

MARYLAND DEPARTMENT OF NATURAL RESOURCES

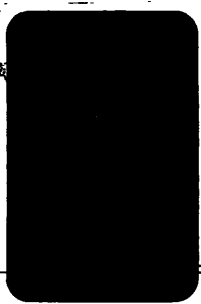
ANNUAL ACTIVITIES REPORT 1982

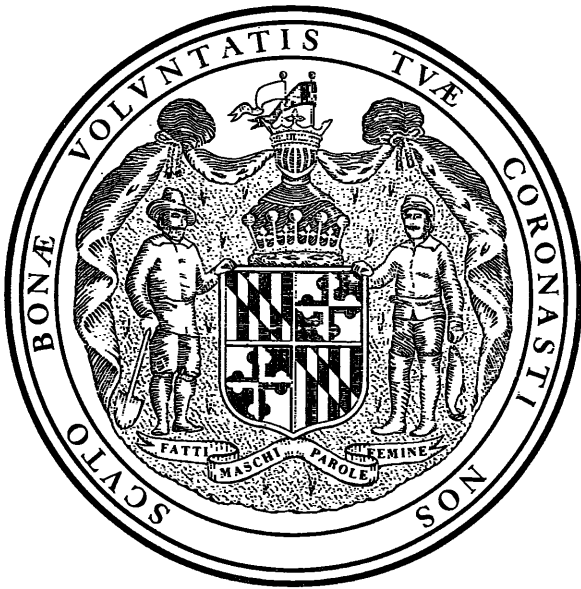
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**DEPARTMENT OF NATURAL RESOURCES
INFORMATION RESOURCE CENTER
NON-CIRCULATING**





STATE OF MARYLAND

HARRY HUGHES
Governor

LOUIS L. GOLDSTEIN
Comptroller of the Treasury

WILLIAM S. JAMES
Treasurer

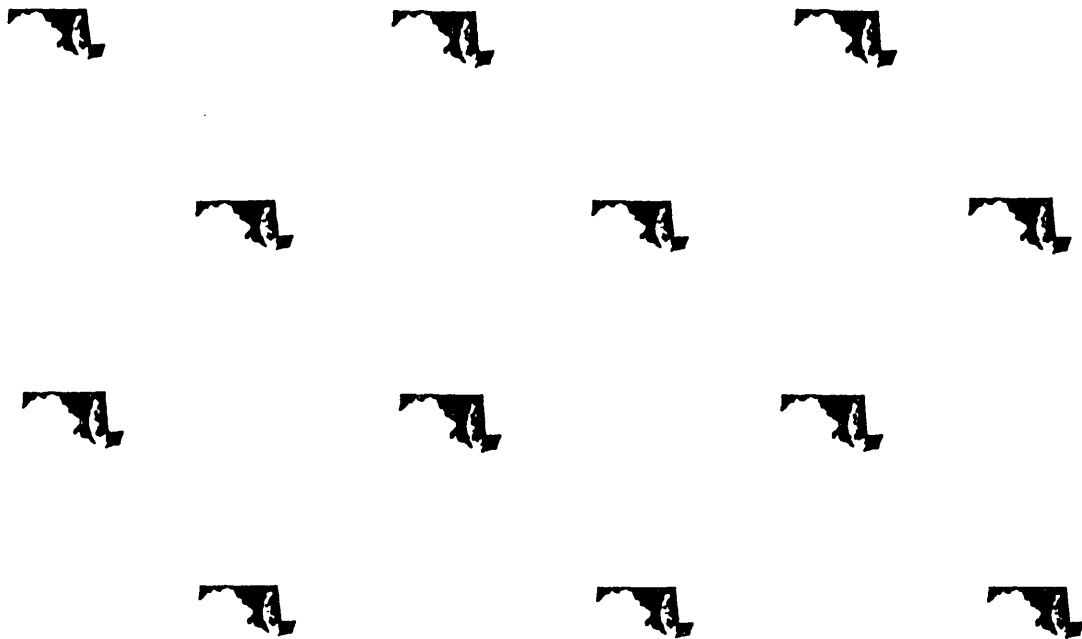
DEPARTMENT OF NATURAL RESOURCES

JAMES B. COULTER
Secretary

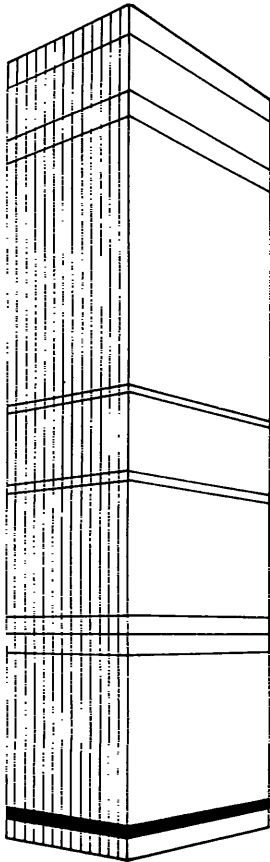
LOUIS N. PHIPPS, JR.
Deputy Secretary



MARYLAND DEPARTMENT OF NATURAL RESOURCES
ANNUAL ACTIVITIES REPORT 1982



STATE OF MARYLAND OPERATING BUDGET FISCAL YEAR 1982



PUBLIC DEBT 3.2%
 PERSONNEL 7.1%
 PUBLIC SAFETY/CORRECTION 2.8%

 EDUCATION 30.3%

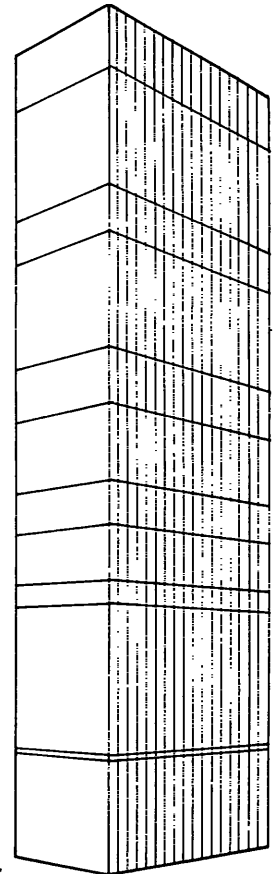
 EXECUTIVE & ADMINISTRATIVE .6%
 HUMAN RESOURCES 9.0%
 JUDICIAL & LEGAL .9%

 HEALTH 16.2%

 FINANCE & REVENUE 2.0%
 PAYMENTS TO CIVIL DIVISIONS 2.7%

 TRANSPORTATION 21.8%

 Natural Resources 1.3%
 OTHER 2.1%
TOTAL BUDGET \$5,770,189,149



OFFICE OF THE SECRETARY
 \$3,895,283 6.5%

CAPITAL PROGRAMS ADMINISTRATION
 \$8,251,806 13.7%

WILDLIFE ADMINISTRATION
 \$3,202,457 5.3%

PARK SERVICE
 \$7,850,770 13.0%

FOREST SERVICE
 \$3,860,172 6.4%

NATURAL RESOURCES POLICE
 \$5,568,883 9.2%

WATER RESOURCES ADMINISTRATION
 \$3,101,668 5.1%
MARYLAND ENVIRONMENTAL SERVICE
 \$3,866,451 6.4%
MARYLAND GEOLOGICAL SURVEY
 \$1,771,146 2.9%

TIDEWATER ADMINISTRATION
 \$10,898,882 18.0%

MARYLAND ENVIRONMENTAL TRUST
 \$84,550 .1%

ENERGY ADMINISTRATION
 \$8,065,376 13.4%

TOTAL BUDGET \$60,417,444

**DEPARTMENT OF
 NATURAL RESOURCES
 OPERATING BUDGET
 FISCAL YEAR 1982**

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OFFICE OF THE SECRETARY

EXECUTIVE DIRECTION

The Secretary, the Deputy Secretary and Assistant Secretaries of the Department of Natural Resources provide the establishment, coordination, administration and direction of departmental policy. The Office of the Secretary has final responsibility for all aspects of resources management 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 units comprising the Office of the Secretary furnish support services to all Department of Natural Resources agencies.

LEGAL AND ENVIRONMENTAL REVIEW

The Legal Section of Legal and Environmental Review has seven Assistant Attorneys General. One is Counsel to the Secretary of Natural Resources and is responsible to the Attorney General for the direction and supervision of the section. The legal staff not only represents agencies of the Department involved in litigation, but also supplies 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 1982, 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 handled 4 cases in the federal courts, initiated 10 cases at the State Circuit Court level, closed 17 other cases, and prosecuted 45 violations in the State District Courts. Assistance and advice was rendered in numerous administrative proceedings at federal and state levels.

The Environmental Review Section of Legal and Environmental

Review includes two Assistant Secretaries, (for Resource Management and for Environmental Matters) who represent the Department on interstate commissions, compacts, and, at meetings, conferences etc. The responsibility for OMB A95 Clearinghouse Review is also part of this section.

BOARD OF REVIEW

The Assistant Secretary for Resources Management serves as Executive Secretary to the Board of Review. There were no changes in the membership of the Board during the fiscal year.

During fiscal year 1982 the membership of the Board consisted of:

Chairman—John W Neumann	1984
Vice Chairman—Phillip S. Thompson	1985
William H Corkran, Jr.	1985
Stanley E. Fine	1984
Edward H. Higgins	1983
Lem E. Kirk	1983
Calman J. Zamoiski	1984

The Board conducted eight meetings during fiscal year 1982; two of these meetings were held in Talbot County, five in Anne Arundel County and one in Allegany County.

During fiscal year 1982, the Board received eight contested cases on appeal from final decisions by Units of the Department. Two of these appeals were resolved without hearing while the Board heard the appeal, decided and rendered opinions and orders for five cases. One case is still pending before the Board.

CONTRIBUTIONS TO INTERSTATE AGREEMENTS

The Department and the State are represented on many intergovernmental organizations by the Assistant Secretary for Environmental Matters. During fiscal year 1982, they included: the Susquehanna River Basin Commission; the Interstate Conference on Water

Problems; as the Governor's representative on the Subcommittee on Water Management of the National Governors' Association; the Interstate Commission on the Potomac River Basin; the Southern Environmental Resources Conference; the Maryland Committee for Training of Environmental Systems Operators; the Advisory Board of the Maryland Sea Grant Program; the State Board of Waterworks and Waste Systems Operators; the Ohio River Basin Commission; the Mid-Atlantic Industrial Waste Conference; and the Water Pollution Control Federation.

Some features, and activities of these organizations are:

The Susquehanna River Basin Commission (SRBC) implements a 100 year Federal/State Compact approved in 1970 between the states of New York and Maryland, the Commonwealth of Pennsylvania and the U. S. Government.

The Interstate Conference on Water Problems (ICWP) is a national association of State, intra-state, and interstate officials concerned with water resources matters. Activities include communicating information on federal decisions which affect states rights or non-federal rights in water management, and providing a link to the federal government.

In order to serve its membership better, ICWP recently established an office in Washington, D.C. ICWP has been active in a variety of issues; amendments to the Water Resources Planning Act, Ground Water Management, Section 404 Program, Dam Safety, and, Urban Water Systems.

The National Governors' Association Subcommittee on Water Management develops policy positions representing the consensus of the states on water resources issues. The NGA Subcommittee developed a comprehensive statement on water policy: *Fundamental Principle For A National Water Policy*.

The Interstate Commission on the Potomac River Basin (ICPRB) is an intergovernmental agency established in 1940 to coordinate environmental programs among the jurisdictions of the basin which include the District of Columbia, Maryland, Pennsylvania, Virginia, West Virginia, and the Federal Government. ICPRB has been active in evaluating basin-wide water quality monitoring, assisting the jurisdictions in managing water supply and water pollution control programs, and, establishing a technical section on water supply operations in the basin.

The Southern Environmental Resources Conference is a regional interstate organization of 19 states dealing with environmental issues in the South. It serves as a forum for the interchange of ideas and experiences and develops policy positions on critical environmental issues.

The 1982 annual meeting of the Mid-Atlantic Industrial Waste Conference was held in Maryland, on the College Park Campus of the University of Maryland. The conference dealt principally with the management of hazardous wastes.

The Ohio River Basin Commission (ORBC) was terminated by the President on September 30, 1981. Its primary goal was to engage in comprehensive planning, to develop priority reports, and to establish a schedule of project and program activities in the basin. Maryland and eight other Ohio River Basin states decided on September 1, 1981 to continue an organization of states dealing with issues of common concern and interest in the basin.

FISCAL AND SUPPORTIVE SERVICES

This program serves the financial needs of the twelve (12) agencies within DNR. In order to accomplish this charge efficiently and economically, the program is further divided into five projects: General Accounting, Special, Federal and Capital Fund Management, Sup-

portive Services, Internal Auditing, and Wage and Hour Section.

General Accounting

The primary responsibility of this project is to record the annual budgetary appropriation; authorize the Comptroller to disburse funds; receipt and allocate revenues attained; maintain fiscal controls over the operating budget; and provide fiscal information to the unit directors.

During the 1982 fiscal year the operating budget reflects an expenditure of approximately \$60 million. During the same fiscal year approximately \$32 million was receipted and allocated to the various units.

Accounts receivable documentation was provided on approximately 3,600 individual accounts totalling \$1,940,547.

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 602 specific projects totalling \$33,882,342.55. These projects are financed as follows:

Type	No. of Projects	Amount
Shore Erosion	55	2,164,115.23
Waterway Improvements	127	2,594,752.43
Outdoor recreation	235	14,331,903.97
Land Loans		
General Construction Loans	74	2,694,228.10
Federal Grant Projects	111	12,097,342.82

Supportive Services Section

The Supportive Services Section's primary duty is controlling the real and personal property purchased or otherwise received by each unit within the department. As of June 30, 1982, the value of the land and buildings to which the department holds title exceeds \$186 million with equipment inventory amounting to

\$17 million. Included with the equipment are 213 sedans, 612 trucks, 816 boats, and one (1) airplane.

This section also purchases or coordinates the purchase of all equipment and supplies. Approximately 3,460 out-of-schedule requisitions, capital fund requisitions, warehouse requisitions, and departmental purchase orders were prepared, logged, verified, computed, and processed for payment, amounting to \$2,998,556.72.

Mail Distribution

This office oversees the operation of the departmental mail room. During fiscal year 1982 it is estimated that more than 4,500,000 pieces of mail and 20,000 parcels were handled.

Internal Auditing Section

The Internal Audit's responsibility is to ensure the accountability of all current and fixed assets acquired by the department and to inspect each of its more than 300 regional work and service centers for compliance with all applicable fire and safety codes.

Wage and Hour Section

The Wage and Hour Section ensures employees are paid on time, maintains an accurate work and leave record for each employee and prepares the personnel section of the operating budget. This section also coordinates the retirement and the health and accident activities between employees and the respective regulatory agency.

Data Processing

The Data Processing Section successfully completed the replacement and major enhancement of the Department's Data Processing equipment. A Four-Phase mini computer and associated software was installed in March of 1982. This equipment replaced the IBM Remote Job Entry equipment and eight of the ten card keypunch machines. All major applications utilizing punched cards have been converted to the new equipment.

Ten additional multi-function CRT terminals have been installed in various departments for data entry, word processing and job submission.

The increased efficiency and reduced unit cost of the new equipment will make it possible to implement a variety of applications utilizing the functions of the data processing section within the department.

LICENSING AND CONSUMER SERVICES

Licensing and Consumer Services administers the State Boat Act and the licensing provisions under the Wildlife and Tidewater Administrations. The section titles and registers all boats; records security interest in boats; issues commercial and sport licenses and permits; collects shellfish taxes and licenses and audits boat and shellfish dealers. The five Natural Resources Regional Service Centers are under the supervision of this section. This unit is also responsible for the Boat Act Fund, the Boat Dealer Assurance Fund, the Publication Sales Fund and the sale of the Guide for Cruising Maryland Waters and certain other Department publications.

The six Licensing and Consumer Services Offices collected gross revenues of \$11,419,008 representing over 796,233 transactions. Included were 25,839 applications for Maryland boat titles resulting in \$4,256,661 in boat title taxes collected; 117,813 applications for boat registrations resulting in revenues of \$527,162; 5,492 applications for documented yacht stickers totaling \$27,357; also 560,713 applications for various angler and hunting licenses and stamps resulting in deposits of \$4,038,528 and 36,086 applications for commercial licenses for revenues totaling \$580,876. A total of \$52,360 was collected for the recordation of security interest with \$20,940 deposited to the account of the Comptroller of the Treasury, \$14,710 made available to be distributed to the counties and \$16,710 available to offset costs of the collection and re-

cordation. Gross revenues from publications were \$55,875 of which \$48,038 was generated from the sale of the Guide for Cruising Maryland Waters.

