately \$52 million was received and allocated to the various units.

Accounts receivable documentation was provided on 1,128 individual accounts in the total amount of \$1,505,816 of which twenty accounts were with various Federal agencies totaling \$1,079,737.

The department maintains fiscal information on the property purchased by the agencies totaling \$165,898,171. Of this amount \$149,851,750 represents land and buildings and \$16,046,421 represents capital equipment.

Special, Federal and Capital Fund Management

It is the responsibility of the Special, Federal and Capital Fund Management project to maintain all fiscal and statistical records for each authorized federal or state project.

Detailed fiscal records were maintained on 470 specific projects totaling \$27,510,000. These projects were financed as follows: 58 Waterway Improvement Fund projects in the amount of \$2,643,000; 65 Shore Erosion Loan Fund projects for a total of \$896,000; 60 General Construction Loan projects amounting to \$2,993,000; 198 Outdoor Recreation Land Loan projects totaling \$12,111,000; and 89 Federal Grants projects amounting to \$8,867,000.

Supportive Services Section The Supportive Services Section has the primary charge of controlling the real and personal property purchased or otherwise received by each unit within the department. As of June 30, 1978, the value of the land and buildings to which the department holds title exceeds \$149 million. Equipment inventory amounts to \$16 million. Included with the equipment are 244 sedans, 682 trucks, 761 boats and one airplane.

Another charge of this section is to purchase or coordinate the purchase of all equipment and supplies. To accomplish this charge, 3,645 requisitions were prepared, logged, verified and computed.

General supervision of the department's mail distribution and the automotive and radio repair facilities is given by this section.

The Secretary, the Deputy Secretary and Assistant Secretaries of the Department of Natural Resources provide the establishment, coordination and direction of departmental policy. The Office of the Secretary is ultimately responsible for all aspects of resource management and environmental policy as planned and implemented by the agencies of the department. The Office of the Secretary maintains liaison with various legislative bodies, as well as communication with the public. The Office of the Secretary furnishes supporting services to all Department of Natural Resources agencies.

FISCAL SERVICES

Fiscal Services serves the financial needs of the thirteen separate agencies within the Department of Natural Resources. In order to accomplish this charge efficiently and economically, Fiscal Services is further divided into five projects. They are: 1) General Accounting, 2) Special, Federal and Capital Fund Management, 3) Supportive Services, 4) Auditing, and 5) Wage and Hour.

General Accounting Section The primary charge of the General Accounting Section is to control the annual budgetary appropriation; authorize the Comptroller to disburse funds as payment for its obligations; receipt and allocate all revenue attained; maintain control over the operating budget; and provide fiscal information on the department's property and receivables.

Auditing Section The auditing project is subdivided into three disciplines. They are 1) Internal, 2) Seafood Dealer, and 3) Boat Dealer.

The *Internal Audit* team insures the accountability of all real and personal property generating to the department, inspects each regional work and service center for compliance with the applicable fire and safety codes, and audits individuals distributing departmental licenses.

This Department owns and uses about 280 facilities. During the 1978 fiscal year 139 facilities were inspected and audited.

The *Seafood Dealer Auditor* examines the records of those individuals and firms licensed to harvest, sell or pack seafood secured from the waters of this state or imported from out-of-state.

The *Seafood Audit* team verified the records of 177 dealers. It also verifies the records of those harvesters who market their own catch. During the fiscal year eighteen such individuals were visited.

The *Boat Dealer Auditor* examines the records of those firms licensed to sell, exchange or consign pleasure boats to the general public. This section also works closely with the Comptroller of the Treasury - Sales Tax Division, to insure the collection of applicable tax.

Wage and Hour Section The Wage and Hour section insures timely salary payments to each of the Department's employees, maintains an accurate work and leave record for each employee and annually prepares the personnel section of the operating budget. The section also coordinates the retirement and the health and accident activities between employees and the respective regulatory agency.

Other Services The Office of the Secretary oversees the operation of the departmental mail room. During the 1978 fiscal year, it is estimated that this activity handled in excess of 1,700,000 pieces of mail and more than 11,000 parcels. The expenditure for postage alone totaled more than \$150,000.

Assigned to the Fiscal Services Section are two separate automotive maintenance facilities to service the automotive equipment assigned to the agencies within the department. One is located at Green Ridge in Allegany County and the other is at the Hollofield Section of the Patapsco Valley State Park.

During the 1978 fiscal year 908 jobs were performed on the existing fleet; in addition, all new vehicles received either as a replacement or addition to the fleet were serviced.

The Department of Natural Resources has in excess of 1,300 pieces of radio and raydist equipment distributed at various departmental locations throughout the State. During the 1978 fiscal year 1,034 of those items were either tested, repaired, re-installed or calibrated.

PERSONNEL ADMINISTRATION

This administration is responsible for all personnel services and transactions for the Department.

Personnel Administration Activities

Transactions Processed	4,922
Appointments	1,428
Permanent	206
Seasonal	1,222
Reclassifications	590
Promotions	141
Suggestions Processed	9
Cash Awards	2
Pending	6
Blood Program	
Drives	2
Donors	152
Miscellaneous Campaigns (CICHA-United Fund)	
Annual Salary Review	
Requested New Classes	18
Salary Adjustments	6
Approved New Classes	4
New Employee Orientations	5
Career Day Presentations	2

DATA PROCESSING

Significant achievements included installation of 8 IBM video display screens and a controller to serve Licensing and Consumer Services, Natural Resources Police, and Fiscal Services. Other Department of Natural Resources agencies which were assisted with new projects in FY 78 included the Wildlife Administration, Forest Service, Fisheries Administration and Water Resources Administration.

BOARD OF WELL DRILLERS

The Maryland State Board of Well Drillers issued the following licenses: Master Well Driller - 178; Journeyman Well Driller - 87; Apprentice Well Driller - 69; Well Driver - 24; Well Digger (hand dug) - 2; Pump Installer - 39; Water Conditioning Installer - 28; and Temporary - 2.

Twelve board meetings were held. Forty-six examinations were given and 7 hearings were held. Five licenses were suspended. License fees collected amounted to \$13,375.00. Application fees amounted to \$900.

LICENSING AND CONSUMER SERVICES

Licensing and Consumer Services is responsible for administration of the *State Boat Act*, with regard to titling and registering boats; the recordation of security interest in vessels, the administration of the licensing, permits, special tax report and collection requirements of *Natural Resources Article*. This section is responsible for the sale of the *Guide for Cruising Maryland Waters* and other department publications.

The seven locations operated by the Licensing and Consumer Services program responded to 756,425 applications for conservation, preservation or recreation licenses during fiscal year 1978 and collected \$4,433,422 in fees. Personnel processed 5,426 oyster and clam buyer reports, collecting \$992,614 in severance, import and export taxes on resources protected by the Department. In processing the applications for Maryland certificate of boat titles, \$4,220,271 was collected in boat title tax in lieu of the 5% sales tax. Of the 29,055 applicants 990 were notified of insufficient tax payments. These payments were subsequently collected by Licensing and Consumer Services' staff. Validation stickers were mailed free of charge to 12,056 owners of boats registered for 3 years who were not due for renewals.

This unit provided liaison and control of 555 boat dealers, 17 hunting and anglers' license distributors, 57 consignment agents, 400 sales agents, 167 oyster dealers, 37 clam dealers, 260 crab packers and shippers, 28 non-resident seafood dealers and 24 Clerks of Court.

Personnel in the office in Annapolis and in the six regional service centers distributed over 1,000,000 information pamphlets dealing with Natural Resources.

A total of 46,062 citizens personally brought their applications to our offices: 11,011 were served at the Tawes Building in Annapolis; 3,683 at the Regional Service Center in Cumberland; 9,853 at the Regional

Service Center in Bel Air; 6,231 at the Regional Service Center in Laurel; 8,250 at the Regional Service Center in Salisbury; 4,000 at the Regional Service Center in Centreville and 3,034 at the Regional Service Center in Mechanicsville.

Sixteen percent of the commercial fishing licenses and 17% of the boats registered were licensed free of charge, as exempted by law.

The Licensing and Consumer Services staff at 6 regional service centers continued administrative support to the units of the Department of Natural Resources, reacting to the regional managers and field personnel. Since the creation of the regional service centers concept, four years ago, the demand for service has doubled, either directly from the public or indirectly through the units based in the center or at work stations in the region.

Other than the 2 positions for the two newest offices, Centreville and Mechanicsville, there has been no increase in Licensing and Consumer Services' staff in the regional offices.

Receipts from the special funds collected were utilized to support special activities of the Fisheries Administration, the Wildlife Administration, the Forest Service, Natural Resources Police and the Office of the Secretary, Capital Programs Administration.

A summary of sales and transactions for Fiscal Year 1978 follows:

Commercial Fishing Licenses	28,677	\$ 455,514
Boat Title and Registration	163,604	667,511
Boat Title Tax	29,055	4,220,271
Hunting Licenses and Permits	392,444	2,265,390
Anglers Licenses	163,246	647,942

EXTENSION SERVICE

The Extension Service provides the Secretary of the Department with the closest possible contact to the state's citizens and others who utilize the Department's services or who are affected by the Department's legal mandate.

The Extension Service supports the Office of the Secretary and the policies the Secretary may issue both publicly and within the Department. The Service is charged with the dissemination of these policies and with the gathering of public reaction to the activities of the Department. The Service maintains a working knowledge of all natural resources management and planning activities within the state. The Extension Service acts as an ombudsman between the public and the Department.

The director serves as the liaison officer for the *Secretary's Advisory Board* and the *Boat Act Advisory Committee*. He is a member of the board of *Chesapeake Appreciation Days, Inc.* and serves as the Department's interface to several other groups and organizations.

Regional Service The backbone of the Extension Service is formed by four regional Extension Service specialists stationed in the Cumberland, Bel Air, Laurel and Salisbury Service Centers. To further the policies of the Secretary, to gather information for the Secretary, and to support the various agencies, Extension Service specialists attend hundreds of meetings each year, provide field assistance to hundreds of clubs, citizens, landowners, schools and city, county, state and federal agencies, and deliver scores of talks to groups.

Save Our Streams Jointly sponsored by the Extension Service, Izaak Walton League, Trout Unlimited, and a growing number of other organizations, Save Our Streams (SOS) offers citizens the opportunity to preserve and enhance Maryland's 17,000 miles of streams and rivers. Through SOS any individual or group, can "adopt" all or part of a stream. The adopter assumes the responsibility of identifying and correcting each stream quality detriment. Currently some 500 miles of streams have been adopted across the state by 200 citizens. SOS activities include litter clean-ups and sophisticated research efforts.

Boating Liaison The Extension Service is charged with the liaison between the Department and the United States Coast Guard, the Coast Guard Auxiliary, the National Weather Service, Corps of Engineers, United States Power Squadrons, most of the yacht clubs in the Chesapeake Bay area, and hundreds of individuals. The *Guide for Cruising Maryland Waters* is published by the Boating Liaison Office.

Commercial Fisheries Liaison Commercial Fisheries maintains liaison with the commercial fisheries industry in Maryland. This involves coordination with the State Health Department, the State Department of Economic Development, the Environmental Protection Agency and the University of Maryland Sea Grant Program. The *Commercial Fisheries News* is distributed free to 30,000 subscribers.

Office of Recreation and Leisure Services The Office of Recreation and Leisure Services is administered by the Extension Service to provide technical assistance to other state units, counties, municipalities, organizations and individuals in planning and organizing recreational departments, facilities and programs. A resource library is maintained to provide research material for interested parties. In addition, a statewide personnel referral program is offered to match recreation professionals with existing vacant positions available throughout the state. Surveys, a newsletter and a legislative brochure are produced.

NATURAL RESOURCES INFORMATION

Natural Resources Information serves as a public interest center for the Department of Natural Resources. It is the principal departmental area where the public, including the media, obtains information about Maryland's natural resources activities. It is responsible for public informational and educational materials emanating from all agencies of the Department. It also provides consulting services to the public participation programs of the Water Resources, Energy and Coastal Zone and Capital Program Administrations.

It accomplished its mission during FY 1978 by the use of traditional communications tools — media releases, public service spots on radio and television, publication of brochures and pamphlets, direct mail, telephone response, circulation of motion pictures and public speeches.

The Natural Resources Information unit of the Office of the Secretary consists of these sections: General Direction, *Maryland Conservationist Magazine*, Sport Fishing, Public Services and the Library.

General Direction The Office of the Chief of Natural Resources Information is responsible for the supervision of the administration of the information unit. Among responsibilities is the processing of all mail addressed to the Secretary of Natural Resources and to the Governor of Maryland when it pertains to natural resources matters. Responsibility for maintenance of contact with news media and officials of other federal, state, county and public agencies is centered in the office which must be aware of current issues and developments in environmental matters.

The office also has specific responsibility for dissemination of information on the Fisheries Administration, Wildlife Administration, Natural Resources Police, Licensing and Consumer Services, Geological Survey and Office of the Secretary.

The office coordinates the department Print Shop, assuring a steady flow of work and accuracy in billing by the Department of General Services, provides circulation management for the *Maryland Conservationist Magazine*; coordinates annual Migratory Waterfowl Stamp and the Trout Stamp contests, has responsibility for printing, up-dating and revising the departmental directory and the DNR section of the State Marcom directory, prepares and implements the NRI budget, gives general supervision to secretarial staff, maintains inventory of saleable publications, and compiles the DNR News, an in-house compilation of newspaper clippings.

Library The DNR Library is charged with providing information service to the DNR staff and general public. Activities include maintaining and circulating the agency film collection, organizing the book collection, acting as a repository for agency publications, participating in interlibrary loans, and offering technical and reference assistance whenever possible.

The agency film collection consists of about fifty titles on fish, game and conservation. Films were loaned to the public more than 650 times in FY 78, a 5% increase over last year.

Subject areas covered in the library collection are the biology, fisheries, water quality and geology of Maryland, with special emphasis on the Chesapeake Bay. The library staff processed and catalogued over 4,000 items this year including publications of institutions such as the U.S. Army Corps of Engineers, Chesapeake Bay Institute, and Chesapeake Research Consortium. DNR publications on file number more than 900 and are available to the public to use in-house or on an inter-library loan basis.

Circulation of library materials averaged 60 items per month reflecting an increase of almost 20% over the previous year.

Inter-library cooperation plays a key role in the librarian's efforts to meet the information needs of the agency. In FY 78, the number of requests made by the staff to borrow materials from universities, research groups and government more than doubled. Of the 284 requests handled by the library, 75% received a positive response.

Technical assistance offered by the library includes locating bibliographic information for the staff, publishing the library newsletter, processing books ordered by individual departments, posting news releases and publications lists, and referring library users to sources of information.

Sport Fishing The Sport Fishing section of Natural Resources Information represents the department at sport fishing and recreation oriented exhibitions, shows, fairs, and tournaments. It is responsible for accurately informing and educating sport fishers and the general public of the status of the sport fishery resources and other water related sports and recreation. It maintains contact with outdoor writers and conducts the fresh and salt water Maryland fishing tournaments.

Public Services This section consists of one public affairs officer, two public affairs specialists and two secretaries. The public affairs officer acts as second in command of the Natural Resources Information Section and serves as public information officer for Maryland Environmental Service, Park Service and Capital Programs Administration. The officer is also responsible for preparing the Annual Activities Report for the Department of Natural Resources and the Monthly DNR Calendar of Events. The public affairs specialists serve as public information specialists for the Water Resources Administration, Energy and Coastal Zone Administration and the Forest Service.

Maryland Conservationist The editor of the *Maryland Conservationist Magazine*, published six times a year, is responsible for all aspects of the magazine's publication, editing, layout, photos, publicity and contact with writers, photographers and artists.

Graphic Services Two illustrators provide graphic arts services for the agencies of the Department, producing publications, exhibits, etc.

LEGAL SECTION

The Legal Section is comprised of eight Assistant Attorneys General, one of whom acts as Counsel to the Secretary of Natural Resources and is responsible to the Attorney General for the direction and supervision of the entire section. Seven of the assistants work in Annapolis and one is located at the Regional Service Center in Cumberland, Maryland. The legal staff not only represents all of the agencies within the Department when they become involved in litigation, but also supplies all legal advice and approvals inherent in the normal functioning of the Department, such as contracts and regulations approval, interpretation of statutes and regulations, and representation of agency units at administrative hearings.

During Fiscal Year 1978 the attorneys assigned to the Department continued their active role in the formulation and enforcement of laws protecting and preserving the natural resources of the State. The staff initiated 27 cases at the Circuit Court level, closed 31 cases and prosecuted 30 violations in the District Courts. Assistance and advice was rendered in numerous administrative proceedings, including 12 formal adjudicatory hearings.

The Legal Section continued to pursue litigation seeking to end the issuance of ocean dumping permits issued by the Environmental Protection Agency to the

cities of Philadelphia and Camden.

The largest penalty ever collected for pollution from an industry in the State of Maryland was collected from the Bethlehem Steel Company. The terms of the consent decree negotiated by the Attorney General's office not only provided for a five hundred thousand dollar civil penalty, but imposed absolute deadlines on the company for the installation of modern pollution abatement equipment including innovative treatment facilities.