Licensing and Consumer Services staff processed 117,813 boat registrations of which 12,381 were issued for three years free-of-charge. Also processed were 6,835 oyster and clam dealer reports which accounted for over 3,853,707 taxed bushels of shellfish (2,390,798 harvested bushels) and \$1,027,462 in severance, import and export taxes. The Licensing and Consumer Services Staff provides daily direction and interaction between the Department and the 558 licensed boat dealers, 40 licensed soft-shell and hard-shell clam dealers, 158 licensed oyster dealers, 24 clerks of court, 11 hunting and fishing license distributors, 160 hunting and fishing license consignment agents and 450 hunting and fishing license cash agents as well as the general public.

Licensing and Consumer Services Staff at the five Regional Service Centers, in addition to the issuance of titles, registrations and licenses, provide comprehensive administrative support to the Regional Managers and field personnel of all units of the Department located at the centers. The Regional Service Center in Southern Maryland collected \$9,499 on behalf of the Potomac River Fisheries commission through sales of Potomac River Fisheries Commission Licenses and deposited the money direct to the Potomac River Fisheries Commission's account.

In addition, Licensing and Consumer Services collected and deposited to the State's accounts \$842,228 in miscellaneous permits and sales.

Of the sport fishing and hunting licenses recorded as sold 16,095 were returned by retail agents resulting in \$173,349 in refunds. The net revenue from anglers and hunting licenses is \$3,866,178.67.

Of revenues collected during Fiscal Year 1982, \$11,401,507 was used to support the activities of the Tide-

water Administration, the Wildlife Administration, the Forest Service, the Natural Resources Police, the Capital Programs Administration and the Office of the Secretary.

Licensing and Consumer Services total costs for Fiscal year 1982 to accomplish these services was \$1,505,228.

NATURAL RESOURCES ASSISTANCE AND INFORMATION

The Office of Assistance and Information gives the public direct access to the services of the Department of Natural Resources. Also, the Office serves as a public interest center where information about activities of the Department may be obtained. To accomplish its mission, the Office uses traditional communication methods such as media releases, public service messages on television and radio, distribution of pamphlets and brochures, direct mail, telephone responses, circulation of motion pictures, books and slides and public appearances.

In addition, the Office provides support for the line agencies of the Department in their public communication efforts. Capabilities of the Office in this function include coordination of exhibits at fairs, festivals and special observances; provision of mechanical services at public hearings conducted by the agencies; and assistance in preparation and distribution of required media advertisements and general mailings for the agencies.

During Fiscal Year 1982 the Office of Assistance and Information consisted of these units: General Direction, Library, Graphics Services, and Extension Specialists.

General Direction

The administration of Assistance and Information is the general responsibility of the General Direction unit. Specifically, in Fiscal Year 1982, General Direction processed all mail addressed to the Secretary of Natural Resources; maintained contacts with media and officials of other State, Federal, county and

public agencies. General Direction is aware of all issues and developments in natural resources matters.

The unit conducts the annual Migratory Waterfowl and Trout Stamp Design Contests; prints and revises the Departmental telephone directory and keeps current the DNR sections of the State and public telephone directories; compiles the DNR News, the DNR Calendar of Events, maintains a current register of public participation groups associated with the department; provides staff support for the Advisory Board of the Secretary of Natural Resources and publishes the Department's Annual Activities Report.

Library

The DNR Library is on the first floor of the Tawes State Office Building. Its services are available to DNR employees and the general public. Its activities include maintenance and circulation of the department film collection; organization of the book collection; service as repository for departmental publications and reports; participation in the interlibrary loan program; and offering of technical and reference assistance.

The department film collection includes nearly fifty titles on fish, game, conservation and natural resources activities. Films were loaned for public use on more than 766 occasions during FY '82.

Graphics Services

Two illustrators provide graphic arts services for the agencies of the Department, producing publications, exhibits, maps, posters and similar elements of communication.

Extension Specialists

The extension specialists provide the Secretary of the Department close contact with the State's citizens and others affected by the Department's legal mandate.

The extension specialist functions as the Department's liaison in the field.

Extension specialists participate in meetings with citizen's groups, make speeches, respond to field assistance requests by clubs, schools,

landowners, and other groups. Additionally, extension personnel render assistance to all Department agencies, cooperate with local and federal governments, conduct seminars, and represent the Department at expositions, fairs, and special events.

Personnel Administration

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

Personal Administration Activities	
TRANSACTIONS PROCESSED	5343
Appointments (PA)	154
Seasonal	949
RECLASSIFICATIONS	363
PROMOTIONS	21
SALARY ADJUSTMENTS	36
POSITION ACTIONS	889
(Abolish/create; Transfer between units, programs and departments; Fund changes)	
SEPARATIONS	1100
MISCELLANEOUS	1768
(Project, Name, Code, Fund, Class and Status changes, I.D. Requests; Exemption Bonds, Address and Beneficiary Changes; EOD Inquiries, etc.)	
RECLASSIFICATION STUDIES	190
Desk Audits	32
SPECIFICATIONS REVISED	1
SUGGESTIONS PROCESSED	3
Cash Awards	2
Pending	3
BLOOD PROGRAM	
Drives	3
Donators (Average/drive)	100
Disbursement	48
INTERVIEW AND MOVING	
Expense Requests	4
EXAMINATIONS REQUESTED	18
EXAMINATIONS ADMINISTERED	2
APPLICANT ACTIVITY	
Correspondence	675
Walk-Ins	402
Interviews	156
Telephone Inquiries	2250
Employee Reviews	100
EMPLOYEE GRIEVANCES	15
(4th and 5th Step Hearings)	
MISCELLANEOUS CAMPAIGNS	
(ID Program Deferred Compensation)	3

Flu Innoculations)

ANNUAL SALARY REVIEW

Requested New Classes	14
Requested Salary Adjustments	29
Approved New Classes	0
Approved Salary Adjustments	34

Delegated one staff member to statewide consultant study to develop a new state classification system (6 months).

OFFICE OF EEO & MANPOWER

This office provides consultant services to the Department and its agencies for Affirmative Action and Equal Employment Opportunity. The following priorities have been established as EEO activity with the Department:

1. Recruitment and reclassification to include revision of job specifications and filling vacancies.
2. Assisting units in preparing an Affirmative Action Plan and training personnel in Equal Employment, Affirmative Action/Management Development.
3. Proper and expedient investigation of complaints of discrimination.

Summary of Activities for Previous Year

Training modules conducted	3
Affirmative Action Training	86
Sexual Harassment	37
Employee Motivation and Management Theories	32
Coordinated a Management By Objective Course through the Management Development Center.	20
Technical Assistance	20
Personnel Referrals	85
Conference and Workshops	8
Attended	
Career Days	6
Guest Lectures	4
Counseling	83
Advisory & Review Boards	7
Served	
<i>Ongoing Activities</i>	
Additional Presentations:	
Effective Communication	
Grievance Procedure	
Structured Interview Techniques	

CAPITAL PROGRAMS ADMINISTRATION

Budget \$8,251,806
Number of Staff 81

The Capital Programs Administration includes four programs: Land Planning Services, Program Open Space, Shore Erosion Control and Land and Property Management. 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 Program Open Space funds under the provisions of the Outdoor Recreation Land Loan of 1969 and Federal Funds provided by the U.S. Department of Interior's Land and Water Conservation Fund, and provides shore erosion control services to public and private landowners.

LAND PLANNING SERVICES

Land Planning Services provides planning and mapping services for the acquisition, development, and resource management of public lands and scenic rivers administered and/or managed by the Department.

The activities of Land Planning are accomplished through four primary projects: Park Planning, Wild and Scenic Rivers, Acquisition Graphics and Research, and Natural Heritage and Environmental Review.

THE PARK PLANNING PROJECT

Develops master plans for new state parks, or, a recreation use and development modification of existing state parks. Throughout the planning process, DNR agencies, interested citizens, citizen advisory committees, elected officials, and federal, state, and local government representatives participate in generating, refining, and evaluating these master plans. Public information meetings and public hearings are required prior to final plan adoption.

During fiscal year 1982, Park Planning was actively involved in

the development or planning process with the following parks, natural environment areas, wildlife management areas or tracts:

Cunningham Falls State Park/Catoctin Furnace Complex
Dan's Mountain State Park
Dundee-Saltpeper Creek
Elk Neck State Park
Fair Hill Natural Resources Management Area
Fort Frederick State Park
Garrett County Lands Consolidation Plan
Gunpowder Falls State Park
Hart-Miller Island
Mattawoman Natural Environment Area
Merkle Wildlife Management Area
Monocacy Natural Resources Management Area
Patapsco State Park
Stoney Forest/Peverly Tract

THE WILD AND SCENIC RIVERS PROJECT

Prepares resource management plans for the nine rivers that comprise the system; promotes the wise use of the rivers' land and water resources; improves resource conservation measures; and administers the Youghiogheny Wild River Regulations. This project works with local citizen advisory boards and local governing bodies to develop resource recommendations for use by the appropriate governing body. Project works for fiscal year 1982 included:

Anacostia River
Monocacy River
Patuxent River
Pocomoke River
Seyern River
Youghiogheny River
American Rivers Month
Save Our Streams
Maryland Rivers Inventory Study

THE ACQUISITION GRAPHICS AND RESEARCH PROJECT

Researches property records (deed, surveys, and land patents) and prepares project boundary maps which graphically illustrate all private properties legislatively authorized for acquisition to complete public ownership of DNR managed lands. This project also provides mapping and property research for the oil and gas leasing program and other State agency projects and prepares the Department's acreage report.

Project boundary maps were completed for Dundee-Saltpeper Creeks, Greenridge State Forest, Susquehanna State Park, Greenbrier State Park, and Stoney Forest Demonstration area.

Major updates and revisions were made to the project boundary maps for Tuckahoe State Park and Gunpowder Falls State Park. Project boundary maps for Dan's Mountain State Park and Wildlife Management Area, Patapsco Valley State Park, and Ocean City Beach Erosion District are in progress. Work on the project boundary maps for Pocomoke State Forest and Scenic River and Savage River State Forest has also been started and will continue through fiscal year 1983.

OIL AND GAS LEASE MAPPING

County and Regional location maps for Washington, Allegany and Garrett counties have been designed and drafted. The format for the tract maps and reference lists has been designed. The tract map for Potomac State Forest has been completed. Boundary and ownership information for DNR areas in Western Maryland is being researched and drafted onto tract maps.

THE NATURAL HERITAGE AND ENVIRONMENTAL REVIEW PROJECT

Is responsible for systematically collecting, recording, and analyzing the State's natural vegetation and aquatic diversity including rare, endangered, or threatened species. The Natural Heritage project is also responsible for the preservation of representative elements of the State's natural heritage including rare and endangered species and communities of flora and fauna; integration of natural heritage preservation with existing State programs; research and data acquisition; and distribution of information available from the Natural Heritage Program.

The Natural Heritage project conducts environmental reviews as requested by DNR projects and lands. These reviews include detailed inventories of natural and man-made resources, rare and endangered species, natural conditions and processes, attributes and limitations to use of the area, and regional setting.

The Maryland Natural Heritage program serves as the national model and is the standard for approximately thirty state Heritage programs.

During fiscal year 1982, the Heritage staff demonstrated the program to citizens' groups, governmental agencies, and private organizations. A brochure describing the program was published. One hundred and fifty data requests from all sources were filled. Approximately 50% of these were from divisions of state government. Other requests included federal government agencies, non-profit groups, county governments, consulting firms and academia.

PROGRAM OPEN SPACE

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

Program Open Space coordinates the purchase of Natural Resources lands, and the design and

development of Natural Resources facilities. Program Open Space also obtains federal grants to assist funding land acquisition and development, administers state and federal grants to Maryland's subdivisions for local recreation and open space, and coordinates development and maintenance of the Helen Avalynne Tawes Garden.

The following charts compare fiscal year 1982 accomplishments with fiscal year 1981 activities and highlight the numbers and varieties of projects that were approved during fiscal year 1982.

Engineering and Design

This project designs capital projects for the Department of Natural Resources. Activities include writing design programs, serving as agency member on the General Professional Services Selection Board, participation in meetings with consultants, review of plans and specifications, in-house design work, and, development of a plan for future preservation, adaptive reuse or other disposition of historic buildings and sites in cooperation with the Maryland Historic Trust.

Acquisition and Development

This project is charged with the acquisition and development of capital projects for DNR. In fiscal year 1982 DNR continued to pursue its acquisition goals and the Department started work on 16 projects with a construction cost of \$2,503,787.

ACQUISITION—STATE PROPERTY

Program Open Space continued to acquire acreage during fiscal year 1982 aiming to meet the Department's goal of 403,459 acres. These lands have been purchased under the State apportionment of the Annual Program Open Space funds, not to be confused with the local portion of these funds. The Department owns 308,889 acres of land and 9,311 acres in easements as follows:

State Parks	72,208 acres
State Forests	127,247 "
Wildlife Management Areas	79,629 "
Fish Management Areas	1,031 "
Natural Environmental Areas	13,597 "
Natural Resources Management Areas	13,903 "
Energy and Coastal Zone	1,045 "
Miscellaneous	229 "
Total	308,889 acres
Easements	
Maryland Environmental Trust	9,302 acres
Maryland Environmental Service	9 "
Total	9,311 acres

At present the Department of Natural Resources through Program Open Space receives approximately \$7,600,000 a year for the acquisition of land.

CONSTRUCTION PROJECTS—STATE PROPERTY

The following projects were under construction during FY 1982

Albert Powell Hatchery—Sewage Plant	\$123,892
Fort Frederick Visitor Center	298,831
Greenbrier Concession	168,800
Rocky Gap Group Camping Area	262,908
Seneca Phase II Roads and Utilities	639,205
Seneca Phase II Buildings	175,000
Tuckahoe Day Use Area	157,905
Tuckahoe Storage Buildings	49,592
Matapeake Roofing	14,979
Patapsco Area III Road work	173,850
Johnson Substation—Well	2,305
Natural Resources Police	
Paint Radio Towers	2,725
Tuckahoe Visitor Center	375,587
Rocky Gap Ventilation System	14,568
Rocky Gap Paint/Oil Storage Building	5,482
Matapeake Vehicle Fueling System	38,158
Total	\$2,503,787

Construction Crew—During fiscal year 1982, Program Open Space continued with one construction crew. The crew completed two major buildings in fiscal year 1982, Assateague State Park and Fair Hill Natural Resources Management Area as well as other maintenance projects.

Fiscal Administration

GRANTS

The Department of Natural Resources administers two grant programs to assist the State, counties, cities, and towns with park land purchases and development of recreational facilities.

Program Open Space, formally known as the Outdoor Recreation Land Loan of 1969, is the major grant program, totalling \$295,600,000 through fiscal year 1983.

Supplementing Program Open Space is the Federal Land and Water Conservation Fund totalling \$55,812,704 through fiscal year 1981. The federal grants have been fully utilized in Maryland since 1966.

The objective of the grants staff is to obtain Federal Grants to supplement State Natural Resources acquisition and development programs and 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.

There were no Federal apportionments of Land and Water Conservation Funds to any state for fiscal year 1982.

Maryland obligates the entire Federal allocation. A streamlined procedure quickly obligates each annual apportionment guaranteeing reimbursement of these Federal funds to Maryland and its subdivisions.

During the 1982 session the Maryland General Assembly approved the fiscal year 1983 Program Open Space allocation of \$24,000,000.

LAND AND WATER CONSERVATION FUND REIMBURSEMENT ACCOUNT RECORD SYSTEM

Land and Water Conservation Fund monies reimbursed to the State are deposited in the "Federal Fund Account" for State and local projects. The apportioned funds are divided equally between the State and local subdivisions. During fiscal year 1980, a record-keeping system to closely monitor the use of the "Federal Fund Account" was established. The maintenance of this record insures the recovered funds will be available to meet local obligations as well as enable the State to realize the full utility of the cash balance on hand.

REIMBURSEMENT

Federally Assisted State Projects—In FY 1982, the State was reimbursed \$2,218,969 from the Land and Water Conservation Fund administered by the Department of the Interior. Of this amount \$49,109.78 went to the Department of State Planning to fund the preparation of the State Comprehensive Outdoor Recreation Plan and Baltimore City received \$189,122.62 for the development of Reedbird Park and School 101 Recreation Area. The Department of Natural Resources received \$95,092 for indirect costs associated with the Administration of Land and Water grants. The remaining \$1,885,644.60 represents 50% of the costs incurred to acquire and develop Maryland's parks.

One-half of the federal funds allocated are made available to the local subdivisions; the other half is used for the acquisition and development of State park facilities.

State Assisted Local Projects—Program Open Space also administers the Outdoor Recreation Land Loan. In fiscal year 1982, the state reimbursed \$14,232,985.30 to the local subdivisions for costs incurred on local parks, acquisition, and development projects.

The local subdivisions were reimbursed \$2,191,922.51 from the re-

GRANTS STATUS PROGRAM OPEN SPACE (LOCAL SIDE) & THE LAND AND WATER CONSERVATION FUND June 30, 1982

Regular Apportionment

Grant Program	Fiscal Year	Acq. Projects Received	Dev. Projects Received	Acq. Projects Approved	No. of Acres Approved	Dev. Projects Approved	Total Funds Approved	Total Funds Reimbursed	Unencumbered Balance as of June 30, 1982
Local POS	FY 81	43	93	46	598.3	127	\$18,962,102	\$10,507,531	\$10,773,789
	FY 82	37	92	39	925.3	141	\$12,259,826	\$14,232,985.30	\$11,251,899.91
Federal LWCF	FY 81	2	12	2	373.64	12	\$ 824,094	\$ 4,352,450	-0-
	FY 82	2	4	2	398.70	4	\$ 1,938,860*	\$ 2,218,969	\$ 252,653.36**

* There was no FY 1982 allocation from the Land and Water Conservation Fund. These funds were deobligated from an existing project.

** These funds were reallocated to the State from underruns on completed projects. These funds will be obligated by September 30, 1982

covered Land and Water Conservation Funds. Of this amount, \$2,002,799.89 was reimbursed from Federal funds recovered on State Park projects. The remaining \$189,122.62 were directed Federal grants to the local subdivisions through the Land and Water Program.

Shore Erosion Control

The Shore Erosion Control Program provides 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. In addition, program personnel also perform administrative functions in the management of design and construction contracts and have overall responsibility for the operation of the Shore Erosion Control Revolving Loan Fund.

Recreation and Leisure Services

This program provides technical assistance to other state units, counties, municipalities, corporations, organizations, groups, and individuals in planning, organizing, and conducting leisure activities and recreation programs. Some of them are:

A Resources Library which is maintained for research and study in the recreation, park, and leisure services field. The library is available to requesting groups and individuals.

A Field Work Program provides training for volunteers from area colleges and universities with recreation and park curricula. Part of the course includes a one semester on-the-job training.

Recreation Reflections is a bi-monthly publication distributed to all recreation and park departments, schools with recreation-related curricula, therapeutic institutions, and directors of major

agencies within the Department of Natural Resources. The specific purpose of the publication is positive communication between the Department of Natural Resources and local agencies through the provision of the technical assistance and grants information as well as legislation updates and sources of valuable professional resources.

Promotional Displays are designed and set up by the unit each year at the Maryland State Conference for Recreation and Leisure Services, the Maryland Association of Counties Annual Meeting, and the yearly meetings of the Maryland Municipal League.

Other activities include trips to local governments in answer to specific requests for service, such as, source of grants, layout and design of recreational areas, acquisition of land, recreation program development, guest lectures, workshops on specific subjects, organization and establishment of recreation commissions and councils, and referrals to other agencies. To assist local agencies in understanding their role in recreation and parks, a brochure was published describing and explaining the State Recreation Enabling Law.

A Directory for Maryland County and Municipal Recreation and Park Boards or Commissions—compiled annually by the unit, lists all departments, county or mu-

SUMMARY OF GRANT PROGRAMS SINCE EACH PROGRAM'S BEGINNING

June 30, 1982

Regular Apportionments

Grant Program	Number of Project Applications	Total Allocations Regular Apportionment	Amount of Allocation Obligated for Projects	Unencumbered Balance of Allocation	% of Allocation Obligated	Amount Allocation Reimbursed
Local POS FY 70-82	1712	\$138,800,000	\$124,548,100	\$11,251,000	92%	\$107,978,103
Federal LWCF FY 65-82	332	53,552,196	53,552,196	-0-	100%	38,313,685
Total	2044	189,352,196	178,100,296	11,251,900	96%	146,291,788

nicipal, in the state, all boards and commissions, recreation department directors, administrators, and chairmen of the recreation and parks advisory board and all board members.

Land and Property Management

The Land and Property Management Program was created on July 1, 1979 within the Capital Programs Administration. This program consists of six projects: General Direction; Real Property Control and Maintenance; Fair Hill Natural Resources Management Area; Wye Island Natural Resources Management Area; Monocacy Natural Resources Management Area; and Deep Creek Natural Resources Management Area. The goal of the Land and Property Program is to maintain an up-to-date record of all Department of Natural Resources Properties and management of certain lands in a "land bank" status until master plans are prepared and their ultimate use is determined.

General Direction is responsible for the overall coordination of the Land and Property Management Program which includes the budget preparation, administration and planning.

In addition to Fair Hill, Wye Island, and Monocacy which are managed in the "land bank" state,

the Land and Property Management Program manages the Deep Creek Lake under an agreement with the PENELEC Company to provide recreational opportunities on Deep Creek Lake.

The Real Property Control and Maintenance Project maintains all records associated with land owned by the Department of Natural Resources. This includes deeds,

leases, easements, right-of-way, etc.

The Land and Property Management Program also administers Camp Echo Lake, represents the Department on the C & O Canal National Historical Park Advisory Commission, and aids in the administration of the Helen Avalynne Tawes Garden at the Tawes State Office Building Complex in Annapolis.

SHORE EROSION CONTROL
FY-82 ACCOMPLISHMENTS

Technical Assistance Actions.....	137
S.E.C. Loan Applications Processed.....	28
Engineering Contracts Awarded.....	9
Construction Projects Bid.....	23
Construction Contracts Awarded.....	17
S.E.C. Loans Processed.....	31
Length of Shoreline Protected by:	
Timber Bulkheads.....	2,183
Steel Bulkheads.....	208
Stone Revetments.....	7,648
Gabion Revetments.....	1,218
 Total.....	 11,257 or 2.13 miles
Number of Projects Completed.....	24*
Number of S.E.C. Loans Involved.....	22
Amount of S.E.C. Funds Loaned.....	1,050,608.50
Total Cos. of Construction.....	1,986,555.72
Completed	

*Includes one S.E.C. District, one Community and four State Projects.

SHORE EROSION CONTROL PROJECT STATUS
AS OF JUNE 30, 1982

No. of Projects	Project Status	No. of Loans	SEC Loans	Property Owner Contributions	Capital Construction Funds	Total Construction Cost
24	Completed	22	\$1,050,608.50	\$ 142,474.25	\$ 793,472.97	\$ 1,986,555.72
8	Under Construction	15	739,196.79	73,520.74	—	812,717.53
7	Construction Pending	15	395,884.00	9,413.00	323,750.00	729,047.00
1	Contracts Pending	1	193,209.00	—	—	193,209.00
1	Scheduled For Bid	1	55,000.00*	5,000.00*	—	60,000.00*
8	Under Design	11	689,500.00*	45,500.00*	—	735,000.00*
55	Projects Pending	68	2,991,700.00*	975,900.00*	1,726,430.00*	5,694,030.00*
104**		133	\$6,115,092.29	\$1,251,807.99	\$2,843,652.97	\$10,210,559.25

*Estimated

**Includes projects for the Town of Chesapeake Beach, Five SEC Districts and nine on State owned property.

WILDLIFE ADMINISTRATION

Budget \$3,202,457
Number of Staff 120

GENERAL DIRECTION PROGRAM

The inland fish and wildlife resources of Maryland are widely used by citizens who spend millions of dollars each year in fish and wildlife related recreation. Approximately 300,000 sportsmen purchase hunting and fishing licenses annually 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 inland fish and wildlife management and research efforts are financed almost entirely by hunters and fishermen; thus the major emphasis of management is directed toward game animals. However, all wildlife species are considered in management decisions with the result that non-game animals benefit from wildlife management practices.

The Wildlife Administration recommends to the Secretary of Natural Resources seasons, bag limits and methods of taking game animals, assists other state agencies and private landowners in land management and wildlife planning, issues permits and licenses for activities that directly affect wildlife, provides technical assistance for nuisance wildlife control and manages areas for public wildlife enjoyment.

The Wildlife Administration is comprised of three programs: General Direction, Wildlife Management and Inland Fisheries.

Wildlife Management Program

This section consists of five staff biological projects. These staff projects plan, conduct and evaluate all wildlife surveys, develop and apply management technique; prepare annual status reports, and, develop

recommendations for regulating public use and restoring wildlife species.

FOREST WILDLIFE PROJECT

This project manages the wild turkey, whitetailed deer, Sika deer, ruffed grouse, gray squirrel, eastern fox squirrel and red (Piney) squirrel species. These wildlife species currently provide over one million hunters' days afield.

Investigations are being conducted to determine mortality rates for the whitetailed deer and gray squirrel. Population trend surveys on deer, grouse, squirrels and turkeys were also conducted.

FURBEARER AND MARINE MAMMAL PROJECT

This project's primary responsibility is the management of eighteen species of furbearers in Maryland. In recent years, furbearer pelt sales have generated an estimated income of over \$3,000,000 to Maryland's fur harvesters.

In cooperation with Non-game and Endangered Species Project personnel, a computerized inventory of statewide bobcat habitat was developed and evaluated. Winter track count surveys designed to determine the status of Maryland's bobcat population were implemented. Additional field survey techniques to annually monitor statewide populations of foxes, raccoon, as well as bobcat, through scent station transects also have been developed.

WATERFOWL PROJECT

The wetland wildlife species 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.

Waterfowl banded in Maryland during the year totaled 5,911 ducks and 1,423 geese. Funding for cooperative banding of ducks in eastern Canada was continued.

Surveys of the changes and conditions in waterfowl habitat indicated a continued decrease in bay grasses from the previous year. Evaluation of pen-reared mallard releases was continued.

NON-GAME AND ENDANGERED SPECIES PROJECT

This project includes species of wildlife not legally classified as game birds or mammals and those species threatened or endangered. Included are: thirty-seven species of amphibians, forty-six species of reptiles, two hundred eighty species of birds and fifty-one species of mammals.

This project coordinates research responsibilities including planning and project execution for nongame and endangered species. Additional responsibilities include issuing permits for: endangered species, bird banding and scientific collecting. The Endangered Species Project of the Maryland Wildlife Administration is continuing several studies initiated over the past years.

UPLAND WILDLIFE PROJECT

The Upland Wildlife Project is responsible for the management of rabbits, quail, pheasant, doves, woodcock, 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 of quail and rabbits on a wildlife management research area. 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 continued to protect, improve, or create upland wildlife habitats on private lands and rights-of-way and, create an awareness of what upland wildlife habitat actually is and the need for management.

MARYLAND WATERFOWL RESTORATION PROJECT

The alarming decline in the numbers of dabbling ducks (mallards, black ducks, teal, gadwall, wood ducks, etc.) in Maryland, and North America, in recent decades has been directly related to destruction and degradation of wetland habitats required for breeding and wintering.

In Maryland, drainage for agriculture and mosquito control, dredging and spoil disposal, solid waste disposal and development for industry, housing, marinas and public works have resulted in the destruction of more than 40 percent of the half-million acres of wetlands that existed early in this century.

By Chapter 482 of the Laws of Maryland of 1981, the General Assembly of Maryland enacted Section 10-308.1(e)(3) of the Natural Resources Article of the Annotated Code of Maryland. This section mandates the Maryland Wildlife Administration (MWA) to encourage waterfowl habitat conservation on private lands by entering into ten-year license agreements with private landowners for approved projects creating waterfowl habitat on their lands; and further provides that expenditures made for these approved projects pursuant to a license agreement are to be considered a contribution to the State of Maryland.

The objective of the "Maryland Waterfowl Restoration Project" is to provide technical assistance to private landowners for developing and managing waterfowl habitats

for breeding, migrating and wintering ducks. The statewide goal of the project is to improve and augment wetland habitats for dabbling ducks by providing permanent open water, properly interspersed with food and cover, throughout the year.

The Waterfowl Restoration Project does not retire crop land from production nor does it open land to the public; that is left entirely to the discretion of the landowner or tenant.

During the first year of operation, the Waterfowl Restoration Project has license agreements for 3,700 acres of valuable waterfowl habitat. Over 90% of this is found on the Eastern Shore. However, one farm located in Garrett County has come into the project and there is another cooperator in Baltimore County. More participation from Western Shore landowners is anticipated as the project becomes better known.

The second phase of the project, restoration of waterfowl habitat on public lands, included flooding of the impoundments at Fairmount and planning water control structure repair and improvements at Deal Island Wildlife Management Area. These two large projects are nearing completion.

The third phase of the waterfowl restoration project is mallard duckling release. During the year 14,000 mallard ducklings were purchased and released in all counties throughout the state. These birds were released in the best available bird-rearing habitat in the hope that they will become acclimated and return to this habitat in subsequent years.

Wildlife Field Services Section

As the name implies, this program performs the primary field operations for the Wildlife Administration. The program carries out wildlife management practices on state forests, state parks and administration owned properties as well as cooperative lands. It also serves other agency programs by providing the hands-on-work required for the five biological staff projects.

The program serves the public directly by dissemination of information regarding policy and regulations, technical assistance in planning wildlife management practices and handling animal problems as well as providing areas on which the interested public can find hunting and other forms of appreciative recreation. The total acreage of state wildlife management area is 102,300 of leased land under the Cooperative Hunt Program.

Fish and Wildlife Technical Services

This project conducts the environmental review and assessment of federal, state and local projects as they affect the fish and wildlife resources of the state. Interagency coordination and clearinghouse review are the other main functions.

The Environmental Review project has concentrated on better coordination and review of wetland projects, roads and bridges and SCS PL-566 drainage projects to mitigate the effects on the natural resources. A fulltime fishery biologist was added in 1982 to review the inland fish (non-tidal) projects statewide.

The state and federal clearinghouse (A-95) projects involving public funds are reviewed by project personnel and action is coordinated between the Wildlife Administration staff and other DNR, state and federal agencies. The Chief is also the main interagency coordinator with DNR and other local, state and federal agencies. This project handles all meetings requiring Maryland Wildlife Administration representation.

INLAND FISHERIES PROGRAM

This program is composed of a Cold Water Project and a Warm-water Project and is responsible for Maryland's inland fishery resources. All waters in streams, rivers, ponds, lakes and canals publicly or privately owned extending to the tidal boundaries designated by law

are included within this program's management responsibility.

During Fiscal Year 1982, 140,302 anglers fished in over 50,000 surface acres of non-tidal waters. Included as part of this figure are 29,000 acres of streams and rivers, 114 impoundments ranging in size from less than one acre to 3,900 acres and approximately 6,000 farm ponds.

COLD WATER FISHERIES PROJECT

Personnel in this project manage the cold water fishery resources of the State. These resources include brook, brown and rainbow trout as well as the biota and habitat associated with these fish.

The Cold Water Fisheries Project strives to provide the greatest amount of public trout fishing within existing economic and environmental limitations, while at the same time preserving and improving the natural trout resources within the State.

During FY 1982, 317,759 catchable size (8-15 inch) trout weighing 135,884 pounds (68 tons) were released into 39 streams and 28 impoundments to provide public trout fishing. Although 883 fewer fish were stocked than the previous year (1981 was the all time record for number of trout stocked), the total weight of these fish was 7,661 pounds greater than last year's total. Trout production by the State at the Albert M. Powell Hatchery and Cushwa Rearing Station was 156,000 fish (69,766 pounds) while Bear Creek Rearing Station produced 66,759 fish (34,618 pounds) for a total of 222,759 trout weighing 104,384 pounds. The U. S. Fish and Wildlife Service provided the state with an additional 95,000 trout (approximately 31,000 pounds).

Trout raised at the Bear Creek Rearing Station averaged 0.52 pounds per fish while trout raised at the Powell Hatchery and Cushwa Rearing Station averaged 0.45 pounds per fish. Approximately 16,000 two year old (12-15 inch) trout were included in the 1982 stocking program. These trout were "held over" at the State production

facilities to provide a "bonus catch" for lucky fishermen. Approximately 130,000 sub-adult and fingerling trout were also stocked into selected water of the State on an experimental basis by the Cold Water Fisheries Project.