ASSISTANT SECRETARY FOR ENVIRONMENTAL MATTERS

The Assistant Secretary for Environmental Matters represents the Department in a number of activities involving environmental management at the state, regional, and national level. He serves as a member or officer of interstate commissions, regional councils, national associations, and technical work groups dealing with water resources and related environmental affairs. As part of his current duties, he serves as chairman of the *Susquehanna River Basin Commission*, and as chairman of the *Southern Environmental Resources Conference*, which is an affiliate of the *Council of State Governments*. He is a member of the *Interstate Commission on the Potomac River Basin*, the *Potomac River Basin Advisory Committee* and the *Ohio River Basin Commission*. He is an executive officer of the *Interstate Conference on Water Problems*. He serves as the Governor's representative on the *Subcommittee on Water Management* of the *National Governor's Association*.

The Assistant Secretary also represents the state and region on a number of scientific committees and technical boards. He represents the Department of Natural Resources as a board member on the *Board of Certification of Superintendents for Water, Wastewater, and Industrial Wastewater Works*.

In his role as the representative of the Acting Governor on the *Subcommittee on Water Management*, he helped develop a set of water policy principles which was adopted by the National Governors' Association and published as "*Fundamental Principles for a National Water Policy*," and which served as a basis for the development of a National Water Policy announced by President Carter on June 6, 1978.

The Assistant Secretary also coordinates Departmental review of all projects assessed for environmental impact pursuant to U.S. Office of Management and Budget Circular A-95.

CAPITAL PROGRAMS ADMINISTRATION

	Budget
General Funds	\$1,286,874
Special Funds	4,010,649
Federal Funds	<u>261,777</u>
TOTAL	\$5,559,300
 Number of Staff	 100

The Capital Programs Administration includes four programs Land Planning Services, Program Open Space, Waterway Improvements, and Shore Erosion Control. Under the direction of the Assistant Secretary and four program directors, this administration provides planning services for state parks, natural resources management areas and recreational facilities; it administers funds of Program Open Space under provisions of the *Outdoor Recreation Land Loan of 1969*; provides Shore Erosion Control services to public and private landowners; and develops Waterway Improvements for the benefit of the general boating public and for general waterway maintenance.

LAND PLANNING SERVICES

This Section is responsible for the planning related to the acquisition and development of public lands administered by the Department of Natural Resources. It is also responsible for the implementation of the *Wild and Scenic Rivers Act, Title 8, Natural Resources Article*. It also performs environmental evaluation of all Department of Natural Resources capital projects in compliance with the *Maryland Environmental Policy Act*. Finally, it performs numerous coordinating functions that relate DNR Lands to county plans, transportation plans, disposal of surplus federal lands, designation of critical areas under the *Land-use Act*, and administration of the *Wildlands Act*.

The work of this Section is divided into four major activities, which are: park master planning; Scenic Rivers Program; acquisition mapping; environmental review projects. Approximately 60 percent of the time

of the section is devoted to the production of State Park Master Plans. This involves extensive field study, design planning, public participation in planning (through advisory committees, public meetings and workshops), recreation demand assessment and coordination with other units of government. The products are plans that are broadly acceptable to the community, that are compatible with the environment, that provide useful and attractive parks of good design, and that make reasonable and efficient use of public monies for capital development. Twenty percent of staff time goes toward the preparation and revision of acquisition maps to guide acquisition of all DNR properties. The Scenic Rivers Program involves approximately 10 percent of staff time and environmental review 10 percent.

The planning process is evaluated by measuring staff time in relation to units of work produced. This is compared to the cost of similar services if contracted from a private planning and design firm. In general, the Section provides planning services and products at roughly 50 percent of the cost of a private supplier.

Park Master Planning

Susquehanna State Park

4 *Advisory Committee* meetings and 1 public hearing were held. A special hearing was conducted on the proposal to include land along Octoraro Creek. The published master plan should be available in the early part of fiscal 1979.

Patapsco State Park

2 *Advisory Committee* meetings and 3 public hearings were held. The draft master plan was completed and presented at three public hearings conducted in December 1977. The master plan should be completed and published in the early part of fiscal 1979.

Calvert Cliffs State Park

The draft master plan update was prepared for review; pertinent data, necessary background studies, and site inspections were conducted; preliminary layouts of development proposals were prepared. The updated plan should be completed in fiscal 1979.

Gunpowder Falls State Park

9 *Advisory Committee* meetings were held and 5 field trips were conducted. The Gunpowder Falls State Park Citizens Advisory Committee was chosen in December of 1977 and began work in February 1978. To date they have reviewed the preliminary concept plan and are offering suggestions for additions and changes.

Hart Miller Island State Park

4 Task Force meetings were held. A draft interim management plan has been prepared for the beach area. A *Technical Advisory Committee* will assist in the preparation of an Interim Management and concept for the diked disposal area.

Mattawoman Natural Environment Area

6 Advisory Committee meetings and 5 Task Force meetings were held. The Draft Interim Management Plan has been completed and reviewed by the *Citizens Advisory Committee*; the final report should be available in early fiscal 1979.

Scenic and Wild River Program

Deer Creek

- A. Status: plan completed May 1978.
- B. Future Work: support proposed county ordinance.

Severn River

- A. Status: plan outline has been approved. Appendix is in draft form.
- B. Future Work: literature and field research, writing, policy development.

Anacostia River

- A. Status: draft scope of work has been prepared by *Joint Committee on Anacostia (MNCPP & WSSC)*.

Monocacy River

- A. Status: resource inventory is being compiled and keypunched by University of Maryland.

Youghiogheny River

- A. Status: the local *Advisory Board* has met to consider the proposed amendments to the existing *Wild and Scenic River Regulations*.
- B. Future Work: *Advisory Board* to determine future planning on the Youghiogheny.

Acquisition Mapping

Greenridge	51,477 acres	80% complete
South Mountain	9,000 acres	90% complete
Greenbrier	1,683 acres	75% complete
Patapsco	11,171 acres	50% complete
Pocomoke	1,420 acres	10% complete
Wye Island	3,500 acres	complete
Gunpowder	15,096 acres	complete
Hart Miller Island	137 acres	complete

Environmental Review Over 988 referrals were made to Land Planning Services for review including coordination with DNR agencies, other state, federal or local government agencies or the public.

Environmental impact statements were prepared to accompany grant requests to the Heritage Conservation and Recreation Service for Land and Water Conservation funds for Seneca and Patapsco State Parks.

Environmental Assessments were prepared for: Mt. Nebo Wildlife Management Area, Service Complex; Moxley Tract, Monocacy Natural Resources Management Area; Merkle Wildlife Management Area, Acquisition; and Cedarville Natural Resources Management Area, Visitors Center/Office.

PROGRAM OPEN SPACE

The mission of Program Open Space is to provide public recreational and open space opportunities within the State of Maryland.

Program Open Space coordinates the purchase of Natural Resources lands, coordinates the design and development of Natural Resources lands, and maintains records of all Natural Resources lands and structures. Program Open Space also obtains federal grants for Natural Resources land acquisition and development, administers state and federal grants to Maryland's subdivisions for local recreation and open space, manages three Natural Resources Management Areas, and coordinates development and maintenance of the Helen Avalynne Tawes Garden.

Program Open Space is divided into four projects.

Acquisition and Development

Acquisition The Department of Natural Resources presently owns 292,511 acres of land, apportioned as follows:

State Parks	66,855
State Forests	118,588
Natural Environment Areas	10,622
Natural Resources Management Areas	13,444
Wildlife Management Areas	75,177
Fish Management Areas	900
Energy and Coastal Zone	1,045
Maryland Environmental Trust	5,731
Miscellaneous	149

Land ownership increased in FY 78 by 12,197 acres.

At present, under the *Outdoor Recreation Land Loan*, the Department is receiving approximately

\$12,000,000 a year for the acquisition of land. About 25 percent of these funds are being matched with Federal Land and Water Conservation Funds each year. It is projected that this may be increased to 50 percent in the near future.

Development The agency is responsible for the design and construction of the capital projects for the Department. In fiscal year 1978, the Department started work on 19 projects with a construction cost of \$6,416,199. This is an increase over the last fiscal year by \$4,545,199. During fiscal year 1978, the Department also started design on 16 projects. This is an increase of six projects over fiscal year 1977.

Records and Leases

This project is responsible for the administration of leases for real property, acreage, and miscellaneous properties for the Department of Natural Resources and for maintaining all records on all lands assigned to this Department. Revenue received from these facilities for fiscal year 1978 totals \$433,559 divided as follows: real property - \$191,462; acreage - \$236,721; and barns and miscellaneous - \$5,376.

Contributing to this increase in revenue were new acquisitions that have increased the acreage and improvements available, and the reevaluation of rents for land and improvements which has continued. In the area of rights-of-way, easements, plus administration fees, receipts are \$47,000 per year.

Land Management

Under the land management program, Program Open Space manages four areas - Tawes Garden, Fair Hill, Wye Island, and Monocacy, totalling 9,411 acres. Fair Hill, Wye Island, and Monocacy are presently under interim management plans. Under these plans, the crop land and buildings are rented out while the entire area is being used for a wildlife habitat.

In cooperation with the Department of General Services, Program Open Space coordinates the planning, maintenance, and operation of the Helen Avalynne Tawes Garden, at the Tawes State Office Building Complex in Annapolis. This garden was officially recognized by the Maryland General Assembly in Senate Joint Resolution 56. The Garden was dedicated on May 17, 1977, in honor of Mrs. Tawes, wife of former Governor J. Millard Tawes. A self-guiding trail opened for use during fiscal year 1978. The first full time gardener was hired by Program Open Space to perform sensitive maintenance in the Tawes Garden, and the General Assembly approved \$37,000

for the construction of a raised planter and site improvements. The project is also supported by District II of the Federated Garden Clubs of Maryland.

Grants Since 1966, the Department has administered Maryland's apportionment of Federal Land and Water Conservation Funds totaling \$38,745,760. In 1969, the Maryland General Assembly passed the *Outdoor Recreation Land Loan of 1969*, "Program Open Space." The Department has administered \$110,200,000 in local Program Open Space funds to Maryland's counties, cities, and towns. The Grants Staff of the Department's Program Open Space has also administered other smaller grants from the Federal Departments of Housing and Urban Development and the Office of Economic Development Assistance.

The Grants work objective is two-fold: 1) to obtain federal grants to supplement state Natural Resources acquisition and development and 2) to administer state and federal grants to Maryland's twenty-three counties and 160 municipalities. Supporting work involves project approval, review, and processing of applications; publishing manuals and informational brochures; assisting applicants with applications, processing reimbursements, and maintaining records.

The accompanying charts show an increasing trend in project processing and approval. Seventeen more applications were received in fiscal year 1978 than in fiscal year 1977. Thirty-five more projects were approved in fiscal year 1978 than in fiscal year 1977. The comparison of the unencumbered balances between the two fiscal years demonstrates that even though allocations increased in fiscal year 1978 by 39 percent, the grants staff maintained the same 9 percent unobligated rate in fiscal year 1978 as in fiscal year 1977. These trends indicate a gradual improvement in the overall administration of grants. These improvements have resulted from a streamlining of the Program Open Space application procedure, in addition to improved participation on the part of local applicants.

Program Open Space project officers are responsible for all grant applications within assigned counties or regions. They are master coordinators who dovetail successful grant approvals with proposed State acquisitions and construction. Eight project officers are continually becoming more skilled in grants administration.

Improvements were made in the application and reimbursement processes. Both the Program Open Space Manual and application forms were revised,

streamlined, and reduced in size. The new application form/project agreement eliminated the use of the cumbersome "Management Agreement." A Final Inspection Report was established as well as an Amendment Procedure. A large number of "closed out" files were microfilmed. An improvement in communications with the federal government was achieved when an application control specialist was hired to assist project officers in bringing uniformity to the Federal Land and Water Conservation Fund grant applications.

WATERWAY IMPROVEMENTS

Hydrographic Operations Hydrographic Operations in Fiscal 78 installed and maintained 444 floating regulatory buoys and navigational aids and 163 fixed aids to navigation. Five hundred eighty-seven acres of public oyster grounds were reclassified as Public Clamming Bottom. This section assisted the Fisheries Administration in charting the location and determining the acreage of 8 oyster planting areas, covering 51 acres for seed, 49 acres for dredged shell, and 4 acres for fresh shell. In addition, personnel assisted the Potomac River Fisheries Commission in charting the location and determining the acreage of 6 oyster planting areas covering 140 acres for seed, representing a total of 244 acres surveyed. This section relocated 253 property corners for private oyster ground leases.

A total of 344 boat hours (1,720 staff hours) were spent by the crews of the M/V J. C. Widener and the M/V J. Millard Tawes in ice breaking to keep a channel open to Smith Island and to assist the oyster boats so that they might pursue their livelihood.

Marine Service Operations Marine Service Operations expended \$155,796 for the removal of 183 derelict vessels, 2 piers and numerous pieces of miscellaneous debris weighing 140 tons from Bay waters and its tributaries. Section personnel cleaned and cleared a 30 mile stretch of the Choptank River, from Greensboro to Denton on the Eastern Shore. Dredging projects were completed at Matapeake, Annapolis Harbor and Sandy Point State Park. Two hundred and eight boat hours (832 staff hours) were spent in ice breaking projects. In addition to refurbishing and maintaining all assigned floating equipment, the section completely overhauled the Cambridge Railway so that large vessels belonging to the Department may be hauled and repaired.

Dredging Operations The Dredging Operations section completed five (5) projects valued at \$312,055 consisting of dredging of channels and harbors and constructing jetties and breakwaters. 22 hydrographic surveys were completed, including 7 for other State agencies. Currently, the section has 57 active projects with a construction value of \$6,170,000 in various stages of development.

Waterway Grants and Design Waterway Grants and Design section has completed construction of three Regional Boating Centers, located in the Baltimore Inner Harbor, Sandy Point State Park and Point Lookout State Park, and has also completed Phase I of Smallwood State Park, which consists of launching facilities. Forty-three projects have been completed with a construction value of \$2,240,615 and, currently there are 126 open projects in various stages of development, with a construction value of \$5,418,672.

SHORE EROSION CONTROL

The Shore Erosion Control program, staffed by eleven full-time employees, is responsible for providing financial and technical assistance to waterfront property owners with shore erosion problems on the Chesapeake Bay, its tributaries and the Atlantic coastal region.

Financial assistance through the Shore Erosion Control Construction Loan Fund is provided to qualified property owners for the construction of shore erosion control structures. Under this program interest free loans are provided for a period up to 25 years.

Technical assistance is available to property owners who do not qualify for financial assistance. Aid is rendered in the form of site inspections, technical and permit information, and recommendations on possible solutions and courses of action to resolve specific shore erosion problems.

In conjunction with design and construction tasks, program personnel obtain topographic and hydrographic data at proposed sites for use during the project design phase. During the construction phase an inspector visits the project site frequently to ensure that all work is performed as specified.

During FY 78 quality control procedures were instituted to insure that all treated timber products used in construction met the required specifications. Under these new procedures program personnel inspect all timber products used in shore erosion control work both before and after treatment.

PROGRAM OPEN SPACE GRANT PROGRAM STATUS

Grant Program	Re-ceived	Acq. Projs. Re-ceived	Dev. Projs. Ap-proved	Acq. Projs. Ap-proved	No. of Acres Ap-proved	Dev. Projs. Ap-proved	Total Funds Approved	Total Funds Reimbursed	Unencumbered Balance June 30
Local	FY 77	34	64	40	541.5	83	\$ 8,474,504	\$12,923,679	\$ 7,141,088
POS	FY 78	31	80	46	1,637.8	108	\$ 8,780,061	\$12,110,952	\$ 9,321,025 (Does not include FY 79 Allocation)
Federal	FY 77	4	5	3	1,636.0	5	\$ 3,680,244	\$ 2,366,939	\$ 4,038,605
LWCF	FY 78	4	9	4	1,225.0	8	\$ 5,595,786	\$ 3,876,643	\$ 3,973,276
TOTALS	FY 77	38	69	43	2,177.5	88	\$12,154,748	\$15,290,618	\$11,179,693
	FY 78	35	89	50	2,862.0	116	\$14,375,847	\$15,987,595	\$13,294,301

SUMMARY OF GRANT PROGRAMS

Grant Program	Number of Projs./ Applications	Total Allocations	Amount of Allo-cation Obligated for Projs.	Unencumbered Balance of Allocation	% of Allocation Obligated	Amount of Allocation Reimbursed
Local POS FY 69-FY 78	1,224	\$110,200,000	\$ 86,410,340	\$23,789,660 (Includes FY allocation of \$14,800,000)	78%	\$73,043,310
Federal LWCF FY 65-FY 78	316	\$ 38,745,760	\$ 34,772,484	\$ 3,973,276	89%	\$20,164,448
TOTALS	1,540	\$148,945,760	\$121,182,824	\$27,762,936	81%	\$93,207,758

SHORE EROSION CONTROL PROGRAM

ACCOMPLISHMENTS—FY 78

Technical Assistance Actions	289
SEC Loan Applications Processed	81
Topographic/Hydrographic Surveys	23
Board Feet of Treated Lumber Inspected	120,000
Linear Feet of Treated Wood Piling Inspected	9,000
Construction Inspections	650
Length of Shoreline Protected by:	
Timber Bulkheads	3,167'
Aluminum Bulkheads	1,165'
Steel Bulkheads	242'
Stone Revetments	5,501'
Timber Groins	600'
TOTAL	<u>10,675'</u> or 2.02 Miles

SHORE EROSION CONTROL PROJECT STATUS — FY 78

No. of Projects	Project Status	Property Owners Served	SEC Loans	Other Funds*	Total Const. Cost
32	completed	57	\$ 852,053.53	\$249,146.17	\$1,101,199.70
11	under construction	14	255,899.50	261,652.50	517,552.00
10	under contract	16	365,340.89	18,040.25	383,318.14
6	contracts pending	9	257,427.00	11,358.00	268,785.00
9	to be bid	20	540,000.00**	21,000.00**	561,000.00**
<u>32</u>	<u>under design</u>	<u>58</u>	<u>2,230,000.00**</u>	<u>52,000.00**</u>	<u>2,282,000.00**</u>
100		174***	\$4,500,720.92	\$613,196.92	\$5,113,917.84

* Special appropriations and property owner contributions.