The "Urban Trout Fishing Program" continued in those areas previously stocked and was expanded to include areas within the cities of Columbia and Hagerstown.

During FY 82, 48,902 trout stamps were sold.

Field operations of this project are aimed primarily toward Federal Aid Project F-36-R, "Survey, Inventory, and Management of Maryland's Cold Water Resources. This project consists of biological studies within selected watersheds, angler surveys and continual monitoring of known natural trout population.

During the past year intensive studies were conducted as part of F-36-R on the following streams: Beaver Creek, Carroll Creek, Deer Creek, Gunpowder River, Hunting Creek, Laurel Run, Paint Branch and Patuxent River. Antietam Creek is being studied in conjunction with Hagerstown Junior College.

During FY 82, in addition to routine monitoring of native and recreational trout streams, streams located in eleven watersheds (sub-basins) were sampled as part of the environmental review process.

Three undocumented native trout streams were found in FY 82, bringing the total number in Maryland to 119.

Recreational trout stream sampling determined suitability of streams for some kind of stocking program, checked for holdover of stocked trout, and/or protection via environmental review.

Limnological sampling was conducted in Hunting Creek Lake and Greenbrier Lake during FY 82 to determine available cold water habitat within these impoundments and the characteristics of the outflow from them. Reproducing brown trout populations exist in both lakes below the im-

poundments and are affected by the outflow.

Fishermen were interviewed during the spring of 1981 in order to determine harvest rate and resource usage on Beaver Creek (Washington County) and Middle Creek (Frederick County). Because these streams opened to spring fishing on different dates, and are in close proximity, the creel census was also intended to determine whether opening both on the same day would ease the fishing pressure on them.

The Cold Water Fisheries Project continues to cooperate with DNR's Water Resources Administration and the Department of Health and Mental Hygiene environmental review of proposed projects associated with Class III and Class IV Waters of the State.

A comprehensive plan for cold water fisheries management is still being developed. The tentative completion date for this plan is 1983.

WARMWATER FISHERIES PROJECT

The Warmwater Fisheries Project manages nine game fish, 15 panfish and 65 rough and forage fish species.

Fish species reared at Joseph H. Manning Warmwater Fish Hatchery included large and smallmouth bass, striped bass, striped bass/white bass hybrids and forage fish. Walleyes were not reared in FY 1982 because eggs were not available from the Pennsylvania Fish Commission.

Two Inland Fisheries Work Centers also reared warmwater fish species; largemouth bass at Unicorn and striped bass at Lewistown.

Fish populations of 35 state-owned ponds were checked for bass reproduction. Twenty-five were found to be in balance, seven had competitive fish species, one had overcrowded bass and two had overcrowded sunfish. Management practices were recommended for ponds not having balanced populations.

Walleye stocked in the Potomac River and Deep Creek Lake in 1980 are being caught by anglers and range in size from 14 to 20 inches. Growth of walleye in the Potomac River is exceptionally good.

Striped bass and striped bass hybrids were stocked in a number of Maryland impoundments in 1981. Sampling efforts and reports by anglers indicate some stockings were successful. Evaluation will continue in FY 83.

Final reports were completed concerning an investigation of the physical-chemical characteristics, benthic macroinvertebrates and fish populations of the upper Potomac River; and an investigation of smallmouth bass in the Susquehanna River below Conowingo Dam and the effects of the dam on water quality, fish and benthic macroinvertebrates.

An intensive effort, started in FY 1981, to monitor and evaluate the results of stocking largemouth bass in upper Chesapeake Bay was continued. Before the stocking program began, one year old fish made up 28% of the bass population, the figure now is 42%.

Studies to measure and evaluate basic physical and chemical characteristics of Maryland lakes and ponds for species suitability and their capability to sustain fish populations; and to determine species composition, relative abundance, food habits and age and growth to produce information necessary in preparing management plans for each water surveyed were continued. The surveys were conducted in the following impoundments:

Unicorn Lake	St. Mary's Lake
Triadelphia Reservoir	Bennett Cert Pond
Westminster Pond	Hampstead Lake
Lake Hashawha	Farm Museum Pond
Clopper Lake	

A statewide stream survey initiated during 1980 to provide information on physical-chemical characteristics, species composition, distribution, relative abundance of benthic macroinvertebrates and fish in various river basins in Maryland, continued in FY 82. Stream surveys included Wills Creek, Casselman River, Patuxent River, Marshyhope Creek and Chester River.

The following numbers of warm-water species were stocked into selected waters of the state during FY 82.

fry	largemouth bass	176,000
fingerling	largemouth bass	7,000
adult	channel catfish	5,625 lbs.
fingerling	channel catfish	7,200
fry	smallmouth bass	31,800
fingerling	smallmouth bass	260
fingerling	bluegill sunfish	188,600
fry	striped bass	1,200,000
fingerling	striped bass	38,000
fry	striped bass/white bass	99,000
fingerling	striped bass/white perch	30,800
10" - 12"	tiger musky	4,000

MARYLAND FOREST AND PARK SERVICE

The Forest and Park Service unit represents the combination of the Forest Service and the Park Service, which previously operated as individual units within the Department, under one Director. Today, as one unit, the Forest and Park Service will efficiently deliver services to the public by eliminating duplication of efforts. Three programs work to accomplish the mission of the Forest and Park Service; to manage the natural, cultural, historical and recreational resources to provide the best use for the benefit of people.

GENERAL DIRECTION

This program provides direction, administrative support and services to the other two programs in Forest and Parks. Budget, personnel, purchasing, training, fleet management, radio communications, safety, equal opportunity and public information functions directly serve the cooperative forestry program and the state forest and park management program.

COOPERATIVE FORESTRY PROGRAM

The cooperative forestry program provides assistance to private forest landowners, municipalities, and other governmental units in the management of their forests and individual trees. The goal of the program is to improve and maintain the economic, aesthetic, recreational, environmental and social contributions of trees, forests, and forest related resources for the benefit of people. The program has five major elements: cooperative forest management, resource utilization, resource planning, resource protection and urban-community forestry.

Cooperative Forest Management

Forest management assistance is available to any of the 95,800 private forest landowners in the State. This assistance is provided in the desire to place as much as forty percent (40%) of the states 2,280,000 forested acres that is in private ownership under management within a generation.

Assistance Priorities

In order to obtain the 40% land management goal, a new service assistance policy was adopted in fiscal 1982. The policy places emphasis upon the size of the ownership and the capability of the forest to produce timber. Priorities based upon size begin with ownerships of one hundred (100) acres and larger receiving the highest priority for assistance. The assistance priorities then drop in the following order: 2) 50-100 acres, 3) 20-50 acres, 4) 10-20 acres and 5) less than 10 acres. Although the larger ownership will receive the higher priority, all ownerships, regardless of size, will receive assistance.

Forest Resource Management Plans

The first step in providing assistance is development of a plan for orderly management of the forest. The plan provides a description of the land along with detailed recommendation for proper management techniques. During the past year, 430 forest landowners had plans prepared on 23,545 acres, a 20% increase over fiscal '81.

Timber Stand Improvement

One of the most important management actions by a landowner is to achieve improvement of timber

BUDGET

Park Service	7,850,770
Forest Service	3,860,172
TOTAL	11,710,842
Number of Staff	423
Seasonal Staff	525

during its growth to maturity. Improvement includes the removal of poor quality and over-crowded trees. The material removed can generally be sold as firewood, pulpwood or small sawtimber. In fiscal 1982, assistance was provided to landowners to help carry out timber stand improvement on 2,925 acres, doubling last year's accomplishment.

Reforestation

Another important management action is planting trees following a harvest or in open spaces such as old fields or strip mine areas. The largest reforestation effort is on the Eastern Shore where loblolly pine is used extensively in renewing harvested forest areas. White Pine is the second most planted species within the state. It is used mainly in the central and western regions of the state for small (average 1 acre) plantings. These plantings provide a multitude of benefits from wildlife habitat to watershed protection.

Seedlings for reforestation are grown at the state's Buckingham Forest Tree Nursery in Harmans and are sold at cost to the landowners. For the 1981-82 planting season, the nursery produced 3,584,000 seedlings used to reforest 4,560 acres of privately owned land within the state, 25% more than fiscal '81.

Roadside Trees

In addition to the production of seedlings for reforestation, the nursery also grows a variety of tree species for planting along public roadsides and on publicly owned property. These trees are sold at cost to individual homeowner associations and municipalities for the improvement of the natural ap-

pearance of our roads and streets. A total of 1,590 trees were sold in the spring of 1982.

Forest Conservation and Management Program (FCMA)

This program provides a tax incentive to landowners to encourage them to manage their forest lands. It is the fastest growing forestry program within the state. At the end of fiscal 1982, the program had a total of 480 owners under tax agreement on 47,300 acres.

To continue this incentive program, regulations were adopted late in 1982 to recoup the cost of program administration charges. These charges included a filing fee of fifty (\$50) dollars and a fee for compliance inspections of one hundred (\$100) dollars. The regulation also changes the inspection time from a two to five year period.

Target Accomplishment System

To assure that personnel time and effort is directed to those areas of greatest public benefit, a target accomplishment system was established during fiscal 1982. The system is based upon two organizational management principles, sound direction and employee involvement. Targets are established for each of the 19 private land projects within the service and are developed through the involvement of all service personnel and provide assurance that the major goals of the service are being accomplished. This system is the first of its kind within the Department.

Computer Technology

To improve management assistance to forest landowners, a timber inventory program was initiated in 1982. The program known as the Timber Inventory Management Information System (TIMPIS) provides the forester with a tool to project timber growth and value for the landowner. Evaluation of this program will continue through fiscal 1983 to determine if it is a practical tool in Maryland.

Forest Demonstration Areas

A three hundred and seventeen (317) tract of forest land was purchased in Harford County. The tract is to be used to demonstrate the many facets of forest land management and the values derived from management. The tract has been inventoried using TIMPIS and a management plan is being developed. The plan will call for a variety of forest management techniques from Timber Stand Improvement to leaving den trees for wildlife habitat.

Other areas being used for demonstration are the Cedarville and Doncaster Demonstration Forests in Charles County, Elk Neck State Forest in Cecil County, Seth Forest in Talbot County and the Wicomico Demonstration Forest in Wicomico County.

Demonstration forests show visitors the many values of forest lands and demonstrate to private landowners good forest management practices. They also provide an outdoor laboratory to research and test new techniques before their application on private lands.

Forest Resource Utilization

Forest resource utilization emphasizes increasing availability of wood products. This is accomplished through loss reductions in harvesting, sawing, and processing and in making full use of waste wood.

Our goal of making the most of the forest resource through improved utilization continues to be a challenge during these times of economic difficulty. The lack of residential construction and the general economic slowdown have hit the industry hard. Some mills have been able to rebuild or expand operations.

Fuelwood became important this year for two reasons: it is a fuel that many homeowners can cut themselves for a low capital expenditure, and, some who have lost jobs find a means of income. Project foresters make a significant contribution by keeping landowners,

who need forestry work done, in touch with operators who need a place to cut. Additionally, the Department successfully introduced legislation relieving landowners of normal liability if they allow individuals to cut firewood for personal use on their land free of charge.

The Maryland Residential Fuelwood Use Assessment was completed, indicating that about 750,000 cords of firewood was burned in Maryland homes during the winter of 1980-81. Use for 1981-82 was estimated to be just over 800,000 cords.

Industrial application of wood as a fuel has lagged behind residential use; one recommendation from the state funded feasibility study "Selected Application of Wood Energy in Maryland" was implemented. J.V. Wells, Inc. installed a wood fire heat exchange system that is so successful it has led to interest by other businesses on the Eastern Shore. As more units come into use more economical site preparation prior to reforestation should result.

A directory of secondary wood processors such as cabinet makers, furniture companies and boat builders was completed for distribution this fiscal year. Similar directories in other states have benefited users by locating new markets for their products.

Traditional programs of direct assistance through processing and recovery studies were supplemented with computer programs for economic analysis of equipment replacement or repair and other similar information. This capability will be expanded in the future to provide operators with assistance they cannot afford but which can be of significant benefit to the state's economy.

More than 1,700 contacts were made with the forest industry through utilization activities. The improved utilization of Maryland's forests this year equaled 362,000 cubic feet of wood products or the equivalent of 265 acres of Maryland forests that would have ended up as residue or by-products.

Forest Resource Planning

Forest Resource Planning emphasizes the assessment of the forest resource base. The assessment is used to provide direction to resource management and to determine the impacts of the loss of the forest resource base and means for reducing the loss, through planning. Assistance is provided to state, regional, and local planning agencies in the development and revision of their land use plans. This assistance helps reduce the loss of the forest land base.

The Maryland Resource Planning Act (RPA) process continued production of the draft forest resource plan. One of two projects utilizing LANDSAT Satellite data was completed and published in cooperation with NASA's Eastern Regional Remote Sensing Applications Center. This Worcester County project resulted in mapped and tabled data about hardwood, softwood and mixed forests as well as non-forest land uses. The second LANDSAT project, in cooperation with the Remote Sensing Systems Laboratory based in the University of Maryland's Civil Engineering Department, will map, by county, all of Maryland's forest land.

A joint resolution passed in the 1981 session of Maryland's General Assembly resulted in a 17 member Forest Land Task Force being appointed by the Governor. The Forest Resource program staffed the task force when chairperson, the Honorable Delegate Catherine I. Riley (D-Harford), split the membership into a forest land taxation subcommittee and a forest management practices subcommittee. The task force met five times during the year and provided recommendations to the Governor, legislative committees and this agency.

Legislative coordination was provided for this unit and a legislative package of 7 separate bills were drafted for the 1982 Session.

All but one of these were amendments to existing law. In addition at least 2 dozen bills were monitored through the session. Five

of the 7 bills originally drafted passed and ranged in content from increasing tree expert fees and combining forest and parks units into the Forest and Park Service as well as an enabling act creating a Maryland Conservation Corps. A fall legislative forestry tour was coordinated here and conducted by western region personnel for the House of Delegates Environmental Matters Committee and showed multiple forest resource management on both state and private land.

Forest Resource Protection

Resource protection's mission is reduction of loss from fire, insects, and disease. Reduction is obtained through continuing efforts in prevention, training and suppression.

Wildfire Protection

Wildfire protection is provided to 2,706,000 forested acres throughout the State and 994,000 acres of marshlands located mainly on the Eastern Shore.

Fire Prevention

Prevention is education and the enforcement of existing laws and regulations.

—School Programs—In 1982 more than 172 programs were presented to students in the 2nd, 3rd, and 4th grades.

—Law enforcement efforts were aimed at reducing debris burning and incendiary caused fires. Activities included:

—Training in investigative techniques for forestry personnel.

—Issuance of 1,089 burning permits to contractors and landowners.

—Inspection of 714 miles of railroad rights-of-way for fire hazards.

Fire Preparedness

The first phase of fire preparedness is planning. Each of the four forestry regions has plans for directing fire suppression efforts. These plans are analyzed annually and updated to meet current fire conditions.

Fire weather forecasting was the system of fire weather projection used in 1982. Using data provided by the U.S. Weather Bureau, daily weather conditions are provided to each of the eight dispatching centers in the State. The information is used to make daily fire danger projections for personnel and equipment providing effective fire suppression.

A program of equipment maintenance is carried out annually. The 140 specialized vehicles equipped for fire suppression are inspected bi-annually.

Fire Suppression

In 1982, forestry personnel suppressed 1,037 wildfires which burned more than 14,652 acres. The leading cause of fires were debris burning, children and incendiary.

Training in basic fire behavior and fire control methods was provided to Forest Service personnel and fire departments.

Again, Maryland served as host for the Middle Atlantic Forest Fire Compact States annual training session. Personnel from Maryland, West Virginia, Pennsylvania, Delaware and New Jersey attended.

Volunteer fire departments received Federal money through the Rural Community Fire Protection Program. A total of \$33,700 was distributed by the Forests and Parks to provide training and to purchase fire and safety equipment. The volunteers matched funds through their departmental budgets.

Insect and Disease Protection

Forestry personnel continued to assist the Department of Agriculture in insect and disease detection. The main effort this year was in the survey for gypsy moth. A total of 4,460 acres of forest land was defoliated by gypsy moth this year including 145 acres of state-owned land. Forestry personnel also assisted in surveys and evaluations of southern pine bark beetle on the Eastern Shore and oak wilt disease in Western Maryland.