** Estimated costs.

*** Includes projects for the towns of Ocean City, Chesapeake Beach, North Beach, the community of Fairhaven, and two SEC districts serving numerous property owners.

WATER RESOURCES ADMINISTRATION

Budget	
General Funds	\$2,751,733
Special Funds	739,725
Federal Funds	<u>1,063,231</u>
TOTAL	\$4,554,689
Number of Staff	185

The Water Resources Administration is responsible for the protection, management and enhancement of the water resources of the state. Through a Permit program and an Enforcement program, the Administration seeks to insure the quality and quantity of the waters of the state for all legitimate uses. The Technical Services program includes Laboratory, Water Quality, Flood Control, Dam Safety, and Planning Services.

GENERAL DIRECTION

This activity is responsible for the overall direction, supervision and coordination of activities within the Administration. It also coordinated the Administration's review of 177 State Clearinghouse projects in FY 78.

PERMITS

This program is responsible for the issuance of all permits, certifications, and approvals pursuant to Water Resources law and regulations, and is divided into six major projects: General Administration, Wetlands, Hazardous and Industrial Wastes, Municipal and Agricultural Discharges, Water Supply, and Watershed.

General Administration This office is responsible for the coordination of regulatory as well as administrative functions of the five sections within the Permits Division. It schedules, arranges for publication of notices, and conducts hearings on most applications for permits, and on proposed regulations.

Wetlands Permits Section This section regulates activities in the tidal wetlands — both the submerged and adjacent land areas supporting aquatic growth. State wetlands are those below the mean high water line; private wetlands are those above the mean high water line. The section 1) issues wetlands permits and approvals for the regulation of dredging and filling in private wetlands; 2) makes recommendations to the State Board of Public Works on issuance of wetlands licenses by that authority for similar type works in state wetlands; 3) issues certifications to federal agencies on the impact on water quality of proposed projects involving dredging or filling in navigable waters; and 4) reviews and comments on all other applications for Corps of Engineers' permits to place any fixed works in waterways.

The permit and licensing procedures in these activities involve site inspections, evaluations and public hearings. In addition, the program provides advisory service to prospective applicants on modifications and alternatives which will minimize the adverse effects on the environment.

This section has developed and manages a state program on dredging and spoil disposal activities in Maryland's waters — to monitor such activities, and to investigate alternate and beneficial uses of dredged spoil.

The following reports were published by the Wetlands Permits Section:

1. *Atlas of Vascular Plant Species Distribution Maps for Tidewater Maryland.*
2. *A Review of the Biology, Ecology, and Management of Scirpus olneyi.*
3. *Bibliography of Maryland's Tidal Wetlands (Marshes - Swamps).*

Watershed Permits Section This section regulates, through several types of permits, the construction, reconstruction and repair activities in non-tidal waters and within the 100 year floodplain; the surface mining of minerals other than coal, both the operations and reclamation of lands affected; the sediment control plan approval for state projects; and the review and approval of county and municipal sediment control programs. The types of approvals issued are:

- Small pond permits
- Waterway Construction permits
- Waterway Obstruction permits
- Temporary Waterway Construction permits
- Erosion and Sediment Control approvals
- Maintenance and Repair approvals
- Surface Mining licenses
- Surface Mining permits

Personnel in the section make site inspections, conduct technical evaluation and review of proposed projects and hold public hearings. In addition, advisory service is provided to prospective applicants on measures and alternatives to proposed works which will minimize the adverse affects on the environment.

In continuance of the effort of the preceding year to have counties and municipalities implement soil and shore erosion control programs incorporating state criteria and policy, numerous public hearings and meetings were held by the Administration in these subdivisions. The Administration issued a Watershed Management Policy which provides for a coordinated effort in floodplain management, storm water management, flood control, and agricultural drainage activities.

The following reports were published by the Watershed Permits Section:

1. *Erosion and Sediment Control Design.*
2. *Economic and Environmental Considerations in Controlling Erosion and Sedimentation on Construction Sites.*

Hazardous and Industrial Wastes Permits Section This section has primary responsibility for issuing and re-evaluating State and National Pollutant Discharge Elimination System (NPDES) permits to industrial and commercial facilities, as well as implementation of the Hazardous Substances Control Program. This program issues permits for disposal of hazardous wastes, and certifies and licenses haulers. A waste manifest system is operated. The section manages the Hazardous Substances Control Fund, a special fund receiving money from permit fees and other assessments levied on permit holders. In addition, the section, through designation by the Acting Governor, was directed to implement the requirements of the *Federal Resource Conservation and Recovery Act of 1976 (RCRA)* in the state. This task involves development of a state solid waste plan and a program for the control of toxic and hazardous wastes. These tasks are being integrated with existing Administration programs.

Other duties and responsibilities in the section include:

1. reviewing and commenting on compliance plans submitted in accordance with issued discharge permits as well as orders issued by the Administration's Enforcement Division;
2. issuing "need and adequacy statements" to the Small Business Administration to enable applicants to obtain loans for pollution control purposes;
3. issuing permits for use of toxic materials for aquatic life management purposes;
4. evaluation of effects of discharges on receiving streams and evaluating various treatment technologies;
5. evaluating thermal impact studies from power plants or other sources of thermal pollution; and
6. evaluating toxicity studies submitted as a condition to issuance of a discharge permit.

The following reports were published by the Hazardous and Industrial Wastes Section:

1. *A Hydrogeological Investigation of the Hawkins Point Chrome Ore Tailings Disposal Site.*
2. *A Field Reconnaissance Investigation of Sanitary Landfills in Maryland with Respect to Impact on Surface Water.*

Municipal and Agricultural Discharges Permits

Section This section is responsible for managing the discharge of domestic and agricultural wastewater in a manner that will assure the protection and enhancement of the state's ground and surface water resources. The principal regulatory tools used to carry out this responsibility are the State and NPDES discharge permits. In addition to issuing discharge permits the section performs a variety of review and advisory functions. Duties and responsibilities of the section are:

1. issuance of combined State and National Pollutant Discharge Elimination System (NPDES) discharge permits for municipal and agricultural point source wastewater discharges to surface waters;
2. issuance of state discharge permits for municipal and agricultural wastewater discharges to the land;
3. review and issuance of state approvals for agricultural waste and wastewater disposal activities in accordance with an Administration and Soil Conservation Service cooperative agreement;
4. review and evaluation of the effects of proposed wastewater discharges on the quality of ground and surface waters in association with the development of Section 201, *Clean Water Act*, Facilities Plans;
5. review and evaluation of requests for significant modifications to issued State and NPDES discharge permits;
6. review of State Clearinghouse projects related to wastewater treatment and collection systems;
7. providing technical assistance in certain enforcement actions involving municipal and agricultural facilities; and
8. review and evaluation of pretreatment ordinances required by the NPDES permits.

Water Supply Permits Section This section is responsible for the state's water supply planning as well as for the issuance of two types of permits: 1) Well Construction Permits, and 2) Water Appropriation and Use Permits for groundwater and surface water. Issuance of these permits involves a technical evaluation of the environmental impact of well drilling activities and withdrawals of underground and surface water, the evaluation of the adequacy of the water supply used or proposed for use by municipalities, industries and commercial facilities, and the impacts of proposed withdrawals on existing water users.

Responsibilities of the section include: the recordation and evaluation of water rights; groundwater and surface water use and quality data and other hydrogeologic data from wells and hydrologic data

from streams; the triennial review of groundwater and surface water appropriations; and holding of public hearings.

The section has been working with federal, state and local agencies to solve water supply problems:

1. *The Potomac River Low Flow Allocation Agreement* signed on January 11, 1978 by the District of Columbia, U.S. Army Corps of Engineers, Commonwealth of Virginia, *Fairfax County Water Authority*, *Washington Suburban Sanitary Commission* and the State of Maryland. The Agreement provides for the equitable sharing of the water supply during drought periods when the flow of the Potomac River is too low to meet all water supply demands.

2. The section was represented on the Washington Metropolitan Area Council of Governments' task force for water supply emergency planning.

3. Review of the water supply portion of annual updates to county water and sewerage plans is an ongoing activity that affects nearly all public water supply projects.

The following reports were published:

1. *Water Allocation Guidelines for Deer Creek, Maryland.*
2. *Status Underground Water Sources on Delmarva.*
3. *Yield Testing of Domestic Wells in Maryland.*
4. *Maryland's Water Allocation Program.*

TECHNICAL SERVICES

This program is responsible for providing technical support for state water quality programs, encompassing five primary work projects: 1) Laboratory Services; 2) Water Quality Services; 3) Flood Management; 4) Dam Safety; and 5) Planning

Laboratory Services Section The Laboratory Services Section performs chemical, physical and bacteriological analyses of water, wastewater, sediments and aquatic life for the programs of the Administration and other agencies within the Department of Natural Resources. The main laboratory facilities are located in Annapolis and a regional laboratory is located in Cumberland.

The Section 208, *Clean Water Act*, studies for Jones Falls and the Patuxent River were two major water quality surveys supported by the laboratory this year. There were many other less intensive surveys that required chemical analyses, including the Trend Surveys, Hart & Miller Island monitoring activities, Chesapeake Bay Earth Science Study and various

other smaller surveys. Along with work on water quality surveys the laboratory also provided support to the Enforcement Division, the several permit issuance sections, Fisheries Administration, Capital Programs Administration, Maryland Environmental Service and U.S. Army Corps of Engineers as required in conjunction with their enforcement and monitoring activities.

The laboratory has increased its capabilities for sediment analysis, identification and determination of organic compounds and trace metal analysis.

Water Quality Services Section The Water Quality Services Section is responsible for technical support services including surveys and investigations to determine cause and effect relationships on water quality. Included in the effort are studies to identify and quantify the chemical, physical, biological and hydrological characteristics, to assess current conditions and to determine needs and justification for water quality control. Close liaison is maintained with the Enforcement, Permit and Planning activities of the Administration so that their needs for water quality information may be addressed. Also, coordination of this activity area is maintained with the Maryland Environmental Service as well as the Federal Environmental Protection Agency.

Water Quality Services functions in two major areas: state-wide Trend Sampling and geographically selected Intensive Studies. The state-wide Trend Sampling is designed to provide data for evaluating water quality changes over both the short and long term.

Trend Sampling was conducted at approximately 150 stations which make up the state's baseline monitoring network. These stations were sampled on an adjusted bimonthly schedule to cover the environmentally critical periods of the year. In addition, in October 1977, sampling at 30 selected stations was initiated as a part of the federally mandated nationwide "Basic Water Monitoring Program" and continued on a monthly basis during the remainder of the year.

The Intensive Studies, programmed to cover the state's waters during each five-year period, concentrate on determining the effect of alternate wastewater management methods on the water quality of the state's water; determining the effectiveness of pollution control facilities; and determining the causes for and extent of water quality problems in general. Virtually all the effort of the Water Quality Services Section's Intensive Studies was devoted to a major, comprehensive study of the Patuxent River to provide information

necessary to effectively devise a management strategy for this area.

The Water Quality Services section published the following reports:

1. *Trappe Creek - An Evaluation of Water Quality and Waste Discharge Impact.*
2. *Jenkins Creek - An Evaluation of Water Quality and Waste Discharge Impact.*
3. *Measurement of Tides and Currents in Kent Island Narrows.*
4. *Intensive Hydrographical and Water Quality Survey of the Chincoteague/Sinepuxent/Assawoman Bay Systems.*
Volume I. Study Program.
Volume II. Data Report: Intensive, Hydrographical and Water Quality.
Volume III. Non-Point Source Pollution Studies in the Chincoteague Bay System.
5. *LaTrappe Creek — An Evaluation of Water Quality and Waste Discharge Impact.*
6. *Back River — An Assessment of Water Quality and Related Fish Mortalities.*

Flood Management Section The Flood Management Section has responsibilities which include;

1. coordination and promotion of the National Flood Insurance Program;
2. technical assistance to local subdivisions including writing of local ordinances, watershed modelling, and all matters related to flooding, flood control and storm management;
3. flood plain delineations; and
4. development of hydrologic data and methods of handling floods.

The *Flood Hazard Management Act of 1976* mandated comprehensive planning and design of flood management programs. The comprehensive phase of this law was modified in 1977 to lend assistance to the counties in developing their flood management plans. This required the initiation of flood studies over a larger area of the State.

The section is presently coordinating the National Flood Insurance Program for some 115 participating Maryland communities.

Dam Safety Section Existing state law with respect to dams had been implemented by the Watershed Permit Section. With the enactment of a federal dam safety program in FY 1978, the Administration created a separate Dam Safety Section to coordinate the state-federal activities in this area. The state and the U.S. Army Corps of Engineers are required to evaluate and report on certain type dams in Maryland within a 3 year period. The number of Type 1 (high hazard) dams to undergo the joint Phase 1 inspection during the 3 year period is 36.

Planning The Planning section is responsible for implementing the water quality management planning provisions of the *Federal Water Pollution Control Act* Amendments of 1972 and *Clean Water Act* of 1977. During FY 1978 the section was also the lead unit for implementation of the Resource Conservation and Recovery Act of 1976.

Planning responsibilities accomplished pursuant to the *Clean Water Act* (principally Sections 303(e) and 208) include:

1. development of statewide approach to water quality management and planning, to include both state and designated agency (Regional Planning Council and Council of Governments) planning efforts. Program elements pulled together in this area include procedures for development of the state and *EPA Agreement*, the Section 305(b) report basin summaries and policy memoranda on Sections 208/201 coordination.
2. development of specific programs and implementation agreements necessary to control sources of water pollution. During FY 1978, the staff worked to ensure implementation of Section 303(e) river basin plans completed in FY 1977. EPA staff used the plans as the basis for administering grants for treatment works. The second phase of the program is to be completed in June of 1979 with state adoption of Section 208 plans for each river basin. FY 1978 saw a major effort by the staff to develop and institute improved management programs and activities especially as related to erosion. Completed drafts of the Section 208 river basin plans will be available in November of 1978.
3. in the Washington and Baltimore metropolitan areas, review and certification of the designated agencies' Section 208 plans and grant applications prior to their submittal to EPA. The staff provides guidance and support consistent with the statewide approach to water quality management planning.

In addition to planning responsibilities mandated by the *Federal Clean Water Act* and regulations, the planning staff reviews and provides appropriate comments on Section 201 facility plans, county comprehensive water and sewer plans, and State Clearinghouse projects. The section participates in the state's sewage construction grants program and provides an annual review of water quality and project effectiveness for use in the preparation of the state's construction grants priority list.

Highlights for FY 1978 include:

1. A close working relationship with the agricultural community was developed to promote the implementation of the resulting program;
2. WRA participated with ASCS in priority spending through the Agricultural Cost-sharing Program in various counties;
3. An inventory of water uses throughout the state as impacted by water quality problems was developed and used in selection of priority areas for Section 208 field investigations and published as the "*Interim Report*", January, 1978;
4. Inventories of water quality problems and contributing land-based activities including seasonality were prepared;
5. Information collection for rough assessments of urban runoff pollution loads was initiated for the Hagerstown and Chestertown areas;
6. 14 public advisory councils and governmental policy groups continued to work on water quality management planning, meeting approximately monthly with the staff;
7. Contracts were initiated with 13 local soil conservation districts to generate detailed mapping inventories of land use and management activities and to report findings in aggregate form to the Administration. The staff coordinated the conduct of this work;
8. The staff participated with a technical team in the development of a water quality management program for agricultural land under the initiative of an Ad Hoc agricultural Section 208 Committee and the State Soil Conservation Committee.
9. Technical scopes of work were developed for nonpoint source field assessments in priority watersheds, should EPA funding become available;
10. *Resource Conservation and Recovery Act* accomplishments included: review of each of the local jurisdiction's comprehensive solid waste management plans; holding of public hearings on the state's approach to RCRA implementation; and holding of meetings of interagency RCRA task force.

Published Reports of the Planning Section include:

PL 92-500 and Abandoned Mine Drainage Control, Maryland's 208 Program, Water Quality 1977, the state's Section 305(b) report Approach for Analysing and Managing Agricultural Nonpoint Sources in the State of Maryland.

ENFORCEMENT

This program is responsible for the enforcement of oil control activities; for the inspection and enforcement activities of the Administration and the Bureau of Mines under the authorization of the *Natural Resources Articles 7, 8 and 9* and subsequently adopted regulations. Specific program activities and related workloads are summarized in the tables.

The Enforcement Program is organized into five field regions: Western Maryland, Central Maryland, North-east Maryland, Southern Maryland, and Eastern Maryland. Program personnel conduct periodic and unscheduled surveillance by ground and air. Enforcement actions, either administrative or legal, are based on nature, extent and impact of the violations. Primary emphasis is given to direct "in the field" corrective action. A 24-hour duty roster is maintained through the Department of Natural Resources Police Radio Watch to handle emergency water pollution problems.

Oil Control The Oil Control Section, as part of the Enforcement Program, is responsible for the issuance of 1) Oil Operations Permits 2) Oil Vehicle Operator's Certificates and 3) Oil Terminal Facility Licenses, as well as for related follow-up field enforcement work.

The section is supported by the Maryland Oil Disaster Containment, Clean-up and Contingency Fund. This fund is maintained by license fees charged for oil storage facilities of over 3,000 barrels capacity. With these funds the section has purchased equipment and has developed emergency response capability with both land and waterborne facilities and manpower to contain and clean up oil spills in and near the waters of the state. The section responded to 429 oil spills during the fiscal year.

WATER RESOURCES ADMINISTRATION ACTIVITIES

	FY 77	FY 78
Wetlands Section		
Board of Public Works Licenses	413	366
Department of Natural Resources (DNR) Permits	12	52
DNR Approvals	26	21
Water Quality Certificates	379	337
Water Quality Review, Less Certificates	313	317
TOTAL	1,143	1,093
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Watershed Permits Section		
Small Ponds Permits	3	8
Waterway Construction Permits	201	220
Waterway Obstruction Permits	4	7
Temporary Waterway Construction Permits	91	225
Maintenance and Repair Permits	104	83
Erosion and Sediment Control Approvals	147	113
Surface Mining Licenses	130	47
Surface Mining Permits	63	90
TOTAL	743	793
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Municipal and Agricultural Discharge Permits Section		
Discharge Permits	70	32
Facility Plan Discharge Determinations	90	86
Agricultural Approvals	50	45
Permit Modifications	48	22
Compliance Plan Reviews	5	3
TOTAL	263	184
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Hazardous and Industrial Wastes Section

Discharge Permits	184	118
Permit Modifications	83	30
Toxic Materials Permits	97	96
Compliance Plan Reviews	194	192
Hazardous Substances Hauler Certificates	37	45
Hazardous Substances Vehicle Licenses	—	119
Hazardous Substances Disposal Facility Permits	—	3
TOTAL	595	603

Water Supply Permits Section

Well Permits Issued	13,920	14,707
Appropriation Permits Issued	709	758
Appropriation Permits Modified	77	217
Triennial Reviews of Issued Permits	190	112
TOTAL	14,896	15,794

FY 77 FY 78

Laboratory Services Section

Analyses Performed		
Chemical	112,221	142,557
Bacteriological	4,612	4,593
TOTAL	116,833	147,150

Water Quality Services Section

Surveys* Performed		
State-Wide Trend Sampling (Visits)	1,540	1,580
River Basin Intensive Week-Long Surveys	16	11
TOTAL	1,556	1,591

*Physical/Chemical/Bacteriological

Oil Control Section

Oil Permits Operations	689	279
Oil Terminal Facility Licenses	147	157
Oil Vehicle Operator's Certificates	1,864	1,505

Enforcement Section

Inspections for Non-Permitted Points of Discharge or Pollution Sources	2,869	2,452
Inspections for State Discharge Permits	5,175	5,601
Inspections for Oil Terminal Facility Licenses	306	300
Inspections for Oil Operations Permits	2,666	1,991
Inspections for Toxic Materials Permits	22	20
Inspections for Waterway Permits	2,584	3,027
Inspections for Appropriations Permits	218	185
Inspections for Small Pond Permits	148	110
Inspections for Surface Mining Permits and Licenses	824	1,559
Inspections for Well Permits and Construction	737	1,116
Inspections for State Wetlands Licenses/Permits	3,266	2,491
Inspections for State Sediment Control	1,463	1,405
Inspections for Hazardous Materials Permits	—	7
Other Inspections (Long Range Monitoring and Local Problems)	362	416
TOTAL	20,640	20,680

Complaints Received and Administered	1,057	1,280
Enforcement Action (Administrative and Legal)	963	1,482

MARYLAND PARK SERVICE

	Budget
General Funds	\$4,079,270
Special Funds	1,656,243
Federal Funds	—
TOTAL	\$5,735,513
Number of Staff	244
Seasonal Staff	500

Of the nearly 80,000 acres of public land managed by the Maryland Park Service, 70,000 acres remain in their natural state. The remaining 10,000 acres are improved for public recreational enjoyment. Park improvements include roads, parking lots, buildings, utilities, and those facilities which people associate with state parks, namely, campgrounds, picnic areas, playgrounds, trails and water related facilities. There are 92 miles of paved roads and paved parking lots for 10,000 cars in the parks. Public buildings include comfort stations, bath houses, concessions, pavilions, nature centers, museums, offices, maintenance buildings, storage buildings, contact stations and visitors centers.

Structures on public lands are rented by Maryland Park Service to tenants who reside there. In FY 78 efforts were made to standardize property rentals throughout the state in order to realize an equitable rent from each property. Rental income is earmarked for maintenance to these residences based on health and safety considerations as a first priority. Repairs to sewage systems, electrical systems and boilers are included in maintenance procedures. An annual inspection of all residences is now conducted.

Facilities which provide the general public with a variety of activities are heavily used and in constant demand. The Park Service has 2,334 individual camping sites and a smaller number of sites for organized groups. There are 110 picnic areas and 73 playgrounds. Nature trails and hiking trails extend for 322 miles. Twenty ponds and lakes cover 728 acres. In addition, visitors enjoy the waters of the Atlantic

Ocean, the Chesapeake Bay and selected rivers and streams. Boat launching ramps, boat docking slips and rental boats are available at many of the parks.

FEDERAL PROGRAMS

To assist with the maintenance of the parks' natural resources the Park Service has used the services available through the Youth Conservation Corp (YCC) and the *Comprehensive Employment Training Act (CETA)*. In an eight week program from June to August, 1977, the YCC enrollees and 7 foremen worked at Pocomoke River, Patapsco Valley, Elk Neck, Gunpowder, Rocky Gap and Herrington Manor State Parks and Cedarville Natural Resources Management Area. They accomplished many projects related to environmental protection such as erosion control, renovation of nature trails and campsites, ground and building maintenance and the construction of fire rings, grills and picnic tables. The Park Service expects to use the services provided by the *Young Adult Conservation Corps (YACC)*, another federal program, in FY 1979.

TRAINING

The Park Service has 244 full-time employees and approximately 500 seasonal employees who are hired mainly for the busy summer season. Park employees receive training to assist them in performing their duties in a competent manner.

Interpretive Training In the spring of 1978 all the seasonal employees and the full-time park interpreters attended a weekend training session at Herrington Manor State Park. The training gave all the participants an opportunity to up-grade their skills before the arrival of summer visitors.

Ranger School Ranger School, a training program for park personnel who handle park operations, public relations, and law enforcement, has been held annually since 1965. In the fall of 1977, it was held at Patuxent Naval Air Station in Lexington Park and the Maryland State Police Academy in Pikesville. Thirty rangers participated in the four week long program at Patuxent and fourteen rangers participated in the eight week program at the Police Academy. Park Service personnel instructed the rangers on Park Service matters for four weeks for 160 hours of instruction. The rangers then moved to the Maryland State Police Academy in Pikesville for eight weeks and 320 hours of instruction in law enforcement. The rangers graduated from the Police Academy as commissioned law

enforcement officers empowered to enforce the regulations of the Department of Natural Resources and all state laws including the *Transportation Article* and *Article 27 of the Criminal Code* on properties owned and operated by the Maryland Park Service.

Refresher Courses Annually, the Maryland Park Service provides refresher courses in law enforcement, first aid and CPR. These courses allow employees to improve their law enforcement skills every two years, their first aid every three years, and their CPR every year.

Technician Training Training for park employees who specialize in land and property management was increased in 1978. Several one-day training workshops were conducted in the Spring of 1978. The Park Service was able to take advantage of many workshops sponsored by outside agencies such as the University of Maryland, the Maryland Department of Health, the Maryland Department of Agriculture and the Maryland Recreation and Parks Association. In addition, two workshops were provided by Maryland Park Service personnel. Areas of training included workshops on pesticides, facilities construction, wastewater treatment, turf management, horticulture and electricity.

PROGRAMMING

Nature and history interpretation are the elements used by the Park Service to give park visitors an increased sense of awareness and respect for their environment. The Park Service's interpretive program was begun in 1968 when a prospectus was written which proposed the implementation of an effective, long range interpretive program in the state parks. The goal of this program was to provide the public with a more meaningful and enjoyable park experience by developing a better public understanding of the rich natural and cultural heritage represented by various parks across the state.

The tenth anniversary of the original interpretive prospectus, 1978, was a landmark year for the Maryland Park Service Interpretive Program. Through close interaction with the Capital Programs Administration, seven major interpretive center facilities are well on their way toward development.

Nature Interpretation Interpretive programming is gradually becoming more and more responsive to both the resources of each area and the needs of park visitors. The program is now starting to gear program approach to the individual character of each park area. This approach varies from high intensity recreation areas to areas of quiet solitude and majestic natural splendor.

Interpretive programs and facilities now serve over 200,000 park visitors during the summer season. Program attendance continues to rise in many areas; however, emphasis is gradually shifting from numbers to quality. For example, Pocomoke River State Park had approximately 11,000 interpretive participants in 1977 from June to August. This year, although the attendance for the same period is about 1,000 less, the number of complimentary letters regarding the program has increased significantly.

Historical Interpretation While nearly all the parks have nature interpretive programs, historical interpretive programs are limited to the five state parks with features of historical interest. In the summer of 1977 the following programs took place at these parks:

At Fort Frederick, one full-time ranger interpreter and three summer seasonal historians garrisoned the fort seven days a week demonstrating a number of aspects of 18th Century frontier garrison life. In addition, a group of volunteers in the parks (VIP's) served at the fort on many weekends. Major weekend programs involving large military units were held in July and September (Governor's Firelock Match) and a crafts fair was held in August. In May and June, two more special weekend performances involving outside organizations were held.

At Susquehanna State Park one seasonal historian was hired to conduct tours and demonstrations in the Rock Run Area. The highlight of his activities was the grinding of cornmeal in a water power mill. Other park employees supplemented this program from time to time. During the year, plans were made to move a large agriculture museum from a nearby private estate onto the park. The park staff also continued work on the interior restoration of an 1804 mansion.

At Gathland State Park, arrangements were made with nearby Antietam National Battlefield Park to have an interpreter hold special Sunday afternoon soldier demonstrations at the War Correspondents Arch. The Park Service plans to take over and continue this program in the coming year. Initial planning was undertaken to develop a driving tour of the South Mountain Battlefield. A volunteer group held a weekend long demonstration of Civil War soldier life.

At Smallwood State Park, two seasonal historians provided tours of the restored manor house, colonial candlemaking demonstrations, gardening and cooking in the kitchen area. At the annual Revolutionary War Days weekend in May, numerous crafts-people from all over the east coast demonstrated their skills.

Point Lookout State Park initiated an historical interpretive program with one seasonal historian who dressed alternately in the uniforms of Union and Confederate soldiers to demonstrate various aspects of life in the Point Lookout prisoner of war camp. The park's historical tour was improved with a new guide booklet.

Attendance at historical interpretive programs reflected the interest shown by the public in these events:

Fort Frederick	80,000
Susquehanna	9,000
Gathland	1,500
Smallwood	11,500
Point Lookout	4,000

Special Events In addition to interpretive programming, many of the parks sponsored special event days which allowed visitors to participate in an unusual activity which is not held regularly at the park. These events establish a rapport between the park and the community, and frequently the community is a cosponsor of the event. Some of the events attract visitors statewide as well as tourists passing through.

Several events are held annually. Those which were popular in FY 1978 are:

Special Events	Park	Attendance
Cross Country Ski Race	New Germany	300
Maple Syrup Demonstration	Cunningham Falls	3,500
Easter Egg Hunts	Elk, Neck, Cedarville, Sandy Point	250
Martinak Days	Martinak	3,500
Smallwood Revolutionary War Days	Smallwood	7,600
Mid-Atlantic Championship Bathtub Races	Point Lookout	700

Programming in the parks is frequently enhanced by the volunteers who perform services without pay but are recognized by the Park Service as Volunteers in the Park (VIP). During FY 1978, 66 VIP's performed a variety of duties including interpretive programs, craft programs, and nature trail restoration.

VISITOR PROTECTION AND ASSISTANCE

Because the Maryland Park Service is concerned with the safety and health of the public and its employees, it initiated a comprehensive safety program in early 1978 to be implemented in all the state parks. The goals of the program are to establish safety attitudes and safety habits. The safety program emphasizes training all employees in accident prevention; keeping and updating accurate records and reports; investigation and safety inspections and establishing safety standards.

To insure that park visitors have a safe and trouble-free experience in the parks, the Park Service has trained 115 law enforcement officers and 82 park wardens. These people, who usually serve as park rangers, primarily work as visitor contact personnel, making the park visit a worthwhile experience. They also enforce laws protecting and preserving the parks.

In FY 1978, park personnel responded to:

- 1,685 incidents, of which 461 were for assistance
 - 186 cases of vandalism totaling \$12,000
 - 141 cases of larceny totaling \$14,000
- 1,581 first aid reports
 - 960 citations
- 2,285 warnings

MARYLAND FOREST SERVICE

	Budget
General Funds	\$1,779,207
Special Funds	741,416
Federal Funds	<u>782,317</u>
TOTAL	\$3,302,940
Number of Staff	165

help to protect and preserve the designated Scenic Pocomoke River.

Federal Manpower Programs on State Forests Enrollees of the federally funded Youth Conservation Corps and Comprehensive Education and Training Act programs again took part in state forest projects during 1978.

The Y.C.C. program involves high school students interested in resource conservation. Student enrollees engaged in a work learning experience on several state forests during the summer of 1978 as follows:

Green Ridge State Forest	16 enrollees
Elk Neck State Forest	8 enrollees
Doncaster State Forest	5 enrollees
Pocomoke State Forest	5 enrollees

The Y.C.C. boys and girls completed valuable forest projects in their home counties. Examples of their projects include a new 5½ mile hiking trail, surveying new forest boundaries and constructing a nature trail.

The C.E.T.A. program is more labor-intensive than Y.C.C. and enrollees perform duties similar to regular state forest employees. An example of their work is the recent improvement of the Savage Bridge and White Water Canoe camping areas on Savage River State Forest. These camping areas accommodate canoeists attending the biennial white water canoeing events on Savage River.

Timber Sales Timber prices were higher in 1978, so that even with fewer timber acres sold, forest income was up significantly. Fire wood sales increased in 1978. Citizens are enjoying themselves while cutting their own firewood at a reasonable price; at the same time much low grade timber material is salvaged from the state forests and put to good use.

Timber Stand Improvement The improvement of the state forests by thinning and removing defective diseased trees is a high priority project. Although the total number of acres improved in 1978 was down slightly, the removal of firewood by citizens improved many acres and more than offset the decline.

Reforestation The number of acres of trees planted on state forests in 1978 declined very slightly to 280 acres. It is anticipated that this will rise sharply next year as newly-acquired open areas and timbered areas not planted in 1978 are reforested.

The mission of the Maryland Forest Service is the management of forests and trees and the promotion of their values for the benefit of people.

The system by which the Forest Service seeks to carry out its mission is divided into three main units of activity — State Forest Operations, Resource Protection, and Technical Forestry and Reforestation.

STATE FOREST OPERATIONS

This unit of activity is concerned with acquisition, timber sales, reforestation, maintenance, and the daily operation of the Forest Service.

Ten forested areas totaling 125,115 acres, make up the state forest system. These areas include: *Doncaster State Forest* - 1,485 acres; *Elk Neck State Forest* - 2,996 acres; *Garrett State Forest* - 6,824 acres; *Green Ridge State Forest* - 32,466 acres; *Pocomoke State Forest* - 13,229 acres; *Potomac State Forest* - 10,658 acres; *Savage River State Forest* - 53,064 acres; *Seth State Forest* - 125 acres; *Wicomico State Forest* - 1,110 acres; and the *Cedarville Natural Resources Management Area* - 3,158 acres.