Urban-Community

Urban forestry provides protection and care of trees growing within the rights-of-way of publicly owned roads within the state, technical assistance to improvement associations, developers and planners in the management of their trees and forests, and, consumer protection through the tree expert licensing law.

Urban forest planning assisted on 68 land development projects in Southern Maryland.

Roadside Tree Supervision

Another urban forestry duty is supervision of tree care work on public rights-of-way. Utility crews are supervised through a permit system. More than 1,000 permits were issued requiring 28,000 hours of personnel time for supervision. Funding is through direct charges to the utility under supervision. Coordination of efforts of all the industries and agencies maintaining vegetation along the public rights-of-way began in FY'82. The group is identifying the best management tools and techniques for roadside tree care. Incorporating these techniques into the daily operation is the next step.

Street Tree Inventories

Street tree maintenance in towns or cities is a necessary function of the city government. Forests and Parks assists in the inventory of these trees. The inventory records the number and location of street trees and specific recommendations for proper tree care. Inventories were completed for 9 communities during 1982.

Funding

A booklet entitled, "Local Forest Land, An Essential Community Element", was printed with the assistance of federal matching funds. The American Forestry Association and the Maryland Forests Association also contributed to the cost of this publication.

Tree Expert Licensing

Any individual or company providing tree care service for a fee must be licensed by the Department. During 1982, about 300 individuals were licensed as tree experts.

Roadside Plantings

Saplings are sold at production cost to assist residents in the beautification of their streets. These saplings are to be used for plantings within public rights-of-way or on publicly owned property. Approximately 1,700 trees were sold in 1982 for this purpose.

FOREST AND PARK MANAGEMENT PROGRAM

The Forest and Park Management Program administers and manages Maryland's state forests, parks, scenic preserves, historic monuments, and natural environment areas to preserve the natural resources, insure multiple use and sustained yield of forest resources and provide recreational opportunities throughout the state.

Program projects take place in all parts of Maryland. The program is comprised of 53 management projects, including four state forests, ten multi-use parks, fourteen general recreation parks, seven waterfront parks, six natural environment areas, ten historic or scenic sites, one roadside picnic area and one natural resources management area. Of the fifty-three projects, thirty-nine are in operation, while fourteen are either under development or acquisition. The program encompasses 198,000 acres of state land.

Forest and park improvements include roads, parking lots, overlooks, scenic vistas, utilities and facilities people associate with recreation including: campgrounds, picnic areas, playgrounds, trails and water related facilities. There are 104 miles of paved road and paved parking lots for 11,900 cars. Public buildings total more than 714 and include comfort stations, bathhouses, concessions, monuments, nature centers, museums, offices,

and visitor centers. The value of these fixed assets total more than 170 million dollars.

The Forest and Park Service provides 2,471 individual camping sites, and a number of sites for organized youth groups. There are 119 picnic areas and 82 playgrounds. Nature trails, hiking trails, cross-country ski trails, and off-road vehicle trails extend for over 450 miles. Twenty ponds and lakes cover 728 acres. Additionally, visitors enjoy the waters of the Atlantic Ocean, Chesapeake Bay and many rivers and streams. Boat launching ramps, boat docking slips and rental boats are available to the public throughout the state.

Concession Program

This program is comprised of six contract concessions and ten Maryland Forest and Park Service operations. Contract concessions include four snack bars, one boating facility, one campstore and a head boat operation. Revenue returned to the Service totals more than \$47,000 per year.

Our self-operated concessions have produced significant revenues over the year. Eight boating operations, four snack bars and four campstores generated \$567,877 in gross revenue this year.

Enforcement and Public Safety

Enforcement of Forest and Park rules and regulations serves a dual purpose: protection of the resources and protection of the visitor. During calendar year 1981, rangers issued 2,178 citations, 2,901 warnings and handled 2,456 incidents on the forests and parks.

All rangers in law enforcement positions requalified with the Service issued firearm.

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 1981 the following programs took place at these parks:

At Fort Frederick, one full-time ranger interpreter and three summer seasonal historians garrisoned the fort five days a week demonstrating a number of aspects of 18th century frontier garrison life. In addition, a group of volunteers in the parks (VIPs) served at the fort on many weekends. Major weekend programs involving large military units were held in May (Fort Frederick Rendezvous) in July and September (Governor's Invitational Firelock Match).

The Steppingstone Museum Foundation, a private non-profit organization, continued to operate at Susquehanna for the fourth year. Crafts demonstrations, special events and living history were featured. Elsewhere in Susquehanna State Park, the Rock Run Mill area, with several restored structures, was open to the public with living history demonstrations.

Gathland State Park cooperated with the town of Burkittsville for a large 2 day event commemorating the Civil War Battle of South Mountain in September.

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 September, craftspeople from all over the East Coast demonstrated their skills.

Point Lookout's history program continued to draw attention to the Civil War prison through exhibits in the park's visitor center. Besides the park's own roving interpreters, re-activated Civil War groups were on hand during special events to augment the program. The annual Confederate Memorial Service was held in June.

Nature Interpretation

Participation in interpretive programs increased in many parks. Interpretive programs and facilities served more than 250,000 people. Nearly one-fourth of park visitors visiting our parks participate in interpretive programs and activities.

Interpretive programs extend into the fall, spring and winter. New programs have been developed to reach communities near the parks. Programs were developed to provide assistance to novice backpackers, campers and hikers to help them to have a safer, more enjoyable time outdoors.

MARYLAND FOREST AND PARK TOTAL USE ATTENDANCE

Green Ridge State Forest	212,788
Potomac-Garrett State Forests	117,956
Savage River State Forest	19,712
Assateague State Park	308,747
Big Run State Park	19,610
Calvert Cliffs State Park	42,622
Cedarville Natural Resources Management Area	47,202
Cunningham Falls State Park	347,846
Dan's Mountain State Park	30,584
Deep Creek Lake State Park	108,530
Elk Neck State Park	233,322
Fort Frederick State Park	66,331
Gambrill State Park	162,813
Gathland State Park	37,202
Greenbrier State Park	153,107
Gunpowder Falls State Park	338,848
Herrington Manor State Park	66,292
Janes Island State Park	130,203
Jonas Green Picnic Area	61,234
Martinak State Park	78,101
Matapeake State Park	74,231
New Germany State Park	40,355
Patapsco Valley State Park	488,091
Patuxent River State Park	10,206
Pocomoke River State Park	148,562
Point Lookout State Park	194,783
Rocks State Park	168,261
Rocky Gap State Park	327,440
St. Mary's River State Park	6,857
Sandy Point State Park	440,266
Seneca Creek State Park	86,003
Severn Run Natural Environmental Area	16,283
Smallwood State Park	42,269
Soldiers Delight Natural Environmental Area	6,079
South Mountain Natural Environmental Area	27,429
Susquehanna State Park	182,798
Swallow Falls State Park	157,175
Tuckahoe State Park	56,000
Washington Monument State Park	127,340
Wye Oak State Park	67,355
TOTAL	5,250,833

NATURAL RESOURCES POLICE

A major reorganization was implemented on September 15, 1981 to provide a more effective and efficient service to the public.

The Inland and Marine Enforcement Divisions were brought together under one Director of Operations, reducing nine enforcement regions to five.

The Force now has two major units, General Direction and Field Operations. General Direction consists of Headquarters staff and Supportive Services, and Field Operations the five enforcement regions. The Captain in charge of each region is responsible for all enforcement activity within his region. Officers with the rank of Sergeant and below specialize in either inland or marine activities.

ASSISTANCE AND INFORMATION

There were 104,648 telephone calls for assistance or information with 30,718 calls received at officers' homes, 37,965 calls at the Regional Enforcement Offices, and 35,965 calls received at the Communications Center or the Annapolis Headquarters.

A total of 1,785 assists were recorded as follows:

Number	Type
234	Disabled boats
177	Disabled vehicles
38	Injured persons
433	Assist other agencies
100	Transportation
387	Boats towed to port
38	Boats escorted to port
143	Boats aground
23	Boats stuck in ice
23	Pumped sinking boats
4	Firefighting
165	Other

Assistance to other agencies included assisting the Anne Arundel County Police Department on an armed robbery complaint, the Charles County Sheriff's Office with a rape case, and the Maryland State Police with a hostage situation.

Life Saving and Rescue

Many acts performed by the Natural Resources Police Force result in saving life and property. Locating lost hunters, towing boats to safety, stopping unsafe practices, arresting intoxicated persons in public recreation areas are all examples of acts which are routinely performed, but often unnoticed and logged as routine duty.

There are occasions when an officer arrives at the scene after the fact, or just in time to prevent further harm. The following are examples:

- In January, 23 officers and six boats responded to the Air Florida 90 plane crash in the Potomac River in Washington, D.C. A total of 2,320 manhours were expended.

- In June, seven officers using three boats spent 43 manhours in the Pocomoke Swamp recovering two bodies from a small plane crash.

- In November, a woman was saved who fell from a MSP helicopter, after being pulled from her sinking vessel in the Chester River.

- In January, a small child overcome by monoxide fumes on an oyster tonging boat was saved by an officer.

- In February, on two occasions, five persons were rescued from sinking vessels caught in ice.

- In February, two officers risked their lives saving two men stranded on ice.

- In Western Maryland, while off duty, an officer saved the life of a small child by administering CPR.

- In May, in Somerset County four people and a vehicle were removed from a burning building.

Enforcement and Protection

A series of assaults and destruction of State and personal property marred this year's enforcement effort:

- In August, an Officer was assaulted by a citizen.

- In September, in Montgomery and Dorchester Counties, two Natural Resources Police vehicles were vandalized.

- In November, a Natural Resources Police vehicle was side-swiped by a vehicle driven by a jacklighter.

- Two Officers were shot at by jacklighters. They were arrested later and charged with assault with a deadly weapon.

- A Natural Resources Police vehicle was shot while parked in the Officer's yard.

- In December, the front window of an Officer's residence was shot out, the bullet narrowly missed the Officer's wife and lodged in the kitchen wall.

- In January, in Prince George's County, two Natural Resources Police vehicles were vandalized while the Officers were on foot patrol.

- Officers working on an illegal fish case on the Potomac River were threatened with bodily harm.

- In June, an Officer was assaulted while off duty.

There were 4,166 complaints recorded from the public. A total of 6,835 citations and 2,126 warnings were issued for violations of the Natural Resources Article and 135 warrants were served.

Because of an outbreak of rabies in that region, all Officers and a Police Communications Operator assigned to the Western Region were required to be inoculated against rabies.

Routine patrols served as a valuable deterrent to violations through the high visibility of officers and also afforded them opportunity to inspect 32,388 fishermen, 22,079 hunters, 497 trappers, 119,779 boats, 15,129 seafood establishments, 636 vehicles and 531 permit holders. In addition, officers responded to 130 trespass complaints.

Although primary efforts are the preservation and protection of Maryland's natural resources, circumstances sometimes require officers to respond to violations of the Criminal Code. The following reflects some of those responses.

July 1981

- A man was arrested for operating under the influence, failure to allow boarding and carrying a concealed weapon.

- Two juveniles from Anne Arundel County were arrested for unauthorized use of a 30-foot cruiser.

- Assisted St. Mary's County Sheriff's Office, Maryland State Police, Virginia Police Authorities and the Federal Bureau of Investigation in a theft ring investigation.

- Recovered 22 stolen boats and 21 stolen motors.

August 1981

- Arrested two juveniles for theft.

September 1981

- Four seizures of controlled dangerous substance.

- Recovered three stolen boats.

October 1981

- Two arrests for larceny of equipment at the Annapolis Boat Show

November 1981

- Apprehended a Federal fugitive in Annapolis and recovered \$37,000.

- Charged seven subjects with writing bad checks to the Department of Natural Resources for oyster licenses.

December 1981

- Arrested four persons in Western Maryland for dumping hazardous waste material.

- Talbot County juvenile charged with breaking and entering and malicious destruction of property.

- Two persons arrested in Worcester County for stealing a vehicle in Pennsylvania.

February 1982

- Recovered one stolen vehicle in Kent County.

- Arrested three men in Anne Arundel County for stolen motors.

March 1982

- Five subjects arrested at Loch Raven Watershed for possession of marijuana and paraphernalia.

- Two endangered species mounts in Annapolis seized.

- Two men arrested for removing trees from State Parks.

May 1982

- 58 manhours spent closing access to the C & D Canal following spill of a hazardous chemical.

- Prince George's County stakeout resulted in a civilian being arrested for impersonating a police officer and for a handgun violation.

Undercover Operations

- Body of homicide victim recovered in Washington County

- A conviction and \$8,850 fine for illegal sale and transportation of 67 Canada geese.

- Thirty hours of surveillance near Sandy Point resulted in seven arrests for clamming violations.

- Undercover work near Rockville resulted in an arrest for 40 counts of possession of oversized striped bass (rockfish).

- Surveillance teams accompanied by the Departmental aircraft curtailed crab pot thefts in Southern Maryland by making six arrests on three occasions.

- Six Natural Resources Police were instrumental in apprehending and convicting 20 suspects on felony theft charges.

- An Officer utilized his own boat and vehicle for surveillance of a game breeder and made a case for trapping waterfowl. Thirty-six scaup were seized.

- Enforcement efforts in the Potomac River resulted in 70 arrests for illegal setting of gill nets and possession of oversized rockfish and seizure of approximately 6,000 yards of illegal gill net.

- Surveillance on the Upper Eastern Shore resulted in 12 arrests for hunting waterfowl with an unplugged shotgun.

- A 13.5 hour stakeout in Cecil County resulted in one arrest for larceny of eel pots.

Boating Accident Investigation

There were 175 accidents reported involving 239 boats, 69 injuries, 19 deaths and \$500,951 in property damage.

One conviction for manslaughter by boat in Kent County in April 1982. A high speed runabout struck an anchored sailboat, a female passenger in the runabout was thrown overboard and drowned.

Investigation

Two hundred eight boats, 122 motors and 185 miscellaneous articles were reported stolen for a value of \$809,107.54 and 110 boats, 46 motors and 40 miscellaneous articles were recovered. Total property value recovered was \$571,651.

Aviation

The Aviation Section operates a Cessna 185 on amphibious floats. There are two full-time pilots and the State Boat Accident Investigator is also a qualified pilot who serves as a back-up pilot.

The plane flew a total of 470 hours and recorded 410 hours as enforcement patrol and aided in making 86 arrests for various conservation violations.

In October, 1981, the plane was flying over Tilghman Island and a large field of marijuana was discovered, which resulted in five arrests.

The home-base for the aircraft was changed from Baltimore County to the Easton Airport in Talbot County.

Selective Enforcement Detachment

Three officers are temporarily assigned to the Water Resources Administration to assist with enforcement of regulations. An additional two officers are members of the Hazardous Waste Strike Force, an antipollution enforcement team operating within the Office of Environmental Programs, Department of Health and Mental Hygiene.

Maintenance and Supply

Responsibility for maintaining communications for the Inland Pa-

trol units was transferred from the Hollifield Shop at Patapsco State Park, to the Electronics Section at Matapeake.

Steel patrol boats in the fleet were recommended for replacement. Nine of the steel units were sold at public auction in the Spring of 1982, along with two 27-foot Chris Crafts and the patrol boat Honga River. Three more units are out of service and will be sold at the next auction.

There were 50 patrol vessels hauled in for maintenance at Matapeake. Routine annual maintenance, which consists of painting the bottoms, painting or waxing the hull and superstructure, and preventive maintenance to engines and running gear was performed on 24 vessels.

Emergency repair of hulls due to ice damage was performed on two vessels. Major engine work consisting of rebuilding or replacement of engines was required for nine units.

Fifteen vessels were hauled in for repairs, including replacement of bent wheels and/or shafts, rudder repair, removal of crab pots from wheels and cleaning barnacles from shafts and wheels.

A contract was awarded to build three 32-foot fiberglass patrol boats. The boats will be custom built by Chesapeake Marine Industries of Trappe, Maryland. They are Chesapeake Bay Workboat designs and will be powered by two 350 C.I.D. Crusader engines. Construction and design will be similar to the two 42-foot vessels received in FY 81. Delivery is scheduled for Fall 1982.

A study examining options available in replacing patrol boats is underway.

Hovercraft Systems, Inc. has developed a craft for law enforcement, search and rescue, and ice-breaking, and, has solicited the Department's expertise in evaluating its performance. Delivery is expected the end of 1982.

The Supply Section (operating and purchasing) processed 3,877 reports.

A vehicle and boat refueling system was completed at Matapeake

to ensure an adequate amount of fuel for emergency operations. All maintenance vehicles make full use of the system, as well as, some field operations vehicles.

Training

The 32nd Basic Recruit Class of the Natural Resources Police Academy had 16 recruits in attendance, five from the Delaware Natural Resources Police Force. A total of 15,600 manhours were spent on recruit training.

There were 21 reported hunting accidents. Of these, six were self-inflicted. This was a 61% decrease in accidents from Fiscal Year 1981. For the first time in the history of the Program, there were no fatalities.

Nine formal Instructor Workshops were given to the 278 active instructor force.

A nine-member Advisory Board was selected to assist the Program in developing plans for future projects and advise on Hunter Education matters.

Development of a Comprehensive Plan began with the completion of a Strategic Plan in cooperation with the Maryland Wildlife Administration and the U.S. Fish and Wildlife Service.

Boating Safety Education

Boating Safety Education began the year with the appointment of a new Boating Safety Officer to replace the officer who retired on June 30, 1981.

A new course was developed and is now available through formal class presentation and home study.

An instructor workshop for teachers was set up to enhance the presentations in the public school systems. The televised portion of the program has been approved by the Board of Education for use in public schools.

A total of 6,258 courses were sent out and 2,237 respondents were certified.

In-service training for experienced officers totalled 5,826 hours. Firearms training accounted for 1,176 hours and the remaining 4,650 hours were used to certify 186 sworn officers in "First Responder Medical Training".

A grant was received from the Department of Transportation to upgrade Basic Life Support/Emergency Medical Service. This will be used to train the officers to become certified Emergency Medical Technicians.

Additional In-service training was conducted by the regional Captains on a monthly basis during their regional meetings.

Nine of the ten Police Cadets assigned under the direction of the Academy entered the 32nd Basic Recruit Class. In January, 1982, 12 new Cadets were hired for a total of 13 Cadets.

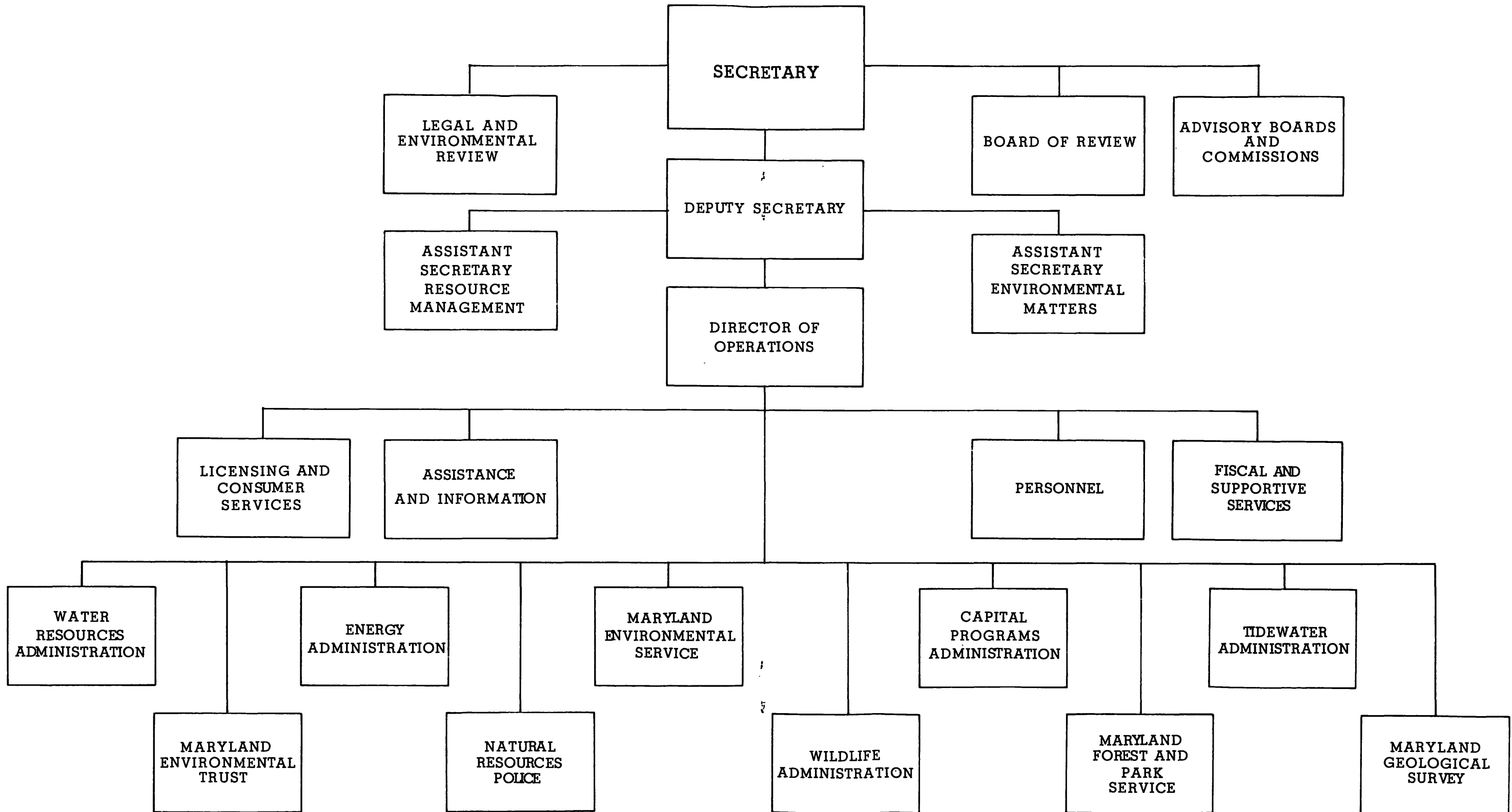
Public Relations and Education

The Natural Resources Police participated in 690 public relations activities, exclusive of formal classes in Hunter and Boating Education. Lectures and demonstrations were given to various sports groups, clubs, schools and other civic organizations. In addition to this, special exhibits were manned during National Police Week, National Hunting and Fishing Day, and during the many boat shows.

HUNTER EDUCATION PROGRAM

The Hunter Education Program provided a minimum of seven hours of formal training to novice hunters prior to purchase of their first license. There were 224 formal classes taught and 8,309 people were certified.

CHART OF ORGANIZATION FISCAL YEAR 1982



WATER RESOURCES ADMINISTRATION

Budget \$3,101,668
Number of Staff 115

The Water Resources Administration is responsible for the protection, management and development of Maryland's water resources through the administration of the Watershed Management Program, the Resource Management Program and the Resource Protection and Oil Spill Control Program.

GENERAL DIRECTION

This program is responsible for the overall direction, supervision and coordination of the policies and operations of the Administration. Coordination of public notices and hearings and a public information office are also functions of this program.

In FY 82 the Administration sponsored a series of workshops State-wide to assist local governments, Soil Conservation District personnel and others to better understand the WRA permit, license and approval activities that affect local government decisions. Approximately 280 persons attended these workshops.

The Administration has also been charged with the development of a stormwater management program. The law, Chapter 682 of the Acts of 1982, requires WRA to adopt and implement regulations establishing criteria and procedures for stormwater management in Maryland. This law also requires local governments to adopt ordinances and implement stormwater management programs consistent with the statewide criteria and procedures. The staff positions are being filled and the process for establishing a Stormwater Management Program is underway.

RESOURCE PROTECTION PROGRAM

The divisions in this program are: Enforcement, Oil Control and Laboratory Services.

Enforcement Division

Enforcement is responsible for the inspection and enforcement activities of the Water Resources Administration authorized under the Natural Resources Article Titles 8 and 9 and the regulations adopted, including oil control activities. Enforcement actions, either administrative or legal, are based on the nature, extent and impact of violations. Primary emphasis is given to direct "in the field" corrective action. Twelve regional inspectors monitor an average of 400 active permits each. Positions for six additional inspectors were authorized for FY 83.

SUMMARY OF ADMINISTRATIVE ACTIONS

	<u>Total</u>
Complaints and Orders issued for violations of Maryland law and regulations	330
Supplemental Orders issued for follow-up actions	47
Inspections for permitted activities	8,636
Complaints received and follow-up actions	642
Cases referred to the Attorney General for action	5
Citations/Criminal Summons Issued/ Served	44
Other Process Services	47
Total Fines Paid	\$2,125*

*This figure reflects the fines and penalties assessed for violations of the Natural Resources Laws administered by the Water Resources Administration during FY 82.

In FY 82 Enforcement personnel focused attention on Surface Mine Permit holders to assure that they were meeting permit conditions. Bond forfeiture was initiated in five cases; one case has been completed and a \$54,000 bond for-

feited. The monies are used to reclaim the affected site.

Efforts have also been made to expedite the administrative procedures in handling all violations to assure swifter compliance and corrective action as necessary.

The Enforcement Division and Natural Resources Police detachment have continued to monitor the Annapolis Anchorage for violations of the Oil Pollution Laws.

Oil Control Division

The Oil Control Division issues Oil Operations Permits, Oil Vehicle Operator's Certificates and Oil Terminal Facility Licenses and carries out follow-up field enforcement work related to these activities. The Division is supported by the Maryland Oil Disaster, Containment, Clean-up and Contingency Fund. This special fund is maintained by license fees charged for oil storage facilities over 3,000 barrels.

The Division has developed and obtained equipment to respond to, contain and clean up oil spills on inland waters and open waters of the Chesapeake Bay and its tributaries.

A 24-hour radio watch is maintained to respond to oil spill emergencies.

Permits

Oil Operations Permits Issued	196
Driver Certifications Issued	1,231
Oil Terminal Licenses Issued	192

Spill Response

Spills Responded to by WRA	280
Total Spills Reported	2,071
WRA Response Team Assisted Cleanups	122

The Water Resources Administration stores spill equipment and absorbent materials Statewide for use by local fire departments and

other agencies to combat minor oil spills. In many cases, local officials are able to handle small spills.

The Oil Spill Control Division

Provides training and instruction statewide to help industry and others prevent and control oil spills. Twenty-five presentations were made to volunteer firemen, high school students, State Highway personnel and petroleum tanker truck transfer personnel.

The Ad Hoc Committee on oil spills in Open Water met seven times to discuss and advise the Administration on Federal Superfund Legislation, new equipment purchases and effective oil spill clean-up and restoration techniques.

Laboratory Services Division

This division conducts the bacteriological and chemical analyses necessary to support a variety of Department of Health and Mental Hygiene and Department of Natural Resources programs. Laboratory facilities are located in Western Maryland and at the Tawes State Office Building in Annapolis. The Annapolis Laboratory performed the following analyses:

Maryland Environmental Service—Sludge	755
Maryland Environmental Service—Operations & Maintenance	8,738
Maryland Wildlife Administration—SOS Program	4,173
Maryland Tidewater Administration	3,226
Water Resources Administration	261
Office of Environmental Programs—Enforcement, Water Quality and Industrial Waste	9,567

The Western Maryland Laboratory performed a total of 13,662 analyses for the Department of Natural Resources and the Department of Health and Mental Hygiene.

By July 1, 1982, laboratory equipment and personnel that were transferred to the Department of Health and Mental Hygiene by Executive Order will no longer be located at the DNR facilities. The

remaining laboratory personnel will continue to meet the variety of laboratory needs for DNR.

RESOURCE MANAGEMENT PROGRAM

This program includes the Wetlands Division, Surface Mining Division and Water Supply Division.

Wetlands Division

The Wetlands Division issues wetland permits and approvals for the regulation of dredging, filling and related activities in private wetlands; makes written recommendations to the Board of Public Works on the issuance of wetland licenses for work in State wetlands, including storm drain systems out-letting into tidal waters; administers the monitoring of overboard dredge spoil disposal projects; and provides comment on various matters affecting tidal and non-tidal wetlands throughout the State. The permit and licensing procedures for these activities involve site inspections, technical evaluations, interagency coordination and public hearings. In addition, the Division provides advisory services to prospective applicants on modifications or alternatives to proposed works that would minimize adverse effects on the environment.

The Wetlands Division is continuing a developmental and oversight role in the preparation and conduct of integrated studies to assess the environmental impacts of construction and operation of the Hart-Miller Islands Containment Facility. Environmental monitoring began August 1981.

The Division, in coordination with the Maryland Wildlife Administration, published "Regulations of Waterfowl Management Practices in Maryland—Guidance for Project Sponsors."

Projects Processed

License Recommendations to Board of Public Works	413
DNR Permits	18
DNR Notification Approvals	89

DNR Letters of No Objection/No Jurisdiction	211
Federal Project/Other Reviews and Evaluations	140
Advisory Services	289

Surface Mining Division

The Surface Mining Division is responsible for the prevention and elimination of hazards to public safety from non-fuel surface mining activities, assuring environmental safeguards in the operation of non-fuel surface mines and the reclamation of land areas affected by non-fuel surface mining. The Division issues licenses and permits and establishes permit conditions, reviews and evaluates mining and reclamation plans, and makes an annual review of each permit. Funds received from license fees, permit fees and other sources are held in the Surface Mine Land Reclamation Fund to be used for reclamation of abandoned non-fuel surface mines.

Site Inspections

Original Permit Applications	29
Permit Modifications	31
Permit Renewals	28
Assistance to Enforcement Division	61
Other	52

Applications

Permits—Original	30
Transfer	9
Modification	29
Renewal	30
Licenses—Original	20
Renewal	185

Since funds available for reclamation of abandoned mines are limited, the Surface Mining Division has developed a priority list of abandoned surface mine sites based on the need for reclamation and potential for safety problems. The Phelps property in Prince George's County in the Patuxent River Watershed was selected as a demonstration reclamation project. Plans for reclamation are currently being developed by the Division and the Maryland National Capital Parks and Planning Commission.

The Division worked closely with enforcement personnel of the Resources Protection Program to assure surface mine operator compliance with permit conditions.

The Division is developing rules and regulations for implementation of the Surface Mine Law.

Water Supply Division

The Water Supply Division directs the development, conservation and use of the State's water supplies to meet present and future needs of municipal, industrial, commercial, agricultural and domestic water users, while protecting surface and groundwater resources.

The Water Appropriation Permits Section and the Water Supply Planning Section make up this Division.

WATER APPROPRIATION PERMITS SECTION

The Water Appropriation Permits Section issues permits for appropriation and use of waters of the State. Permit evaluations are conducted to assure that adequate quantities of water are available for requested use, to protect in-stream values during low river flow and groundwater supplies and to lessen potential conflicts among water users. The section also provides technical hydrogeologic and engineering assistance to individuals and jurisdictions on the availability and efficient development of local ground and surface water supplies.

Applications Received	543
Applications Issued	536
Permits Modified	66
Appropriation records on file	8,415
Site Inspections	136
Hearings	3
Clearinghouse Project reviews	12
Water and Sewer Plan reviews	43
Refuse Disposal Site reviews	30

WATER SUPPLY PLANNING SECTION

The Water Supply Planning Section's activities include development of comprehensive water supply management plans; Statewide

water conservation and water shortage planning; multi-agency and interstate coordination of water supply planning activities; surveys of water supply and demand; review of county water and sewage plans, landfill siting plans and Clearinghouse projects; and quantification of low-flow characteristics and aquifer modeling. Major accomplishments of FY 82 include:

- Significant achievements in regional water supply management were negotiated for the Metropolitan Washington area with the Commonwealth of Virginia, the U.S. Army Corps of Engineers, the District of Columbia and local water supply utilities. These include the purchase of the initial water supply storage and future storage in the Bloomington Lake; cost-sharing of construction of the proposed Little Seneca Reservoir in Montgomery County; cost-sharing of operation and maintenance of the Savage Reservoir; regional coordination of water supply operations; and modifications to the Potomac Low Flow Agreement.

- The first comprehensive Agricultural Irrigation Survey of agricultural water use was initiated. The University of Maryland, Agricultural Extension Service, is conducting the field work.

- Drafted a joint agreement with the State of Delaware to manage common groundwater resources.

- Negotiated an agreement with the U.S. Geological Survey and the Maryland Geological Survey that will improve the computer permit and water use information system for input to the National Water Use Data System and for water planning and permitting activities.

- Developed a strategy for monitoring drought occurrence and providing assistance during water shortage emergencies.