Land Acquisition During 1978, the state forests were enlarged by the acquisition of 3,506 acres, including 1,836 acres for Green Ridge, 1,429 acres for Pocomoke and 241 acres for Savage River State Forest. The Green Ridge acreage will provide additional valuable frontage on the scenic Paw Paw Bends section of the Potomac River, dear to float trippers and canoeists. The Pocomoke addition was obtained through the Nature Conservancy and will

Forest Visitation Forest visitation decreased about 15 percent in 1978. Weather was thought to be the main reason. It is also believed that the camping "boom" is slowing down.

A new state forest camping policy was initiated in the latter part of 1978. The new procedures are aimed at providing a quality camping experience for state forest visitors while protecting the forests from camping over-use and environmental damage.

State Forest Movie A new color motion picture, "A Place in the Forest" was completed and made available to the public in 1978. This 28-minute film was made to inform the public about the state forest management and the many attractions and opportunities of our public forests.

TECHNICAL FORESTRY AND REFORESTATION

Several major elements of the TFR Program combine to improve and maintain the contributions that trees, forests and related resources provide to all citizens. All these efforts are service oriented in nature and are provided upon request to private landowners across the state. Some of the accomplishments are:

Private Woodland Owner Assistance Twenty-two project foresters and eleven foresters' aides, assisted 3,564 woodland owners. Detailed forest resource management plans were developed for 18,000 acres of privately owned land. Nine-hundred tree planting plans were prepared and 2,500 acres were planted or seeded to trees. Eighteen hundred and sixty-five acres were marked for harvest resulting in 7,848,000 board feet of timber being put up for sale.

Watershed Program Technical assistance was provided to landowners within five designated P.L. 566 small watershed projects and the Potomac Flood Control Project under P.L. 534. Both of these laws, provide forest resource management assistance and watershed protection. Forest management plans were prepared for 1,950 acres of forest land and 350 acres were planted.

Direct assistance was provided to the Water Resources Administration's 208 water quality management planning effort. Background and program elements addressing silvicultural nonpoint pollution were provided as well as the development of best management practices for forest harvest operation. Similar assistance was provided to the Baltimore Regional Planning Council's 208 planning efforts.

Forest Conservancy District Boards Forest Conservancy District Boards seek to encourage and assist in the wise use of trees for a multiple variety of benefits. Each county has a board made up of at least five persons from various walks of life. A president and executive committee coordinate state level activities, while each county has a chairperson to coordinate county activities. The project forester in each county is the secretary to the board and is responsible for board administration.

Nursery The Buckingham Forest Tree Nursery produces the seedlings for the forestation program and those for the Wildlife Administration; 127,000 hardwood, 2,336,148 softwood, 105,755 wildlife shrubs and 2,700 roadside trees were produced.

The physical plant and equipment have been upgraded by completion of an office to better serve the public and by increased mechanization in the growing, grading and handling of plant materials. Old and inefficient irrigation pipes are being replaced over a three-year period. Much of this work is timely, considering the anticipated increased production required to meet the needs of the Pine Tree Reforestation Law.

Urban and Community Forestry The Southern Maryland Rural Conservation and Development Project continued with the support of an urban forester in the Tri-County Southern Maryland area. Approximately 200 individuals, developers, planning agencies and local groups were assisted in such activities as the establishment, protection, retention and care of trees in urbanizing areas.

Federal cost-sharing became available in this year, and the MFS has employed a person to develop and administer a federally-funded Urban and Community Forestry Program.

Forest Products Utilization For the first time, four forest products utilization specialists worked a full year. It is felt that this approach is the most efficient method of operation. Efforts were directed to and accomplishments made in harvesting, sawmilling, processing and machining, drying, wood energy, residue utilization, marketing and general forest products utilization.

The type of service varied widely within the program: assists were rendered to 1,134 persons or groups and involved 22,376 board feet with a value in excess of \$4,600,000.

Sawmill Improvement Program (SIP)	20 studies
Rough-Mill Improvement Program (RIP)	4 studies
Improved Harvesting Program (IHP)	
Logged Area Analysis	3 studies
Felling and Bucking	7 studies

Forest Resource Planning Recent federal legislation provided funding through the USDA Forest Service for state comprehensive forest resource planning. As a result, a forest resource planner has been employed to develop the framework for a comprehensive forest resource assessment and program planning effort in Maryland. The multi-year, dynamic planning process will enable the MFS to assess current and projected supply and demand situations for a broad spectrum of forest resources and to formulate alternative programs that will provide the agency with future resource policy direction. A public involvement plan was developed to allow the citizens of Maryland to participate in the planning process. A critical part of the pre-planning effort was development of the Maryland Forest Resource Planning Act which will be submitted to the General Assembly. Passage of the Act will formalize the planning process by making it a continuing part of the MFS's responsibilities and by linking it to the annual budgeting process.

RESOURCE PROTECTION

This program is responsible for protection of 2,706,000 woodland acres and 994,000 non-forested watershed acres, valued at \$1,647,712,074 in 1972 dollars.

The drought cycle continued through the first half of fiscal year 1978 and then broke in January. Since that time, there have been normal, or above normal, amounts of precipitation. Even with the amount of precipitation received, there were two extended periods in April when dry conditions and severe fire weather occurred. The normal precipitation is readily evident in a comparison of the fire danger class days of 1977 with those in 1978. The more normal fire season is also reflected in the fire statistics as compared in 1977.

The three main causes of wildfire in 1977 were incendiary, children and debris burning. These remained the three main causes in 1978 with the following numbers: incendiary — 149; children — 115; debris burning — 69.

Maryland assisted the United States Forest Service once again in 1978 by providing 40 firefighters to suppress large western forest fires. This time MFS was called upon for a two week period to help on the Marble Cone fire in California. The Forest Service also participated in the annual Middle Atlantic Interstate Forest Fire Compact training meeting held at Camp Caesar, West Virginia.

The Rural Community Fire Protection project continued in 1978 with \$35,700 of federal funds being committed to assist with the training and equipping of rural fire companies throughout the state.

Insect and Disease The Forest Protection Program also includes Insect and Disease detection and control. Most of the time spent in this phase was in gypsy moth detection and reporting. In this activity, the Forest Service assists and cooperates with the Maryland Department of Agriculture. Over 700 hours were spent in this activity protecting 294,000 acres. MFS is also responsible for detecting and reporting all other forest insect and disease activity throughout the state.

Another activity has been the Junior Forest Ranger Program. A total of 2,655 Junior Forest Rangers were appointed in 1978.

Roadside Tree Program The roadside tree program is responsible for the protection of all trees growing within the rights-of-way of any public road. The utility companies' overhead and underground line construction and maintenance, occurring on rights-of-way, is supervised by the 17 roadside tree personnel of the Maryland Forest Service. Assistance is also offered to state and county roads departments, municipalities, public-owned or controlled utilities, improvement associations, contractors, and private homeowners on tree care and maintenance requirements.

The Maryland Forest Service also furnished 2,700 shade trees at a nominal cost to communities for roadside beautification. These trees must be planted on public rights-of-way.

Sixty-one applicants for tree expert licenses were examined and 15 were licensed. Revenue from this activity was \$2,090.

**TECHNICAL FORESTRY AND
REFORESTATION ACCOMPLISHMENTS**

	FY 77	FY 78
Planting		
Tree seedlings distributed	2,759,323	
Number of areas planted	1,177	752
Acres planted	3,056	2,884
Management Assistance		
Requests serviced	6,660	3,564
Management plans prepared (acres)	26,476	21,774
Sawtimber harvest (Mbf)	6,483	11,527
Pulpwood harvest (cords)	31,644	25,662
Timber stand improvement (acres)	1,216	1,333
Site preparation (acres)	2,026	2,083
Stabilization of soil (acres)	6	395
Fire roads and trails constructed (feet)	59,578	7,800
Wildlife habitat development (acres)	105	116
Grazing control (acres)	369	136
Watershed Improvement		
Critical areas planted (acres)	395	28
Forest mangement plans (acres)	5,558	1,904
Proper harvesting practices and marketing assistance (acres)	158	590
Forest Products Utilization Assistance		
Number of Assists	659	1,050
Urban and Community Forestry Assistance		
Number of Assists	724	732
Forest Conservation and Management Agreements		
Number	144	60
Acres	9,663	2,084

Maryland Forest Service			
Fire Danger Class	3	4	5
No. Days FY 77	61	55	12
No. Days FY 78	28	23	9

Maryland Forest Service			
Resource Protection	No. Fires	Acres Burned	Suppression Costs
FY 77	908	5,678	\$29,721.00
FY 78	534	1,162	\$23,585.00

Maryland Forest Service		
I & D Management	Number	Acres
FY 78	72	442,160

Maryland Forest Service		
Roadside Tree Protection	FY 77	FY 78
Number of permits issued		1,465
Roadside trees planted	2,600	2,700
Tree expert licenses issued	260	291

MARYLAND ENVIRONMENTAL SERVICE

Budget	
General Funds	\$ 573,070
Special Funds	1,009,777
Reimbursed Funds (State)	\$ 1,088,021
TOTAL	\$2,670,868
Other Reimbursed Funds	\$11,843,432
Number of Staff	142

The Maryland Environmental Service plans, designs, finances, constructs and operates wastewater treatment plants, water treatment and supply facilities, solid waste disposal systems, and resource recovery facilities.

Presently, MES operates all state-owned water and wastewater treatment facilities such as those in state parks, highway rest areas, schools and hospitals. MES serves as a contract agency for local governments and industries. Utility operations are self supporting from fees and charges received from users.

During FY 78, MES had a combined operating budget of \$14,514,300. This included \$2,670,868 from the general and special fund budgets of the state, plus reimbursed funds from state agencies. Receipts from utility operations charges paid by local governments and private utility customers account for the balance. MES owns four major facilities with a combined capital construction cost of \$18,800,000.

OPERATION AND MAINTENANCE

MES operates water supply and wastewater treatment facilities and provides a full range of user services. The Service has an operating staff of 80 certified operators and supervisors. A quality control section of trained technicians collects samples for analysis in modern, well-equipped laboratories. A backup team of engineers and mechanical specialists provides statewide, 24-hour coverage. MES personnel also handle regulatory agency permits. By the end of FY 78, MES had responsibility for the operations and maintenance of 31 water and 60 wastewater facilities.

DESIGN AND CONSTRUCTION

Significant advances have been made by MES in solid waste management and resource recovery programs. One of the nation's most successful large-scale projects for resource recovery from municipal solid waste is in operation at Cockeysville. During FY 78, this facility was processing an average of 500 tons per day of municipal solid waste. Over 3,600 tons of ferrous materials with a value of \$72,000 were recovered. Another \$1,300 for "white goods" (refrigerators, washing machines, etc.) was salvaged. Additionally, refuse derived fuel (RDF) was prepared for test burning in major industrial installations.

During the year, construction was completed and operations were begun at the Southwest Transfer Station in Baltimore County. This facility is designed to handle 150 tons of refuse per day and allows for efficient transfer from the southwestern part of the county to the Resource Recovery Plant at Cockeysville. A site selection process was initiated for a second transfer station in the Northwest portion of the county. In addition, Baltimore County has authorized MES to conduct a preliminary engineering study of the feasibility of developing an energy conversion facility to utilize the fuel derived from municipal solid waste for the production of electricity.

MES is investigating small scale resource recovery programs for rural areas. MES and Wicomico County are jointly financing and building a Seerdrum facility near Salisbury. This will use technology that is widely used in Europe. When completed in the spring of 1979, it will process 50 tons per day of municipal solid waste, while providing some resource recovery and reducing the need for landfill space. A joint venture between MES and Ocean City has resulted in over 400,000 tires being placed in artificial reefs off the coast. During FY 78, over 150,000 tires were added to the reefs.

In cooperation with USDA Agricultural Research Service, MES continues to conduct its sludge composting research in Beltsville. The success of this program has resulted in a program to compost all sludge produced by Washington's Blue Plains Sewage Treatment Plant. During the year, MES composted 15,000 tons of sludge at the Beltsville site. Another 4,000 tons were processed under contract for MES. 155,000 tons of sludge were entrenched by MES in Montgomery and Prince George's Counties in accordance with the Blue Plains Agreement.

In an effort to develop markets for composted sludge MES representatives have been meeting with several major manufacturers and distributors of

fertilizers and soil conditioners. In addition, over 18,000 small sample bags, representing over 9 tons of compost, were distributed at various conventions and flower, garden and trade shows during the year.

TECHNICAL SERVICES

In the area of technical services and planning functions, MES has responsibility for conducting "Step One" and "Step Two" Studies for state-owned facilities. In addition, MES, under contract, is directing the Central Patuxent Step One study for Prince George's and Anne Arundel Counties; and the City of Bowie and the Twin Beaches Step One Study for Anne Arundel and Calvert Counties.

Considerable work has been done to evaluate the potential for obtaining part of the state's energy needs from solid waste. The "*Energy from Waste*" report prepared and distributed by MES presented a series of cases evaluated by MES. This report received national recognition and over 500 copies were distributed throughout the state and the nation. In addition, MES obtained an EPA grant to conduct test burns to determine if refuse derived fuel can be used in a cement kiln. Under another EPA grant, a study was conducted on the feasibility of extracting methane from landfills in Maryland.

FISHERIES ADMINISTRATION

	Budget
General Funds	\$ 782,572
Special Funds	2,275,737
Federal Funds	<u>428,576</u>
TOTAL	\$3,486,885
Number of Staff	86

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 sport and commercial fishing interests included in tidal and non-tidal environments.

The Administration conducts and supports investigations into finfish and shellfish matters, and maintains extensive statistical and data collections for use in resource management. Finfish hatcheries and stocking and shellfish plantings are part of the Administration's responsibility.

GENERAL DIRECTION

This program includes the overall direction, supervision, and coordination of the activities of the Fisheries Administration. Staff projects including Fisheries Statistics and Finfish Mortality investigations are an integral part of this program, as are personnel and Federal Aid Project Coordination functions.

Fisheries Statistics Project The Fisheries Statistics Project is responsible for the collection and compilation of seafood production data, and has processed approximately 200,000 catch records during Fiscal Year 1978.

Finfish Mortality Project Statewide responsibility for investigating fish kills is shared by the project's two biologists who, in FY 78, conducted fifty-five investigations.

Acute pollution, such as acid spills, etc., was responsible for 25.5 percent of finfish mortalities investigated and kills resulting from chronic degradation accounted for 41.8 percent. Natural causes were responsible for 23.6 percent of the total number of kills.

During the summer of 1977 the State experienced a large number of kills involving young-of-year menhaden. Low dissolved oxygen was responsible for sixteen major kills of menhaden in a twenty-two day period in the western shore tributaries.

The annual springtime die-off of yearling menhaden was of substantial magnitude in 1978. Aerial surveys conducted with the Natural Resources Police pilot indicate that several million fish died during a three week period in late May and early June. Extensive sampling and related field work was carried out by project biologists working with scientists from the National Marine Fisheries Service and the University of Maryland.

A multi-objective study being conducted by the University of Maryland Hospital is funded by the Finfish Mortality Project. Its aims are to develop new methods, and improve old laboratory techniques, used to identify toxic compounds in fish tissue and water, and to assist in the laboratory aspects of the investigation of the annual menhaden mortality. The cost for FY 78 was \$42,330. The work agreement with the Southeastern Cooperative Fish Parasite and Disease Project at Auburn University was continued.

Reparations for fish destroyed in three kills were paid to the Department in the amount of \$7,253.19 during FY 78.

SHELLFISH PROGRAM

The Shellfish Program is comprised of the following projects: Oyster Propagation, Soft Clam, Hard Clam, Surf Clam, Blue Crab, Bay Bottom, and Marine Animal Disease. The total budget appropriation for these projects was \$2,587,023.

Oyster Propagation This was an encouraging year for the oyster industry in the Chesapeake Bay. Spat was the best since the downward trend began in the early 1970's. Prior to this year, 1974 had been the best recruitment year of late, but 1977 exceeded the 1974 levels.

SEAFOOD HARVEST — FY 78

County	Oyster Sept. 1977 - August 1978		Soft Clam July 1977 - June 1978		Finfish July 1977 - June 1978
	Bushels	Value	Bushels	Value	Pounds
Anne Arundel	119,435	\$ 946,320	8,307	\$ 121,720	1,329,663
Baltimore					166,412
Calvert	64,242	521,652	3,030	49,194	891,262
Cecil					387,160
Charles	22,458	183,669			109,242
Caroline					47,822
Dorchester	467,479	2,670,499	42,692	672,483	1,496,237
Harford					151,133
Kent	27,363	204,018	6,829	95,618	1,208,414
Montgomery					24,255
Prince George					127,487
Queen Annes	387,697	2,639,381	62,128	987,525	433,896
St. Marys	169,232	1,311,560	3,470	62,767	126,170
Somerset	429,786	2,905,857	12,085	226,291	112,672
Talbot	512,929	3,314,202	70,575	1,126,759	118,638
Wicomico	89,050	621,970			54,568
Worcester	69	438			
STATEWIDE	2,289,740	\$15,319,566	209,115	\$3,342,356	6,785,031

The influence of the 1974 spat was noted during the 1977-1978 harvesting season, with landings increasing from 1.8 million bushels to 2.2 million bushels. It is expected that more of the 1974 set will be harvested during the 1978-79 season, and that landings will be near the previous season level.