- Convened a committee of State and Federal officials to advise WRA on Potomac River reservoir management, completing the third recommendation of the Potomac River Environmental Flow-by Study. The following reports were pub-

lished by the Division:

- 1979 Maryland Water Use Report
- Access and Allocation of Geothermal Resources in Maryland.
- The Status of the Quantity and Quality of Groundwater in Maryland.
- The Quantity and Natural Quality of Groundwater in Maryland was published for public distribution.
- In addition, well data processed from 1945 to 1980 was made available on microfiche for general use.

WATERSHED MANAGEMENT PROGRAM

The divisions in this program are Flood Management, Watershed Permits, Erosion and Sediment Control, and Dam Safety.

Flood Management Division

The Flood Management Division administers the Flood Hazard Management Act of 1976, which includes the Flood Management Grant Program, technical studies of watersheds and technical assistance to local governments. The Division also coordinates the National Flood Insurance Program for the State and the implementation of the Federal State Assistance Program with the Federal Emergency Management Agency.

Flood management studies underway in FY 82 included: Hall Creek, Calvert County; Owens Creek and Hunting Creek, Frederick County; Cabin Branch, Anne Arundel County; Mattawoman Creek, Charles and Prince George's Counties; Middle Patuxent River, Howard County; and, Beaverdam Creek, Wicomico County.

Flood Insurance Contractual Studies in progress during FY 82 include the following counties: Dorchester, Cecil, Somerset, Anne Arundel, Wicomico, Talbot and Queen Anne's.

The State Assistance Program, funded by the Federal Emergency Management Agency sponsored an Industrial Flood Preparedness Seminar for members of the indus-

trial community and local, state and federal agency personnel from a multi-state region. A report, "An Assessment of Flood Management Activities in Maryland" was published.

Flood management plans were approved for eleven watersheds. They include Gwynns Falls, Jones Falls, Western Branch, Tinkers Creek, Patapsco River in Anne Arundel County, Seneca Creek, Muddy Branch, Rock Creek, Bean Run, Herbert Run and Beaverdam Run.

Regulations for the Flood Management Grant Program were promulgated.

Criteria for ranking capital projects were developed and a proposed priority list for capital projects was distributed to local governments. A total of \$2,986,200 was granted for various projects in FY 82.

The Board of Public Works gave permission to negotiate for a flood management study of the Gunpowder Watershed with Baltimore County.

The Division served as technical advisor to the Charles County Stormwater Management Task Force, the Anne Arundel County Stormwater Management Task Force, and the Regional Planning Council Flood and Stormwater Management Committee.

Watershed Permits Division

The Watershed Permits Division reviews permit applications for a variety of projects that affect non-tidal streams and floodplains. The Division conducts site inspections and technical evaluations of proposed projects for permit decisions. In addition, advisory services are provided to prospective applicants on measures and alternatives that will minimize a project's adverse effects on the environment. The Division project reviews for FY 82 are as follows:

Type of Project	Requests Received	Number Approved
Maintenance and Repairs	240	240
Temporary Construction	138	117

State/Federal Erosion & Sediment Control	Reviews	331	122
Waterway Construction	216	197	
Waterway Obstruction (Dams)	3	7	
Small Ponds	34	28	

Erosion and Sediment Control Division

The Erosion and Sediment Control Division administers the State-wide Erosion and Sediment Control Program, reviews and evaluates local grading and sediment control programs, and conducts the "Responsible Personnel" Training Program.

The statewide review and evaluation seeks to assure that the local jurisdiction's grading and sediment control programs adequately prevent sediment problems. The "Responsible Personnel" training program was designed to promote an understanding of the benefits of clean water and to offer training to construction industry field personnel and local government agencies. Participation in the program enables personnel to fulfill State requirements for certification in erosion and sediment control techniques. To date, 115 classes have provided training for 2,732 persons.

The Erosion and Sediment Control Division, the State Soil Conservation Committee and the Soil Conservation Service are revising the "Standards and Specifications for Soil Erosion and Sediment Control in Developing Areas" which serves as the official guide for erosion and sediment control principles, methods and practices.

The Division hosted a multi-state Erosion and Sediment Control Conference. The Grading and Sediment Control Regulations, COMAR 08.05.01 are in the process of update and revision.

Dam Safety Division

The Dam Safety Division administers the State Safe Dams and Inspection Programs.

The FY 82 investigations include:

- Danger Reach Analyses have been completed for Baltimore City's Druid, Ashburton and Peck's Branch Dams; WSSC's Brighton and Rocky Gorge Dams; Johnson's Pond; and the Clinton, Emmitsburg, Warner Gap Hollow, and Rocky Gap Dams.

- Monitoring wells have been installed at Blairs Valley, Greenbrier and Rocky Gap Dams.

- Operation and Maintenance Inspections have been conducted at Piney Run, Wilde Lake, Lake Kit-tamagundi, Clinton Dam, Deer Creek 1, 2A, 3 Dams, Cranberry Branch, Grant View Farms, Priest-ford Hills, Pikesville Reservoir, County Home Farm Pond, Campus Hills Pond, Montrose Farm Pond, Meadow Lake, Pinehurst, and Haul Road Dams. Site visits were also conducted at Wheaton Branch; Lake Nirvana; Seneca Dam; Churchill Town Sector Dam; Inspiration Lake; Wheaton Regional Park; North Creek; Allen Pond; Heritage Harbor Site 1; and, Lake Placid.

- Spillway Adequacy Studies have been completed for Wheaton Storm Water Management Pond; Greenbelt Dam; Cash Creek; Mason Dixon Dam; Meadow Run; Redington Lake; Lake Louise; County Home Farm Pond; Octoraro Lakes Dam; and, Herrington Creek Dam.

The Dam Safety Division initiated meetings with the Maryland Emergency Management and Civil Defense Agency to develop emergency warning systems. During FY 82, Emergency Warning Systems were developed for dams on which danger reach analyses have been completed except for Johnson's Pond. The Division also provided drilling, survey and computer analysis services for a variety of DNR and WRA projects and a demonstration project for the University of Maryland.

MARYLAND ENVIRONMENTAL SERVICE

BUDGET \$3,866,451
Total Staff 275

The Maryland Environmental Service (MES) is a self-supporting public utility. Its major operations are energy and resource recovery, sludge composting and the management of water and wastewater treatment facilities. These projects are managed through cooperative agreements with governments and private industry.

Created by the Maryland General Assembly in 1970, the Service operates as a state agency and a non-profit corporation. This unique dual status enables MES to pursue innovative technologies in the solution of waste management problems. Over the past 12 years MES has become an internationally recognized leader in such environmental, economic and socially complex areas as managing sewage sludge; converting wastes into energy through the production and marketing of refuse derived fuel, regional operation of multiple water and sewerage facilities, and disposal of hazardous wastes.

A recent report prepared by the Conference of State Sanitary Engineers for the U.S. Environmental Protection Agency concluded with the following commendation:

"The Maryland Environmental Service is the epitome of a successful state agency. It has strong state support, yet little or no interference politically . . . MES also is blessed with strong, professional management. If a state were looking for a role model, MES is a good example of how to establish and operate an independent environmental service agency."

Financially, MES is self-supporting. Accounts include budgeted state as well as corporate funds. While MES cannot make a profit nor sustain a loss, it does charge corporate and government clients a fee for services based upon actual costs. State general funds

represent nine percent of the MES total annual revenue. These funds pay the costs of operating state-owned water and wastewater facilities and provide a limited planning and technical services program for local governments and other State agencies. Separate audits of MES state, non-state and corporate accounts are provided annually.

The corporate affairs are managed by a three-member board appointed by the Secretary of the Department of Natural Resources with the approval of the Governor. In FY '82 the MES staff included 139 Merit System employees and a contractual payroll that ranged from 94 to 144 employees. MES contractual employees may now become members of the State Pension System as a result of legislation enacted by the 1982 General Assembly.

GENERAL DIRECTION

This Program includes the MES Board of Directors, the administrative, personnel, and legal sections. It establishes policy, provides management and direction, legal, personnel, public affairs, contract administration, and related services to all programs.

A strategic planning workshop was held in February. A resulting task force is preparing recommendations for future development.

FINANCE

The Finance program provides fiscal services for all State, non-State and corporate activities, including fleet management, purchasing, payroll and budget control. Finance also manages corporate borrowing and repayment.

ENGINEERING SERVICES

Engineering manages all phases of project design and construction

including such projects as the upgrading and expansion of the Baltimore County Resource Recovery Facility (which when completed, will produce Refuse Derived Fuel for sale to the Baltimore Gas and Electric Company); sewage sludge composting and land containment projects for the Washington Suburban Sanitary Commission (WSSC) in Montgomery and Prince George's Counties, and design and construction to expand the Hawkins Point Hazardous Waste Management Facility in Baltimore. During FY '82 the Engineering Program operated a project for the containment of more than a hundred thousand tons of chrome ore tailings at the Hawkins Point Site 2 under a contractual agreement with the Allied Corporation.

Hazardous Wastes

In late 1981 a decision was made to expand the Hawkins Point Hazardous Waste Management Facility. The entire Hawkins Point property was evaluated for its expansion potential. Further studies focused on solving existing problems with Site 1, a closed chrome tailings fill. Engineering design, environmental assessments and a business management plan preceded an accelerated construction effort to bring a hazardous waste containment facility into operation quickly. Permit applications were made to the City of Baltimore and the Department of Health and Mental Hygiene. A vigorous public information program, strongly supported by the Governor's office was initiated with the Hawkins Point Community and the surrounding area.

The Hawkins Point Hazardous Waste Management Facility is expected to be operational in the Fall of 1982. It will handle inorganic solid wastes generated by Maryland industries and will be operated by MES. This project has in-

fluenced the siting of a Baltimore City sanitary landfill at Hawkins Point and the possible relocation of a privately operated hazardous waste treatment facility there.

Sludge Composting

The Dickerson Composting Facility in Montgomery County receives a daily average of 400 tons of undigested sludge from the Blue Plains Wastewater Treatment Plant in the District of Columbia. During FY 1982, 132,800 tons of sludge were composted at this site. The Western Branch Composting Facility in Prince George's County received digested and undigested sludge from the Blue Plains, Piscataway, and Western Branch Wastewater Treatment Plants. During FY 1982, 58,600 tons of sludge were composted at Western Branch. Sludge deliveries to Western Branch were suspended in September, 1981 to allow proper completion of facility construction. All elements of site construction were completed in November, 1981. The facility resumed operation in January, 1982, but sludge deliveries were terminated in April, 1982, at the direction of the Prince George's County Administration and WSSC. MES is now working with Prince George's County and WSSC in managing the soil injection program which has replaced composting as the County's principal method of sludge management.

Compost Marketing

An advertising campaign to increase public awareness of the availability and acceptability of compost was undertaken in the summer of 1981. Marketed under the trade name *ComPro*, approximately 48,000 cubic yards of compost were sold during this fiscal period. In addition to direct sales to bulk users, the Service has a network of 40 dealers who market the product through retail outlets. Other cooperative projects with local government were begun to demonstrate the use of compost. These included working with Anne Arundel County in the restoration of soils

on a completed cell at the Millersville landfill, and the use of compost to grow hybrid poplar trees at city wastewater treatment facilities in Baltimore and Cambridge.

Restoration of Sludge Entrenchment Sites

Restoration projects have been undertaken for sludge entrenchment sites that are approaching the end of a required five-year groundwater monitoring period. These projects include the physical rehabilitation of disturbed land, an evaluation of the stability of the entrenched sludge and a demonstration of agricultural reuse of the sites through trial cropping. During FY 1982 restoration work was commenced on five sites in Prince George's and Montgomery Counties. This work included the planting of over 6,000 fast-growing hybrid poplar trees on 4 acres, using *ComPro* as a soil conditioner. Another 150 acres were planted in corn to evaluate the potential for future food crop production.

Other Engineering Services

The Engineering Services group has directed design work for a 1.23 mgd capacity wastewater treatment facility for the Maryland Correctional Institution in Hagerstown, with construction beginning in September of 1982. In April of 1982, the interim headworks construction for flow leveling was completed at this facility. Wastewater treatment facility studies were also completed for Elk Neck State Park, Greenbrier State Park and the Southern Correctional Camp.

OPERATIONS AND MAINTENANCE

At the close of FY 1982 the Operations and Maintenance program was providing trained and licensed personnel on a 24-hr basis to operate 32 water supply plants and 61 wastewater treatment plants located throughout the State. Among these are facilities of such diversity and ownership as the Interstate 70 Highway rest areas, the Joppa-

towne water and wastewater plants and the sanitary wastewater treatment plant at Baltimore Gas and Electric Company's Calvert Cliffs Nuclear Power Generating Station. New clients added during FY 82 include the Giant Food Processing Plant at Jessup, the Town of Greensboro, and Wildworld Entertainment Park in Prince George's County.

Many facilities were improved. Some of the improvements were performed by MES personnel, some by contractors. For example, a \$22,000 modification to the Woodstock Treatment Plant, new flow meters at Bowie, Springfield and Cheltenham and a new aerator at Crownsville were all installed by MES personnel (at considerable savings to the user/clients and the State.)

Dechlorination

Presently, dechlorination is provided at 51 MES-operated facilities. Examination of alternative methods is underway for use of non-toxic disinfection methods, such as ultraviolet, to eliminate all chemical contamination in wastewater discharge.

Hart-Miller Islands

At Hart and Miller Islands, the Maryland Port Administration is building a diked disposal area for containment of dredge spoil resulting from the planned deepening of Baltimore channels. MES has a full-time inspector on site during the construction phase and will operate the facility when it is completed.

TECHNICAL SERVICES

This group provides the technical, planning and related research services needed by MES to undertake its varied water supply, wastewater treatment and solid waste disposal projects. It also provides a limited planning and technical services program for local governments and other State agencies.

Hazardous Waste Disposal Siting

As required by law, MES com-

pleted a Statewide evaluation of potential sites for disposal of hazardous waste in secure landfills. By mid-year a site had been selected at Hawkins Point in Baltimore City.

College Park

MES has joined with Prince George's County, and the University of Maryland in the development of a waste-to-energy project that will utilize 800 tons of municipal solid waste per day to produce 200,000 pounds per hour of steam for the University. Approval of \$500,000 from the Water Quality Loan Act of 1968 has been granted by the State Board of Public Works and Consultant selection process has begun. These funds will be used by MES to provide engineering and economic feasibility studies.

Mid-Shore Resource Recovery Project

In cooperation with Caroline, Dorchester, Queen Anne's and Talbot Counties and Sussex County, Delaware, MES has prepared a plan to generate energy from solid waste in one of the States rural areas. The phase I feasibility study identified two market locations for the project with a third possibility if a large ethanol distillery is built. This study is a guide that can serve as a model for other rural areas. A comprehensive report on technology, waste stream, economics, and institutional factors of the project is being published early in FY 1983.

Recycling Activities

MES has handled over 700 phone calls on the toll-free line installed in October 1981 with funds from the Maryland Energy Office. This service provides citizens with information on where they can take their used oil and other materials such as paper, aluminum and glass for recycling. In addition, a slide show has been developed which provides information on recycling materials and used oil. The 1981 recycling directory has been revised to be republished early in FY '83. Other accomplishments include:

The Used Oil Collection Program has grown to over 580 collection facilities. This project has resulted in the recycling of over eight million gallons of used oil in calendar year 1981.

Providing assistance to the Maryland Chamber of Commerce for the operation of the successful Maryland Waste Exchange.

Preparation of a cooperative State-County plan for the disposal of solid wastes over the 1982-1986 period in Montgomery County.

Preparation of a solid waste report, with recommendations, for Kent County in conjunction with MES participation on an ad hoc task force.

Preparation of two solid waste reports for Washington County. The first analyzed the feasibility of processing the County's solid waste at a central facility. The second evaluated the feasibility of a citizen-based recycling program.

During the year, MES produced a report for the Blue Plains user jurisdictions which concluded that all sewage sludge produced by the Plant could be composted on site with the result that no sludge would have to be processed in Maryland.

Assistance was provided to Baltimore City to study composting of sewage sludge at the City's Back River Wastewater Treatment Facility.

HAZARDOUS WASTE FACILITIES SITING BOARD

Mission of the Board

PRIMARY MISSION

Protect the environment and public health by providing a means for locating the necessary storage, treatment and disposal facilities for hazardous and low-level nuclear waste. The Board provides an alternative to local government zoning approval for hazardous waste treatment sites. Before approving a site, the Board must consider site suitability, needs of the State, and other factors specified by law. A brochure describing the Board's purpose, powers, membership,

statutory consideration, and review procedures is available on request.