Hard Clam Management Project The Hard Clam Project continued to plant seed clams in an attempt to revitalize the hard clam industry. A total of 1.2 million seed clams were planted at a cost of \$15,000. As in previous years, 70% of the clams went into Chincoteague Bay, and the remaining 30% were divided between Isle of Wight and Assawoman Bays.

The 1978 Maryland General Assembly enacted legislation establishing the coastal area of Worcester County as a separate and distinct management area. As the first step in the preparation of a management plan for this area, members of the Hard Clam Project initiated a series of meetings with local people having interest in the coastal resources. Such meetings provide for the free exchange of opinions and ideas between state resource managers and the local population.

Oyster Propagation

1978 Plantings	Cost	Bushels
Seed	\$275,126	401,785
Fresh Shell	\$165,177	465,345
Dredge Shell	\$879,348	5,309,251

Blue Crab Management Project During FY 78, the Blue Crab Management Project continued its annual population survey seeking to determine the strength of each new year class.

The Blue Crab Management Project's Annual Report was completed in January 1978. This report explains in detail the method and procedures used in sampling crabs; shows the results of sampling in tabular form; and gives the prediction for crab abundance for the following crabbing season. These annual reports are available for review upon request.

At the end of the sampling period in November 1977, sample data indicated a very strong 1976 crab hatch. A large proportion of these crabs reached the five inch legal size limit by that time. Fall sampling gave a preliminary indication that the 1977 crab hatch may also have been a good one. A crab abundance prediction for the following year is based upon number of crabs found during spring, summer and fall sampling of the present year. At that time, it appeared that the 1978 crab harvest would be a good one. As of August 1978, the Maryland crab harvest had not proved to be a good one. It is now believed that the very cold winter and the prolonged cold spell in April and May of 1978 prevented Maryland from realizing the anticipated good harvest of crabs. Many crabs apparently failed to survive the winter and the long, cold spring.

A study conducted during the summer of 1977 to compare shedding mortality rates between groups of red/pink sign peelers and white sign peelers held in commercial shedding tanks was completed in FY 78.

Approximately one hundred written requests, and numerous phone calls from the general public for crabbing information were answered during this fiscal year.

Interstate meetings concerning blue crabs were attended. The National Blue Crab Industry Association Meeting was held in Atlanta, Georgia in November 1977. At this meeting the blue crab situation and outlook for Maryland was presented. A Blue Crab Climatology Workshop was held at Wallops Island, Virginia in January 1978. A Tri-State/Federal Blue Crab-Red Crab Scientific Committee Meeting between Maryland, Virginia, and Delaware was held in March 1978.

The Fisheries Administration adopted two new crabbing regulations for the 1978 season. Calvert Bay, in St. Mary's County was opened to crab potting. A new bank trap and channel pound area was established around Newtown Neck in St. Mary's County. The 1978 Legislature abolished the minimum size limit on mature female crabs and taking of white-sign peeler

crabs and certain green and buckram crabs was legalized.

Soft Shell Clam Management Project Soft-shell clam population surveys on major producing areas revealed market clam densities at the highest level since 1972. However, the 1977 set appears poor and landings will decline in 1979.

A bottom re-survey of charted oyster bars in the Choptank River resulted in 661 acres at Castle Haven and Todd's Point being re-designated as public clamming bottom.

Soft-shell clam regulations were amended to change the dredging hours, require clams to be refrigerated at specific times, and clarify the interpretation of the daily catch limit regulation.

The Fisheries Administration has continued to monitor mortality rates and histological condition of oysters in the upper Chester River.

Surf Clam Project The Fisheries Administration provided for housing and administering this planning project which was funded entirely by the Mid-Atlantic Fishery Council.

The project developed a Surf Clam and Ocean Quahog Fisheries Management Plan which was approved by the U.S. Secretary of Commerce on November 16, 1977. This plan's objective is to rebuild the declining surf clam stocks off the Mid-Atlantic Coast within a 10 year period, minimizing the short term economic dislocation, as much as possible, consistent with the rebuilding of the surf clam stocks. The Management Plan is designed to promote economic efficiency, and prevent overfishing of the ocean quahog stocks. To help achieve these objectives the surf clam yearly harvest was restricted to 35 million pounds of meat and the ocean quahog landings were set at 60 million pounds of meat. In addition, a minimum shell size of surf clams at 4½ inches was set and a moratorium declared on new entries into the surf clam fishery.

Throughout the year as the quarterly harvest approached the predetermined quarterly quota the number of fishing days or hours per week were reduced. When reports indicated 50% of the quota had been harvested, the Regional Director of NMFS took action. The Regional Director also closed specific offshore areas to fishing when more than 60% of the clams were smaller than 4½" and not more than 15% were larger than 5½".

MARINE ANIMAL DISEASE INVESTIGATIONS

During the past fiscal year a total of 2,277 molluscan shellfish were histologically processed. Of these, 1,590 were oysters examined for the pathogen *Dermocystidium marinum*. This disease still persists in areas in the lower Bay, but at suppressed levels. This indicates that the peak of the epizootic has been passed and mortalities should be very low from this disease. Since the pathogen still persists in some areas, the recommendation is made that planting of unexposed oyster stocks be prohibited in these areas. *Minchinia nelsoni* is still found in very low prevalence in a few areas of the lower Maryland portion of the Bay. Oysters in this area are probably resistant to the disease. Such oysters will get the disease but will not usually die from it. It is imperative that such oysters carrying the disease not be transplanted to currently disease-free areas. Likewise, disease-free or unexposed oysters should not be transplanted to the area because of the probability of perpetuating the disease.

A small scale field experiment conducted by the Fisheries Administration is continuing in the Chester River. Oyster trays were placed in the river and filled with oysters from a "clean" area in Eastern Bay. Mortality counts are regularly taken and samples are collected for laboratory examination. Preliminary data reveal that mortalities are nowhere near the levels attained at the time of the "Chester River Mortality" a few years ago. Laboratory examinations reveal that Physiological Stress Syndrome is still seen in the oysters at all times of the year but the intensity of the condition is lower. Further, the oyster shells no longer have the typical appearance associated with the situation — scrubbed/bleached white. Normal periostracum is now appearing and increasing on the shells.

The U.M.C.E.E.S. Horn Pt. Laboratory is continuing a bay-wide *D. marinum* study. About 1,400 oysters have been collected and examined in this study.

In cooperation with the Smithsonian Institution, a program for the Registry of Tumors in Lower Animals has continued since 1974. Special oyster, soft and hard clam samples have been processed for electron microscope examination. Our two groups are also cooperating on a study of shellfish neoplasia in the Bay. To date, out of approximately 30,000 shellfish examined, only 21 neoplasms have been found — 20 in oysters and 1 in a soft shell clam.

The following publications were produced in FY 1978:

1. Otto, S.V., J.C. Harshbarger and S.C. Chang. (In press) *Status of Selected Unicellular Eucaryote Pathogens, and Prevalence and Histopathology of Inclusions Containing Obligate Procaryote Parasites, in Commercial Bivalve Mollusks from Maryland Estuaries*. In: *Haliotis* (a french journal)
2. Harshbarger, J.C., S.V. Otto and S.C. Chang. (In press) *Proliferative Disorders in Crassostrea virginica and Mya arenaria from the Chesapeake Bay and Intranuclear Virus-like Inclusions in Mya arenaria with Germinomas from a Maine Oil Spill Site*. In: *Haliotis*.

BAY BOTTOM SURVEY

Fiscal 78 was the first year that the Bay Bottom Survey was placed under the control of the Fisheries Administration. During this period, only one of the four regions had a survey boat. 22,360 acres were surveyed in the Lower Eastern Shore Region. In an attempt to utilize the personnel in the Central Eastern Shore Region an outboard was outfitted with the necessary equipment and 4,416 acres were surveyed when weather permitted. The total of 26,776 acres were surveyed obtaining data from the hydrophone, Edo and sounding pole. This information will be charted and the results of this work will be used to determine the density of sampling with patent tongs during the next phase of the survey.

TIDEWATER FINFISH PROGRAM

The Tidewater Finfish Program provides information necessary for the management of resident, anadromous and marine finfish.

Resident Species Project This unit monitors annual reproductive and recruitment success of important estuarine fishes for the purpose of management guidance and population assessment. Findings are distributed in data report form to various federal and state agencies charged with natural resource management. These data are also the basis for popular articles on yearly predictions of fish availability to both sport and commercial fisheries.

Unit personnel contribute articles to department publications and prepare reports for public distribution. Included are: *The Status of Striped Bass* and *The Feasibility of Augmenting Maryland Striped Bass Populations Through Hatchery Stocking*.

Anadromous Fish Project This project conducted surveys to determine spawning and nursery streams for anadromous species: striped bass, American shad, hickory shad, alewife and blueback herring. Two estuarine species, white perch and yellow perch, were also included in the surveys. Streams under biological investigation and some additional ones were also surveyed for dams and other problem conditions that affect passage and reproduction of anadromous species.

In the Chester River drainage 24 streams were sampled to document anadromous nursery areas. A total of 51 streams in the study area were surveyed for barriers and other conditions affecting fish propagation. A separate survey was conducted on three streams to determine the presence and population of the American eel and other fish species in freshwater streams.

The data and major information collected by the project are contained in *Survey of Anadromous Fish Spawning Areas*, an annual report for federally aided Project AFC-9-2 and *The Occurrence and Abundance of the American Eel in Freshwater Streams of Maryland*, a final report.

The management information collected was computerized and is used in all phases of environmental review and protection by the Fisheries Administration, consultants, and other Department of Natural Resources agencies.

A motion picture on anadromous species in the Chesapeake Bay area was produced and distributed for use by the general public.

Biological investigations were conducted in the Severn, South, Rhode, and West River drainages to document anadromous spawning streams.

Marine Finfish Project Throughout this fiscal year, 352 coastal sites were sampled and evaluated. This included assessments of the effects of dead-end canals, derelict crab pots, ocean fishing reef construction and a summer flounder creel census. Also included were the continuing trawl and seine sampling programs used to evaluate and predict the status of present and future fishing conditions. The brochure, *The Lure of Natural Bait* was also completed and published with good public acceptance.

TECHNICAL ASSISTANCE

Maintenance and enhancement of the ecosystem and habitats which support aquatic organisms is central to the Fisheries Administration's responsibility for sport and commercial fish populations. The primary means by which the Administration addresses maintenance of fish habitat is that of commenting on and recommending proposals which will potentially affect the ecosystem.

The Fisheries Administration is called upon to review such projects through the Technical Assistance Program. Each project proposal is examined for its implications on water quality, hydrologic changes, non-point source pollutants, and other effects such as cover, consumptive diversions of water, and entrainment of vulnerable organisms.

In FY 78, a total of 1,535 such projects came to the Technical Assistance desk. 165 or about 11% required a detailed, written response. These fell into the following categories: National Pollutants Discharge Elimination System permits; U.S. Corps of Engineers Permit applications (NABOPS) under section 404 of PL 92-500; A-95 Clearinghouse projects; Title 8 of the *Natural Resources Article of Maryland* (surface water appropriations, waterway construction permits, channelizations, etc.); *Maryland Wetlands Law* permits; Miscellaneous, such as statements of Fisheries Policy on various issues; and information requests from consultants preparing environmental impact statements.

In addition to the review and commentary function of the program, the staff is also responsible for developing a management plan for tidal water fisheries pursuant to the needs implied in the *Federal Coastal Zone Management Act of 1972* (PL-92-583.)

The staff is participating in the Water Resources Administration's study of the management needs of the Patuxent River. The interagency dredge *Spoil Disposal Criteria Committee* is attended by the program staff. The staff also represents the agency on the *Steering Committee* for area-wide waste treatment planning (PL 92-500 sec. 208 activities.)

INLAND FISHERIES MANAGEMENT

This management unit is responsible for the cold water and warm water programs.

Coldwater Fisheries Program During Fiscal Year 1978, over 277,000 catchable size trout were stocked into the waters of the state — a 24 percent increase over Fiscal Year 1977. This was perhaps the largest number of such fish to be stocked in any single year. The sources of these fish are shown in the accompanying table:

Source of Trout	Number	(Weight in Pounds)
Albert Powell Hatchery	114,750	(42,000)
Bear Creek Rearing Station	52,274	(24,500)
Federal Hatcheries	110,593	(29,500)
TOTAL	277,617	(96,000)

In addition, approximately 200,000 surplus fingerling trout were stocked into selected waters of the state to provide trout fishing in the future.

The increased number of catchable size trout which were stocked to provide recreational fishing could not have come at a better time since the cost of the Trout Stamp was increased from \$2.50 to \$3.50 on January 1, 1978. A Trout Stamp is now required to fish within any Special Catch-and-Return Trout Fishing Area or to possess trout caught from the non-tidal waters of the state. Prior to January 1, 1978 the stamp was required only to fish within designated trout streams.

Trout Stamp sales for Fiscal Year 1978 increased 3 percent over Fiscal Year 1977; from 34,081 to 35,116. Coupled with the increased fee, this resulted in \$36,000 of additional money for Fiscal Year 1978.

Stream Survey Project Field operations of the Cold Water Fisheries Program remained primarily directed toward the stream survey which is being conducted as a Federal Aid Project (F-26-R). This project will provide the agency with a directory of all natural trout streams in the state, as well as a listing of those which are capable of being utilized for “put-and-take” trout fishing. During Fiscal Year 1978, emphasis was placed upon streams in Garrett, Allegany, Washington, Harford, and Cecil Counties. Streams in other counties were also surveyed to fill in data gaps from previous years of study. Survey personnel estimate that this project will be completed during 1979 and a detailed report of the results will be published in 1980. Interim reports relative to the progress of the study have been prepared annually by program personnel. Federal funding of this project during Fiscal Year 1978 amounted to over \$16,000.

WARMWATER FISHERIES PROGRAM

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 78, Maryland had over 150,000 licensed anglers fishing in over 50,000 surface acres of non-tidal fresh fishable water. Included as part of this figure are 26,196 surface acres of fishable streams and rivers. An estimate of total production of these non-tidal waters has been calculated to be 10.7 million pounds.

At present, Phase I of Joseph Manning Warmwater Fish Hatchery is half completed. The hatchery will be in operation during the fall of 1979.

The Warmwater Fisheries Program participated in the following Federal Aid Studies and Projects:

1. Potomac River Study — 3rd year completed
2. Warmwater Fisheries Investigations
 - a. Channel catfish life history — Upper Bay 3rd year
 - b. Largemouth bass life history — Upper Bay 2nd year
3. Susquehanna River Smallmouth bass study 1st year
4. Warmwater Fisheries Development was responsible for the reprinting and distribution of 10,000 free fishing maps

Approximately fifty-five lakes and ponds were checked by program personnel. Seven reservoirs were studied and had good Black Bass spawning success.

The third year of Potomac River Investigation encompassed eighteen sampling stations for water quality data and benthic macroinvertebrate collection. Water quality was very poor in that portion of North Branch Potomac River above Cumberland.

Plans and design for a visitor center at the Joseph H. Manning Fish Hatchery were completed with an anticipated construction date of the spring 1979.

Fish Stocking FY '78

AGE	SPECIES	NUMBER
Advanced Fingerling	Largemouth bass	5,000
Fingerling	Largemouth bass	60,000
Fingerling	Bluegill sunfish	325,000
Fingerling	Channel catfish	14,000
Adult	Channel catfish	25,000
Fry	Walleye	1,000,000
Fry	Tiger Muskellunge	10,000

WILDLIFE ADMINISTRATION

	Budget
General Funds	\$ 52,379
Special Funds	1,280,047
Federal Funds	<u>736,546</u>
TOTAL	\$2,068,972
Number of Staff	92

The wildlife resources of Maryland are widely used by citizens who spend millions of dollars each year in pursuit of wildlife related recreation. Approximately 200,000 sportsmen pursue game animals and thousands more enjoy the aesthetic values of wildlife.

The Wildlife Administration's goal is "the enhancement of wildlife populations to meet the demand of wildlife oriented recreation and to ensure the continued survival of wildlife in the state".

Maryland's wildlife management and research efforts are financed almost entirely by hunters; thus the major emphasis of wildlife management is directed toward game animals. However, all wildlife species are considered in management decisions with the result that nongame animals benefit from game management practices.

Responsibilities of the Wildlife Administration include regulating seasons, bag limits, and methods of taking game animals, assisting other state agencies and private landowners in land management and wildlife planning, issuing permits and licenses for activities that directly affect wildlife, providing technical assistance for nuisance wildlife control, and managing areas for public wildlife enjoyment, including hunting, trapping, field trials, nature study and photography.

The seven agency programs comprising the Wildlife Administration are Land Management and Technical Services, Forest Wildlife, Furbearer and Marine Mammals, Waterfowl, Nongame and Endangered Species, Upland Wildlife, and Environmental Services. During FY 78 each program monitored distribution abundance and the habitat changes affecting their

respective wildlife species. Information was presented to the public through correspondence, reports, news releases, and public meetings.

Agency personnel in cooperation with the International Association of Fish and Wildlife Agencies compiled, edited and published the first major reference text on the management, research and harvest status of North American furbearers.

The agency was one of the sponsors of the formation of the Worldwide Furbearer Conference, Inc. The purpose of the organization is to hold the first major conference concerning the biology and management of furbearers of the world in Frostburg, Maryland on August 3-10, 1980. The other sponsors are the University of Maryland, Center for Environmental and Estuarine Studies and the International Association of Fish and Wildlife Agencies.

Arrangements were made for the International Association of Fish and Wildlife Agencies 68th Annual Convention in Maryland on September 10-13, 1978.

A muzzleloader season for deer hunting was established for the first time for the 1978-79 hunting season.

A new law was passed reclassifying fisher, red and gray fox, skunk and long-tailed weasel as game animals, affording these species management protection where none had previously existed.

LAND MANAGEMENT AND TECHNICAL SERVICES PROGRAM

This program includes dissemination of information regarding policy and regulations concerning wildlife, technical assistance and wildlife management plans.

During FY 78 licenses and permits were issued to over 1,000 persons who dealt in some way with wildlife, exclusive of hunting and trapping, and district personnel provided over 1,000 persons with technical assistance and environmental reviews.

Additional land acquisitions in FY 78 amounted to 1,691 acres, making the total acreage of State Wildlife Management Areas 75,177.

FOREST WILDLIFE PROGRAM

This program is responsible for management of the wild turkey, white-tailed deer, sika deer, ruffed grouse, gray squirrel, eastern fox squirrel and red (piney) squirrel species. These wildlife species currently provide over one million hunter days of recreation afield.

Ongoing investigations were conducted to determine mortality rates for the white-tailed deer and gray

squirrel. Also, the second year of a five-year life history study on the sika deer was conducted. This provided useful data on the home range and habitat preferences. Population trend surveys on deer, grouse, squirrels, and turkeys were conducted.

FURBEARER & MARINE MAMMAL PROGRAM

This program was primarily responsible for the management of eighteen species of furbearers in Maryland. The 1977-78 annual furbearer harvest generated over \$3,000,000 of new money to Maryland's fur harvesters. A Marsh Ecology and Furbearer Management Program was conducted at the Cambridge High School and various public and private projects involving furbearer habitats were reviewed.

The program staff negotiated four extensive research projects on raccoon, bobcat, gray fox and nutria through contracts with the Appalachian Environmental Laboratory. Members of the program staff wrote 5 technical papers, 2 monographs and one book on furbearers.

WATERFOWL PROGRAM

The wetland wildlife species considered in the Migratory Waterfowl Program include eight species of dabbling ducks, eleven species of diving ducks, five species of seaducks, 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.

January 1978 waterfowl surveys indicated that total waterfowl — 753,900 — in Maryland decreased slightly in comparison to the January 1977 estimate of 776,000. Decreases were noted primarily among mallards, black ducks, snow geese and Canada geese. Extensive ice coverage caused by prolonged freezing again reduced some feeding areas.

Surveys of the changes and conditions of waterfowl habitat indicated a slight decrease in bay grasses from the last fiscal year. Experimental transplanting of submerged seagrasses was started to determine the limiting factors. Evaluation of pen-reared mallard releases was continued. An education program on steel shot regulation for waterfowl hunters was also continued.

NONGAME AND ENDANGERED SPECIES PROGRAM

This Program includes species of wildlife not legally classified as game birds or mammals and those species threatened or endangered. These include thirty-seven species of amphibians, forty-six species of reptiles, two

hundred eighty species of birds, and fifty-one species of mammals.

The coordination of research responsibilities includes program planning and issuing endangered species, bird banding, and scientific collection permits. The Endangered Species Program of the Maryland Wildlife Administration is continuing several studies initiated over the past years. A cooperative agreement for the conservation of endangered species was signed with the U.S. Fish and Wildlife Service in 1976 making the state eligible for matching funds.

Several raptors were rehabilitated and released into the wild through the cooperation of licensed veterinarians.

UPLAND WILDLIFE PROGRAM

The Upland Wildlife Program is responsible for the management of rabbits, quail, pheasants, doves, woodcock, and crows and the recreational use of these species in Maryland.

Research studies were conducted on the nesting success of mourning doves in Maryland and the hunting mortality rates on quail and rabbits on selected wildlife management areas. Trend surveys were continued on all upland species.

A hunter-use survey of licensed hunters in Maryland was completed to obtain estimates of numbers of hunters, efforts expended, and harvest for selected game species.

An "Acres for Wildlife" program was initiated to: 1) protect, improve, or create upland wildlife habitats on private lands and rights-of-way, and, 2) create an awareness of what upland wildlife habitat actually is and the need for management.

ENVIRONMENTAL SERVICES

This program conducts the environmental review and assessment of federal, state and local projects as they affect the wildlife resources of the state.

The Environmental Review project has concentrated on better coordination and review of wetland projects, roads and bridges, and SCS PL 566 drainage projects.

The Resources Planning project has completed the production of base maps (600 scale) for all the wildlife management areas, to be used in preparing wildlife management area plans for each district. In FY 78 18 wildlife management areas have a completed five year plan.

The Special Planning project has completed wildlife management plans on 5 major non-public areas in order to increase wildlife benefits.

ENERGY AND COASTAL ZONE ADMINISTRATION

	Budget
General Funds	\$ 438,385
Special Funds	5,552,677
Federal Funds	<u>1,569,703</u>
TOTAL	\$7,560,765
Number of Staff	47

The Energy and Coastal Zone Administration's mission is to evaluate the production and conservation of energy while keeping adverse environmental and fiscal effects to a minimum. Preservation, protection and restoration of the coastal zone are integral parts of the Administration's responsibility, as is the management of the state's principal energy resource, coal. The Administration offers assistance to Marylanders in need of fuel for industry and domestic use.

The four operating programs within the Administration are Power Plant Siting, Bureau of Mines, the Coastal Zone Program and the Energy Policy Office. All four accomplish their tasks mainly through special and federal monies.

Power Plant Siting

The Power Plant Siting Program provides for strict enforcement of environmental controls but also imposes responsibility on the Program to help utilities to meet those standards. The law provides for:

a. Consolidated decisions that incorporate inputs from all of the various economic, environment, health, and planning agencies into a single action of the Public Service Commission;

b. Use of the authorities of state government to evaluate proposed power plant sites, conduct research, monitor individual and cumulative effects, and to purchase and hold power plant sites for future electric utility use;

c. A dependable fund source for the program by placing a small environmental charge on electricity produced within the state (currently 0.15 mills/Kwhr).

Activities are organized in four functional areas: Specifically:

a. The Impact Assessment Program monitors, assesses and models the environmental impact of existing power plants.

b. The Site Evaluation Program calculates the impact of future power plants at proposed sites. These calculations are presented for consideration at the Public Service Commission's hearings on Certificates of Public Convenience and Necessity. The program also conducts a detailed site investigation, including extensive field data collection, of all proposed power plant sites.

c. The Research Program is geared to developing an understanding of Maryland's environmental resources, and socioeconomic structure. This understanding is necessary to site and operate power plants with a maximum benefit to society and minimum detriment to the ecosystem.

d. The purpose of the Site Acquisition Program is to identify, investigate, acquire, and hold in the Site Bank, an inventory of sites suitable for the construction and operation of power plants.

	FY 77	FY 78
Power Plant Siting		
Sites Evaluated	4	4
Impact Assessments Underway	4	4
Sites Acquired or Proposed for Acquisitions	2	2
Research Projects	15	17
Reports Issued	5	10

BUREAU OF MINES

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 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 Recent legislation makes possible the restoration of abandoned mines which for decades have presented serious environmental problems. Money collected from a surcharge on mined coal is used to repair the environmental damage caused by abandoned mines. In addition, abandoned mines are reclaimed in conjunction with the active Mining Program.

Bureau of Mines

Actives Mines		
Number of Active Mines	115	103
Tons Mined	2,719,444	2,806,290
Number of Mining Plans		
Reviewed	86	78
Acres Permitted	1,978	3,466
Acres Reclaimed	479	888
Abandoned Mines		
Projects Started	5	5
Number of Acres Reclaimed	47.5	35.2

COASTAL ZONE MANAGEMENT PROGRAM

In FY 78, the Unit completed the final draft of its implementation plan. The program addresses coastal problems and issues related to the fragility of the state's two ecosystems: the marsh/estuarine system of the Chesapeake Bay and its tributaries, and the narrow and exposed beaches and barrier islands of the Atlantic coast. The document represents the state's proposal to carry out a coordinated and comprehensive system for managing coastal resources in these areas.

Although existing state authorities will be used to implement and enforce the Maryland CZM program, several new and very important changes will occur in the way coastal resources are managed in the state. The most significant changes include:

1. **New and Specific State Coastal Management Policies.** These explicit policies provide predictability in state resource decision making not realized before. People proposing to undertake projects in the coastal zone will have a clearer understanding of the state's position regarding their project. The policies also provide the framework for cooperative action among governmental agencies to address coastal problems and resolve coastal policy questions.

2. **Coastal Zone Management as official state policy.** As a result of an executive order signed by the Governor, the Coastal Zone Management Program constitutes official policy for coastal resources and therefore state agencies must comply with these policies.

3. **Program Review Process.** The Coastal Zone Management Program has created a new process for reviewing all existing coastal programs and procedures for example, current rules and regulations, local planning and zoning efforts, etc., in order to determine their consistency with the state's coastal management program.

4. **Project Evaluation Process.** The program establishes a new procedure to insure that all major projects proposed for the coastal zone are comprehensively reviewed and evaluated.

Coastal Resources Advisory Committee

CRAC occupies an important position in providing guidance on best uses, conservation, and preservation of the state's coastal area resources under the CZM program. Reorganized within the past year, individuals representing local governments, umbrella groups, and important interests in the state now constitute the voting membership for the committee. Individuals representing state and federal agencies and academic institutions provide technical support on a non-voting basis.

Studies were carried out during the year to provide the program with needed technical data for use in evaluation of the proposed activities in the coastal zone.

ENERGY POLICY OFFICE

During the year, the Energy Policy Office began full scale implementation of the State Energy Conservation Plan, funded under the *National Energy Policy and Conservation Act*. A State Energy Conservation Board was formed to assist in this effort.

The Office was instrumental in obtaining legislation providing energy conservation guidelines for new construction throughout the state and has sponsored a variety of training programs aimed at energy consumers in the residential, commercial, industrial, transportation and government areas. Eighty-five thousand seven hundred pieces of conservation literature were distributed during the year, 5,686 phone calls were serviced on the energy hot-line, over 2,000 persons attended extension service energy seminars on energy conservation, 10,000 copies of a Maryland Energy Conservation Guide for Agriculture were distributed and requests for this book have come from all over the nation. An additional 10,000 energy conservation guides for commercial and recreational boating, religious institutions, and multi-family dwellings were mailed.

MARYLAND GEOLOGICAL SURVEY

	Budget
General Funds	\$ 892,559
Special Funds	274,728
Federal Funds	—
TOTAL	\$1,167,287
 Number of Staff	 24

The mission of Maryland Geological Survey is to: conduct topographic, geologic, hydrologic, and geophysical surveys, and to prepare topographic, geologic, and other types of maps to meet specific needs. The Survey prepares reports on the extent and character of the geology, mineral, and water resources of the state, and supervises provisions relating to archeology. Maryland Geological Survey engages in, sponsors, and coordinates archeological research in the state; encourages preservation of archeological resources, and disseminates information about the archeology of Maryland.

Through scientific investigation and analysis, the Survey seeks to obtain a better understanding of the geology, archeology, water resources, and mineral resources of the state; and to apply this knowledge to practical problems related to the earth sciences. Examples of such applications include water supply, water pollution, assuring continuing supply of mineral resources, the many ramifications of land use, the use of the Chesapeake Bay and Bay bottom, shore erosion and shore protection, and the preservation and study of archeological sites threatened by development.

Survey expenditures increased from \$927,214 in FY 77 to \$1,167,287 in FY 78. The increase resulted from an additional \$125,514 in Special Funds and \$116,224 in General Funds.

PUBLICATIONS

New publications available for distribution in FY 78 include: *Reisterstown Quadrangle Geologic Map* by William P. Crowley; *Middle River Quadrangle Geologic Map* by J. Reinhardt; *Catoctin Furnace and Blue Ridge Summit Quadrangle Geologic Map* by J. Fauth; *Quadrangle Atlas No. 5, Jarrettsville Quadrangle Hydrogeology*, by L. J. Nutter*; *Quadrangle Atlas No. 6, Bel Air Quadrangle Hydrogeology* by L. J. Nutter*, revision of the *Talbot County Topographic Map*, revision of the *Washington County Topographic Map*; revision of the *Cecil County Topographic Map*; *Basic Data Report No. 9, Interstitial Water Chemistry of Chesapeake Bay Sediments* by O. P. Bricker; *Information Circular No. 25, Mineral Industry of Maryland in 1975* by J. A. Sutton; *Bulletin No. 32, Ground Water Resources in Harford County* by L. J. Nutter*, *Open File Report, Geologic and Hydrologic Data From Two Core Holes Drilled Through the Aquia Formation (Eocene-Paleocene) in Prince George's and Queen Anne's Counties, Maryland* by H. J. Hansen; *Report of the Chesapeake Bay Earth Science Study; Geology, Science/Profession*, a booklet printed in cooperation with the American Geological Institute.

Topographic maps are the most popular publications, with the order of sales for FY 78:

Map	Sales
Talbot County	867
Garrett County	817
Queen Anne's County	610
Washington County	562
Carroll County	515

*in cooperation with the U.S. Geological Survey, Water Resources Division

COMMITTEE ACTIVITIES

Through its Director, the Survey is involved with a number of intra-state and state-federal advisory activities. These functions include the *Mid-Atlantic Governors' Coastal Resources Council*; the *Outer Continental Shelf Environmental Studies Advisory Committee*; and the *Interstate Mining Compact Commission*. The Survey Director represented the Governor as Chairman of the *Interstate Mining Compact Commission* during calendar 1977.

Thirty-five speeches, illustrated lectures and field trips were conducted.

Maryland-Delaware Boundary Survey For a number of years, the Maryland Geological Survey has been a co-sponsor, along with the Delaware Geological Survey and the National Geodetic Survey Section of the National Oceanographic and Atmospheric Administration, of a resurvey of the Maryland-Delaware boundaries. The final portion of the boundary lines were resurveyed in 1978 and a ceremony to commemorate its completion was held on June 26, 1978, on the boundary near Denton, Maryland, where a special commemorative bronze plaque in a marking stone had been placed.

HYDROGEOLOGY AND HYDROLOGY

The Hydrogeology and Hydrology Program, in cooperation with the U.S. Geological Survey, is responsible for the maintenance of a statewide water data network and the investigation of the hydrologic and geologic characteristics of Maryland water resources. The water data network provides necessary information on 1) minimum, maximum, and average stream flows for the planning of water supply and sewage facilities, water power projects, dams, bridges, and other public and private works; 2) the amount of sediment load in the Potomac River Basin; 3) the ground-water levels in selected wells throughout the state to determine the hydrologic effect of long-term changes in pumpage, land-use patterns, and precipitation; and 4) the chemical quality of streams at selected localities.

Site-specific water-resources projects are undertaken to extend the inventory of water resources of the state and to determine water characteristics and rates of replenishment. During FY 78, investigations were underway in areas of Anne Arundel, Baltimore, Calvert, Caroline, Carroll, Cecil, Dorchester, Garrett, Howard, Kent, Montgomery, St. Mary's, and Washington Counties.

Stream-Flow Gaging Network 84 continuous-record stream-gaging stations were in operation. In addition, 15 crest-stage, partial-record stations were operated. Data from these stations for the 1977 water year were compiled and published in *Water Resources Data for Maryland and Delaware*, U.S. Geological Survey Water-Data Report MD-DE-77-1.

Water Quality and Sediment Network Surface water samples were collected monthly for chemical analysis at four network stations and quarterly at nine other stations. Regular sampling at four suspended-sediment stations was continued in the Potomac River Basin.

Ground-Water Data Network 101 wells and springs comprise the regular network, and several hundred wells are being measured periodically as part of aquifer research projects.

Low-Flow Analyses Discharge measurements were made at all of the low-flow sites. A total of 86 sites have been established.

Garrett County Water Resources Data Inventory More than 1,400 wells are inventoried, key-punched, and edited. A list of principal groundwater users was compiled and pumpage records reviewed.

Small Basin Modeling Stream flow and bi-weekly ground-water level measurements continued in three small basins: 1) South branch Casselman River near Bittering, Garrett County; 2) Tributary to Cattail Creek near Cooksville, Howard County; and 3) Marsh Run near Grimes, Washington County. Two additional observation wells were drilled in Marsh Run basin and one in Casselman Basin.

Geohydrology of Carroll County Geohydrology Atlases of the New Windsor, Westminster, and Winfield Quadrangles have been approved for open-file release. The Carroll County portions of the Hampstead and Lineboro Atlases were finished and are now being combined with the Baltimore County maps prior to release. The Finksburg Quadrangle was finished in FY 78 and is currently in review. At year's end basic ground-water data were being compiled in the Littlestown, Manchester, Sykesville, Taneytown and Union Bridge Quadrangles. A 340 deep test/observation well yielding 40 gallons per minute was completed near Greenmount.

Geohydrology of Baltimore County Atlases were prepared for the Hampstead, Lineboro, and Reisters-town Quadrangles. Field data collection was started in the Ellicott City, Hereford, and New Freedom Quadrangles.

Geohydrology of the Poolesville Area of Montgomery County Data collection proceeded with the construction of a stream-gaging station on Broad Run in the western part of the project area. In addition an observation well network of 31 wells was established. 250 wells have been inventoried in the project area of which approximately 25 were sampled for chemical analyses.

Piney Point Aquifer Project This project ended in FY 78 with a report submitted for review.

Potomac Aquifer Project-Upper Eastern Shore In addition to drilling activities, in conjunction with the Coastal Plain aquifer research project, preliminary maps were prepared. Two computer programs were revised to fit the specific needs of the project.

Coastal Plain Aquifer Research During FY 78 emphasis was placed on the Potomac Group aquifers. Deep exploratory test wells were completed in Kent County and at Fairlee and in Anne Arundel County. Work was continuing at Massey in Kent County.

Hydrogeologic Aspects of Power Plant Siting Funds budgeted for this project were used to support continued monitoring of observation well stations at Douglas Point in Charles County, Chalk Point in Prince George's County, and Elms site in St. Mary's County, as well as the establishment of new sites at Codjus Cover and Fairlee.

Manokin-Ocean City Aquifer System A report summarizing the results of this project was submitted for review in FY 78. A digital model of the fresh-water aquifer system was used to simulate future pumpage conditions.

ENVIRONMENTAL GEOLOGY AND MINERAL RESOURCES

This program has the responsibility for geologic and environmental mapping and research, topographic map revision, mineral and energy resource investigations, and dissemination of geologic information. Such studies provide the basic framework for delineating and managing the State's mineral and land resources, and thus generate the geologic data necessary for prudent land use decisions. A relatively new approach in environmental mapping is the Mineral Resource and Mined Land Inventory Maps and maps showing the Geologic Factors Affecting Land Modification.

Expenditures in FY 78 were \$184,125, in contrast to \$139,073 in FY 77. The following investigations were in progress or completed in FY 78:

Geologic and Environmental Mapping Geologic mapping continued in the Finksburg and Phoenix 7.5 minute quadrangles. Mapping was initiated in the Upper Marlboro, Woodsboro, and Urbana quadrangles. A revised geologic map of Washington County was completed and sent to the printer.

Topographic Mapping A limited revision of the Talbot County map was completed during the year. Both the Baltimore and Frederick County maps were reprinted.

Mineral Resources A study was initiated in cooperation with the Coastal Zone Unit to outline areas in the Baltimore region with potential for future exploitation of sand and gravel. A limestone sampling and testing project was undertaken in cooperation with the U.S. Bureau of Mines.

The Prince George's County Mineral Resources and Mined Land Inventory Map was completed in FY 78 and is slated for publication. Updating of the White Marsh Quadrangle Mineral Resource and Mined Land Inventory began and is set for publication in FY 79. The Directory of Mineral Producers was revised and is to be published in FY 79.

The advent of offshore Atlantic continental shelf leasing in August 1976 and drilling in March 1978 prompted the Survey to add a petroleum geologist to the staff. Numerous meetings with federal agencies, with counterparts in adjacent states, as well as with agencies within the state are all part of this project.

A Federally-funded geothermal drilling program has been initiated in the state as part of an overall Atlantic Coastal Plain program. Plans are to drill five wells on the Eastern Shore during FY 79. This program will continue throughout FY 79, with the possibility that additional wells will be drilled in the search for anomalous warm water zones.

Publication of a guide to Maryland fossil collecting should be accomplished in FY 79. Coal-related projects are continuing in Garrett and Allegany Counties, including coal seam sampling and mapping of selected quadrangles within the coal basins. A report detailing coal quality and composition is planned for FY 79.

COASTAL AND ESTUARINE GEOLOGY

The Coastal and Estuarine Geology Division has the responsibility for basic and applied geological investigations in the coastal zone of Maryland. The overall objectives are to determine the process altering the shoreline areas of Maryland and to characterize the physical and chemical aspects of the recent sediments of Chesapeake Bay. The program has two major projects: Applied Research Investigations and the Chesapeake Bay Earth Science Study.

Applied Research Investigations The major activities involve monitoring shoreline changes along Chesapeake Bay and along the Atlantic Ocean. Measurements are conducted at 100 sites along Chesapeake Bay and 25 sites along the Atlantic Ocean shoreline.

The winter developed into one of the worst storms ever recorded along the Atlantic Ocean. The first "northeaster" of the season (October 14-17, 1977) accounted for over 500,000 cubic yards of erosion at Ocean City, Maryland and was the worst since the March, 1962 storm.

Chesapeake Bay Earth Science Study The Chesapeake Bay Earth Science Study encompassed the bulk of the program's time, funds and personnel. The study (CBESS) objectives are to investigate the physical, chemical, and biological characteristics of the bottom sediments of Chesapeake Bay. To accomplish these objectives, CBESS has three major task areas: Sedimentology, Geochemistry and Benthic Biology.

Sedimentology

The objective of this study is to determine the distribution and physical properties of the Chesapeake Bay sediments and to identify the sites of erosion or deposition of these sediments in the estuary.

To date, 40% of the sampling locations have been sampled, from the Bay Bridge south to the mouth of the Choptank River. A basic data report is in preparation. A second report was in the final stages of preparation: *Pattern and Volume of Erosion and Deposition in the Annapolis-Kent Island Area of Chesapeake Bay*.

Geochemistry

The objectives of this investigation are: 1) to characterize the composition and to examine the variations in interstitial water chemistry as a function of sediment type and position along the salinity gradients of the Bay; 2) to interpret the reactions between the mineral components of the sediments and the interstitial waters which may control the concentration of dissolved species in the system; and 3) to determine the mechanisms and assess the extent of transfer of chemical species across the sediment-water interface.

The CBESS staff assisted the U.S. Geological Survey investigation of the interstitial water chemistry of the Potomac River.

A special report entitled, *Carbon and Sulfur Content of the Annapolis-Kent Island Area* was in final preparation.

Animal-Sediment Interrelationship

The objective of this investigation is to describe and elucidate animal-sediment relationships of the Maryland portion of the Chesapeake Bay estuary.

The information gathered will be presented in a map or graphical format indicating the biogenic and physical sedimentary structures and geochemical profiles that are relevant to the existing biota.

DIVISION OF ARCHEOLOGY

The archeology program is responsible for researching Maryland archeology, for coordinating professional and amateur archeological activities in the state, and for administering the permit system for archeological investigations on state lands, as provided in the *Maryland Archeological Resources Act of 1968*. The division maintains a reference library, archives, and collections on Maryland archeology. Its resources are made available to the public, government agencies, and professional colleagues through publications, lectures, and open files.

Highway Impact Studies involve archeological document review and field reconnaissance of proposed highway rights-of-way. This is a continuing project funded by the State Highway Administration. During FY 78, studies and reports were completed for 31 highway projects in 12 counties.

Department of Natural Resources Project Assessments investigate areas of potential archeological significance where construction is planned by DNR and provide components for management and master plans being developed for state parks and natural resources management areas. During FY 78, archeological studies and reports were completed for 24 projects in 11 counties.

The Monocacy Region Study is designed to provide basic research and management information on archeological sites, artifacts, and chronology of the Monocacy River area in Frederick and Carroll counties. The project involves review of available files and collections (public and private), systematic sampling surveys in the field, and test excavation of selected sites. Funding is provided by a Heritage Conservation and Recreation Service grant; a significant portion of the division's match is provided by the services of volunteers.

Other division activities include: completion of a study of aboriginal soapstone quarries; salvage of endangered sites on private lands; assisting the Department of State Planning to develop a computerized inventory of archeological sites; representing DNR in connection with a new cave protection law passed by the General Assembly; working with a citizen group urging new legislation to protect underwater archeological resources; and commenting on numerous projects and reports submitted by private and government organizations for review by the State Archeologist. The division monitored major archeological investigations at Fort Frederick State Park and at Catoctin Furnace in Cunningham Falls State Park.

MARYLAND ENVIRONMENTAL TRUST

	Budget
General Funds	\$59,515
Special Funds	—
Federal Funds	—
TOTAL	<u>\$59,515</u>
Number of Staff	3

The Maryland Environmental Trust was created to conserve, improve, and perpetuate the natural, scenic, and cultural qualities of the Maryland environment. Its policies and programs are defined and supervised by a volunteer board of trustees consisting of twelve citizens and three *ex-officio* members. As in recent years, M.E.T.'s major activities are the acquisition of conservation easements, local community improvements, and conservation.

The Trust's main activity is to encourage landowners of rare or unique natural areas, productive farmland, large open spaces, waterfront, or scenic areas to donate conservation easements on their land to preclude development of their property. The Trust through its *Keep Maryland Beautiful* activity works with local organizations to establish programs to conserve energy and materials, improve local environments, and increase citizen-awareness of the need for voluntary stewardship of Maryland's natural resources.

These primary programs were conducted by the Trust's three permanent and one temporary employees. They were aided by a total of 164 volunteers who contributed 12,310 hours to the Trust's work. The Board of Trustees donated 500 hours to administrative and policy meetings, testimony, research and public events. M.E.T.'s seven county committees had 146 members who invested 11,270 hours in programs such as environmental forums, workshops and hearings, *Save Our Streams* projects, task forces on solid waste, surface mining, and used oil recycling, park and port planning, and barrier islands.

The Environmental Trust was given three easements on 424.8 acres in Montgomery and Harford Counties. Three other easements affecting 1,557.35 acres in Howard County and Montgomery County were completed but not ratified and recorded in this fiscal year. In addition, the Trust has three easements in progress which will protect 909 acres of farmland in St. Mary's, Harford and Frederick Counties. Fifteen other properties in eight counties were investigated for possible conservation easements.

Trust easement work in Montgomery County was notably successful in the Sugarloaf Mountain area where two completed and pending easements on 1,412 acres supplement other land preservation efforts by state, county and private agencies.

The Environmental Trust is now responsible for twenty-five easements in fourteen counties and Baltimore City which restrict use of 6,149 acres. In FY 1977 the Environmental Trust held conservation easements on 5,305 acres. This is a 16% increase in one year.

During this period the Trust began its second solicitation of land owners in the Chesapeake Bay region. In 1977 the Trust had contacted 4,500 owners of natural areas on the Bay; this new solicitation is based on a priority list of natural areas according to their ecological importance or rarity and a priority list of the areas' vulnerability to destruction or degradation. Preparation included consultation with all state, local and federal agencies with land acquisition programs in Maryland so that the Trust's easement program will complement other land preservation programs. This second campaign will begin in FY 1979 with a series of local public information programs to acquaint landowners and residents with the conservation values of these areas.

Keep Maryland Beautiful is M.E.T.'s oldest activity. In 1978, *Keep Maryland Beautiful* distributed 35,800 promotional items such as litter baskets and bags to state agencies, civic groups, and individuals.

Keep Maryland Beautiful also arranged with the Coastal Zone Management Unit of the Department of Natural Resources to take responsibility for organizing the public presentation of a film on estuarine resources, problems, and solutions in at least 29 places in Maryland. The Trust is collaborating with more than 100 local conservation, educational and civic organizations to sponsor the presentations.

Maryland Environmental Trust has seven volunteer committees in Allegany, Baltimore, Howard, Montgomery, Somerset, Wicomico, and Worcester Counties and is forming affiliates in Charles, Kent, and Frederick Counties. The Trust also worked on mutual projects with other organizations, such as *Kent Conservation, Inc.*, the *Committee To Preserve Assateague Island*, the *Maryland Historical Trust*, the *Maryland Conservation Council*, *Manhattan Beach Community Clean Up Jamboree*, the *Federated Garden Clubs of Maryland*, and the *Baltimore Environmental Center*. The projects concerned such matters as environmental education, community improvement, farmland preservation, used oil recycling, the A.I.S.L.E. energy conference, and local zoning cases.

The Trust's *Keep Maryland Beautiful* activity also printed and distributed 5,000 copies of its full-color Earth Satellite poster "Our Shores Survived The Winter of '77. . . Can They Survive Us?"

Through volunteers the Trust helped to publish: *A Directory for Recycling Solid Waste in Maryland*, *How To Report Pollution in Maryland*, *Directory of Conservation Organizations in Maryland*, and a poster listing collection centers for used oil.

NATURAL RESOURCES POLICE FORCE ACTIVITIES

	FY 77	FY 78	Change
Headquarters Section			
Calls received	22,363	20,730	- 7%
Public relations details	414	157	- 62%
Police Academy (Staff Hours)			
Cadet training	15,574	12,179	- 21%
Recruit training	9,594	6,468	- 32%
Inservice training	639	3,983	+623%
Maintenance and Supply Section			
Store requisitions	2,018	1,775	- 12%
Repair job orders	1,125	1,117	- 1%
Aviation Section			
Hours flown	169	97	- 43%
Cases made	62	48	- 23%
Inland Division			
Field Enforcement Section			
Arrests	2,088	2,003	- 4%
Warnings	372	377	+ 1%
Telephone calls received— office	32,583	39,192	+ 20%
Telephone calls received— home	19,403	20,692	+ 6%
Investigations Section			
Investigations	115	121	+ 5%
Warrants served	117	101	- 14%
Hunter Safety Program			
Students certified	8,285	15,511	+ 87%
Volunteer instructors	573	708	+ 23%
Accidents	46	40	- 13%
Marine Division			
Enforcement			
Arrests	2,677	3,114	+ 16%
Warnings	3,122	2,841	- 9%
Assists	2,252	2,012	- 10%
Inspections	123,389	123,404	
Boating accidents	210	222	+ 1%
Boats involved	303	303	
Stolen boats	240	218	- 9%
Recovered boats	174	127	- 27%
Stolen motors	156	92	- 41%
Recovered motors	60	25	- 57%

NATURAL RESOURCES POLICE FORCE

	Budget
General Funds	\$2,897,511
Special Funds	1,421,613
Federal Funds	283,873
	<hr/>
TOTAL	\$4,602,997
Number of Staff	237

The Natural Resources Police Force is responsible for enforcement of all laws and regulations promulgated to protect the natural resources of Maryland and for the enforcement of the *State Boat Act* on both tidal and non-tidal waters.

GENERAL DIRECTION

The **Headquarters** Section plans and provides administrative support and services for the operational divisions, and includes a communications division. The Headquarters Section has a staff of fifteen uniformed and clerical personnel (6% of the total force) with a budget of \$238,563 (5% of the agency budget).

The **Police Academy** provides basic training for cadets and recruits and advanced training for field personnel. This section also provides various support activities to the operational divisions. With a staff of two uniformed officers (1% of the total force) and an operating budget of \$44,984 (1% of the agency budget), the activities of the Police Academy were carried out as shown in the accompanying table.

The **Maintenance and Supply** Section provides maintenance and repair service to the Natural Resources Police patrol boat fleet and associated equipment. The facility also serves as a centralized supply depot responsive to the police force as well as sister agencies.

This section has a work force of 11 men (5% of the total force) and a budget of \$194,772 (4% of the agency budget).

The **Aviation** Section provides aerial services for the Natural Resources Police and other agencies. With a staff of two officers (1% of the total force) and a budget of \$39,742 (1% of the agency budget), services were performed as shown in the accompanying table.

INLAND ENFORCEMENT

The **Field Enforcement** Section is responsible for the enforcement of those laws pertaining to the protection of all wildlife species. In addition, it enforces the *State Boat Act* on the non-tidal waters of the state, and investigates criminal activities uncovered during the performance of its primary mission. There are sixty-nine employees (29% of the total force) with a budget of \$1,388,902 (32% of the agency budget).

The **Hunter Safety** Program provides classroom training and lectures on a statewide basis, to promote safe hunting practices and outdoor recreation. Operating expenses for a staff of six (2% of the total force) amounted to \$155,404 (3% of the agency budget).

MARINE ENFORCEMENT DIVISION

This division is responsible for the enforcement of all laws and regulations pertaining to the protection of natural resources within the tidal waters of the state. This division also enforces the *State Boat Act* and conducts investigations of criminal activities occurring on the Chesapeake Bay and its tributaries. With 130 employees (55% of the total force) and an operating budget of \$2,250,240 (49% of the agency budget) the division performed the activities as set forth in the accompanying table.

The **Boating Safety** Section conducts a home study course designed to promote public safety and prevent boating accidents. A staff of 2 (1% of the total force) with a budget of \$83,876 (2% of the agency budget) distributed 11,702 Basic Boating Courses and saw the course used in the curriculum of twenty-five schools.

IN A NATURAL RESOURCES EMERGENCY OR FOR ASSISTANCE TELEPHONE
(301) 267-7740 OR (301) 269-3181 TWENTY-FOUR HOURS A DAY.

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