ASSOCIATED OBJECTIVES

Encourage preferred management techniques.

Consider economic impact of Board policy and actions.

Assess treatment and disposal needs of the State and the impact of management policies on the State's needs.

Make facilities as compatible as possible with objectives of the host community.

Board Policies Adopted in FY 1982

Treatment, Storage and Disposal Needs of the State

Following study of the data on hand, the Board adopted a regulatory policy on the treatment and disposal needs of the State.

Board Endorsement of Preferred Management Techniques

In a resolution accompanying its policy on treatment and disposal needs, the Board declared its preference for waste reduction over recovery, recovery over treatment, and treatment over landfill. The Board also noted its own limitations in implementing such a policy and indicated its intent to work with other State agencies on the subject.

Procedural Regulations

The Board adopted regulations governing submission and review of applications for Certificates.

Applications for Certificates of Public Necessity, FY 1982

The Board received only one application in FY 1982, an application for an expansion of Browning-Ferris Industries' Solley Road hazardous waste landfill. The application, submitted in April, was later withdrawn by the company following a settlement agreement between BFI and Anne Arundel County arising from a law suit not involving the Board.

Studies Initiated in FY 1982

Update of Hazardous Waste Quantities and Facilities Needs in Maryland

Contract with Arthur D. Little, Inc., Cambridge, Massachusetts. Expected completion date: November 1982.

Initial Survey Low-Level Nuclear Waste Quantities and Facility Needs

Contract with University of Maryland at Baltimore. Expected completion date: Late 1982.

Study of Applied Research and Technical Assistance Needs in Hazardous Waste

Contract with University of Maryland at College Park, Civil Engineering Department. Expected completion date: Spring 1983.

Study of In-Plant Waste Reduction and Treatment Options Involving Case Studies and a Pilot Technical Assistance Program to Selected Maryland Manufacturers

Contract with JRB Associates, Inc., McLean, Virginia. Expected completion date: Late 1982.

**Meetings and Seminars
Sponsored by Board**

A seminar for the Board and interested public by Pickett Simpson of New York State Environmental Facilities Corporation on the New York hazardous waste management program.

A "Question and Answer" session for the Board and interested public, with members of the Maryland Environmental Service on the siting studies done by the Service.

A "Question and Answer" session for the Board, the Department of Health and Mental Hygiene and interested public, with members of Fred C. Hart Associates who have contracted with the U.S. EPA to operate the RCRA Hotline, on RCRA regulations.

Public information meetings and press briefing on hazardous waste quantities and facilities needs in Maryland to provide background information for understanding Board policy on treatment and disposal needs.

Seminar for Board with a technical representative of Rockwell International on molten salt incineration.

Publications

Informational brochure, mentioned under "Primary Mission," describes points in the review process at which the public can participate.

Report—*Hazardous Waste Quantities and Facilities Needs in Maryland*, by Arthur D. Little, Inc., for the Board, was distributed to environmental groups, libraries and others on request. A companion summary of the staff report is also available. Over 2,000 reports and summaries were distributed. A few summaries are still available. The work is being updated using 1982 data.

Minutes, special notices and agendas of Board meetings are mailed to public on mailing list.

A publication list is available on request.

Other Activities

Board members and staff are available to speak.

Board Secretary chaired session on Problems of State Planning for Hazardous Waste Disposal, National Convention, American Institute of Chemical Engineers, November 1981. Papers are available.

MARYLAND GEOLOGICAL SURVEY

Budget \$1,771,146
Number of Staff 43

GENERAL DIRECTION

The mission of the 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. The Maryland Geological Survey engages in, sponsors, and coordinates archeological research in the State; it 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 application 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 decreased from \$1,821,859 in FY 81 to \$1,771,146 in FY 82. The overall decrease combined and increase of \$8,026 in General Funds, a decrease of \$27,131 in Special Funds, a decrease of \$59,657 in Federal Funds, and increase of \$28,049 in Reimbursable Funds from other state agencies.

Nine reports, five maps, and nine map atlases were published and made available for distribution.

Committee Activities

Through its Director, the Survey is represented in intrastate and state-federal advisory activities. These functions include the Mid-Atlantic Governor's Coastal Resources Council; Association of American State Geologists; Interstate Mining Compact Commission; Interstate Oil Compact Commission; Committee on Disposal of Excess Spoil and Geological Sciences Board of the National Academy of Science; Maryland Mining Council; State Topographic Mapping Committee; Frederick-Montgomery-Howard County Boundary Line Ad Hoc Committee; Land Reclamation Committee; Bi-State Committee on the Chesapeake Bay; and Outer Continental Shelf Policy Committee.

Exhibits illustrating Survey activities were displayed at the Rose-dale Branch of Baltimore County Library; Chesapeake Appreciation Days and Earth Day at Department of Natural Resources.

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 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; the amount of sediment load in the Potomac River basin; 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

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. Applied research projects of this type are often supported by intrastate matching funds. During FY 82, investigations were underway in areas of Anne Arundel, Baltimore, Caroline, Cecil, Dorchester, Frederick, Garrett, Queen Anne's, and Wicomico Counties, and Baltimore City.

The following projects were active during FY 82:

Stream-Flow Gaging Network

During the year, operation and maintenance of 97 continuous-record stream-gaging stations were continued. In addition, 13 crest-stage, partial-record stations were operated. Data from these stations for the 1981 water year were compiled and published in "Water Resources Data for Maryland and Delaware", U.S. Geological Survey Water-Data Report MD-DE-81-1.

Water Quality and Sediment Network

Surface water samples were collected monthly for chemical analysis at nine network stations and quarterly at thirteen other stations. Regular sampling at three suspended-sediment stations was continued in the Potomac River Basin. Regular sampling at one suspended-sediment station was continued in the Choptank River Basin. Five Federally funded NAS-QAN (National Stream Quality Accounting Network) sampling sites were operated on the Potomac River near Greensboro, on the Susquehanna River at Conowingo, and on the Patuxent River near Bowie. Data from these stations for

the 1981 water year were compiled and published in "Water Resources Data for Maryland and Delaware", U.S. Geological Survey Water-Data Report MD-DE-81-1.

Ground-Water Data Network

This project maintains a continuing inventory of ground-water levels in aquifers and selected springs of the State and relates changes in ground-water levels to withdrawals and precipitation. The regional distribution of observation wells and springs is:

	Wells	Springs
Appalachian Region	10	1
Piedmont Province	8	-
Coastal Plain Province		
Western Shore	32	-
Baltimore Industrial Area	6	-
Eastern Shore	27	-
	-----	-----
Total	93	1

In addition to the 93 wells that comprise the regular network, there are several hundred wells measured synoptically twice a year as part of the Coastal Plain aquifer research and power plant siting projects.

Water Use Data

During FY 82, maps were prepared showing water use by counties. Categories illustrated were total use, industrial (self-supplied), agricultural irrigation, domestic, mine/quarry dewatering and thermoelectric power. Also notable was the development of a data-processing format for converting the water-use categories of the Maryland system to a form compatible with the National system.

Stream-Flow Characteristics

A new compilation of flow characteristics of Maryland streams was completed. The compilation includes statistics for discharges, peak-flow, flood-volume, low-flow, and flow-duration data for 128 continuous-record stations. In addition, peak-flow characteristics

are being provided for 30 crest-stage gages and 7-day, 2-year, and 10-year low-flow characteristics are being presented for 111 low-flow partial records stations. At year's end, an interpretive report was nearing completion.

Modeling of Rock Aquifers in Small Basins

A modified two-dimensional finite-difference model was used successfully to simulate the stream aquifer system in an 8.4 square mile area in Howard County, Maryland. The basin is underlain by deeply weathered crystalline rock and is representative of conditions in most of the Maryland Piedmont. The calibrated model was used to predict the effects of development on long-term average annual conditions for the stream-aquifer system. Hypothetical development schemes included various modes of population distribution, sources of ground-water supply, and waste water disposal.

Spring Survey

Beginning in September 1980, about 100 springs in the Piedmont and Appalachian Provinces of Maryland were examined. Of these, approximately 75 were monitored on a monthly basis for their flow, temperature, pH, hardness, and chloride content. Complete chemical analyses were made of water from 20 springs. The field data are being analyzed and a report describing the results is in preparation.

Eastern Shore Water Table Aquifer

This project was completed in FY 82 and a two-part draft was prepared for colleague review. Part I discusses the hydrogeology of the water table aquifer; Part II is a compilation of selected water well records, ground-water chemical analyses, water level measurements, and lithologic and geophysical logs.

This report is an assessment of the Columbia aquifer in the Maryland portion of the Delmarva Peninsula,

an area commonly called the Eastern Shore. The study defines the boundaries of the aquifer, to describe its flow systems, and to describe the chemical quality of its water. For this study, 96 test wells were drilled, more than 250 observation wells were inventoried, and water samples were collected at 30 wells for chemical analysis.

Nitrate Occurrence in the Eastern Shore Water Table Aquifer

This investigation was initiated in FY 82 with funding support from the Maryland Department of Health and Mental Hygiene. The study is a follow-up of the preceding project and will utilize its hydrogeologic framework. The general objectives of the nitrate project are:

- Describe the chemical quality of the water.
- Map the concentration of nitrate in shallow ground water.
- Relate nitrate presence or absence to land use, soils, farming practices, and the hydrogeologic framework.
- Show the relation of nitrate concentrations to depth in the shallow aquifer.
- Determine nitrate distribution in the deeper aquifers to assess whether nitrate is moving into these aquifers.
- Evaluate changes in nitrate concentrations with time.
- Map direction of ground-water flow to show potential directions of movement of nitrate in ground-water.

Hydrogeology of the Baltimore Industrial Area

Because the last comprehensive investigation of the ground-water resources of the Baltimore industrial area was completed in the early 1950's, emphasis during the initial phases of this new project was directed toward establishing an up-to-date data base. A well inventory and test drilling program was initiated to determine current water levels and water quality trends. At year's end, a preliminary digital model of the Patuxent aquifer was

being calibrated using pumpage data, water levels, and chloride analyses collected during the 1942 to 1982 period.

Hydrologic Effects of Coal Mining in the Upper Potomac Basin

The Mettiki Mine, a large underground coal mine, recently began operation in southwestern Garrett County, Maryland. The present study was undertaken to describe the hydrogeologic system of the area to be mined and to document any changes in the hydrologic regimen that occur as a result of mining. The mine boundaries extend below three main drainage basins, all of which are tributary to the North Branch, Potomac River.

Ground water in the study area occurs in three flow systems: shallow, intermediate, and deep. All three systems are characterized by fracture permeability. Hydraulic conductivities in the shallow flow system are about two orders of magnitude greater than in the deeper systems. The deep flow system, under considerable head, is probably part of a regional system.

Earlier episodes of mining within the study area had significant effects on the hydrologic system, most noticeably on stream-water quality. Effects of current mining were also detected during the study period. The detected effects resulted mostly from mine dewatering.

Surface-water quality was also affected by discharge of treated mine pumpage. The treatment of this water raised its pH and removed dissolved iron, but increased the total dissolved solids content. When the acid mine drainage treatment facility was temporarily inoperative, pH of water sampled at the gage dropped to 4.2, and conductivity dropped from about 870 to about 650 umhos/cm.

A program continued data collection was set up to monitor the hydrologic system as mining progresses.

Hydrology of Frederick County

This project was initiated in FY 82 and has seven objectives:

- Define by sub-basin the total water yield by source.
- Describe the ground-water flow system.
- Indicate potential well yields of the various water-bearing units.
- Estimate average flow, flow duration, and low-flow frequency of streams by subbasin.
- Assess the quality of ground water and surface water.
- Identify changes in water quality.

Hydrology of Cecil County

During the first year of this project, the County was subdivided into subbasins for water budget analyses; began streamflow and water-quality measurements at 25 sites; started a selective well inventory to compile well yield statistics; and commenced measuring water levels in several observation wells equipped with continuous recorders.

Hydrogeologic Aspects of Power Plant Siting

Funds budgeted for this project were used to support in part continued monitoring of observation well stations at Morgantown power plant in Charles County, Chalk Point power plant in Prince George's County, Calvert Cliffs plant in Calvert County, and the Elms site in St. Mary's County. These data help in the preparation of synoptic water level maps and well hydrographs which are being made available to the Maryland Energy Administration.

Coastal Plain Aquifer Studies

Efforts continued during the year to maintain the data base for the digital aquifer models developed during previous studies. Information collected included water-use data, water levels, geophysical logs, water-quality samples, and pumping test data.

During the year, a preliminary evaluation was completed of the deep, brine aquifers of the Waste

Gate Formation, which underlies the eastern Delmarva Peninsula. This analysis suggests that exploitation of the brines for chemical commodities is unlikely because their salinities (<100,000 ppm) are not competitive with commercial brines ($\times 300,000$ ppm) produced elsewhere; and combination of relatively low (125° to 190°F) formation temperatures and permeabilities combine to diminish the geothermal potential of the aquifers.

ENVIRONMENTAL GEOLOGY AND MINERAL RESOURCES

The Environmental Geology Program encompasses areas of geological research, geologic mapping, topographic map compilation and periodic revision, environmental geology applications, and the general dissemination of earth sciences information about Maryland. The Mineral Resources aspect of the Program includes mapping of present and potential resources, mined land, and minerals zoning, and monitoring current activity of extraction of these minerals. Studies such as these provide the basic framework for outlining and managing the mineral and land resources of the State, and generate the geologic data necessary for wise land-use decisions.

BALTIMORE-WASHINGTON URBAN AREA

This project, initiated in 1971 in cooperation with the U.S. Geological Survey, was conceived to provide planners, engineers, governmental agencies, and the general public with earth science data, chiefly geologic and hydrologic, in a format useful in guiding the growth of the rapidly developing Baltimore-Washington metropolitan area. Although U.S. Geological Survey participation ended in 1975, the project was carried on under State sponsorship and continues to yield useful results.

Mapping was completed in the Hereford Quadrangle and in the Lower Marlboro Quadrangle. The Upper Marlboro Quadrangle and

Myersville Quadrangle were completed and sent to the printers. Laboratory/office work continued on the Woodsboro Quadrangle. To date, 26 geologic quadrangles have been mapped within the scope of this project, 12 of which have been published.

OTHER GEOLOGIC MAPPING

Field mapping was completed in the Cumberland Quadrangle in Western Maryland and office work continued on the manuscript map. Work was initiated in the Cresaptown Quadrangle. Field work was completed on the Calvert County geologic map and work began on the manuscript map. Field work continued in Carroll County where extremely low water levels of the Liberty Reservoir have provided excellent outcrops of hitherto unexposed rocks. A lithologic map of the mineral district of southeastern Carroll County was completed with the financial assistance of Carroll County. Work on the leaflet "Cross Section of Maryland" is continuing, which will describe the general geology on some major highways of Maryland.

TOPOGRAPHIC MAPPING

The chief activity carried out of county topographic maps at a scale of 1:62,500, subject to periodic revision to maintain currency. Maps were completed and published of Garrett County and of Charles County. Revisions continued to maps of Baltimore County and Frederick County, with the latter nearing completion. In addition to these activities, the long-term cooperative agreement with the U.S. Geological Survey Topographic Division continues in support of the remapping of 7 quadrangles in the lower Eastern Shore.

MINED LAND INVENTORY MAPS

A map showing the mineral resources and mined land inventory of Carroll County was completed and published with the county's financial assistance. Work continued on the 1981 Chapter of the U.S. Bureau of Mines "Mineral Industry of Maryland."

LANDS FOR POTENTIAL MINERAL RESOURCES DEVELOPMENT

Maps showing lands for potential mineral resources development for the six western Maryland counties have been completed and will be published in FY 83, through a grant from the U.S. Geological Survey.

OFFSHORE ATLANTIC COAST

One exploratory oil/gas well was drilled on the federal offshore mid-Atlantic outer continental shelf (OCS) in FY 82. This was the twenty-ninth well drilled in the Baltimore Canyon Area, five of which encountered non-commercial natural gas accumulation. All non-unitized leases from sale #40 expired. Sale #59 was held in December 1981 and industry spent \$322 million on 50 tracts. Another \$103 million on 48 other tracts, were rejected by the government for insufficiency.

WESTERN MARYLAND GAS

Indigenous Maryland gas continued to be produced in Garrett County from 10 wells in three fields. Two wells were completed in Maryland in FY 82. The Columbia Gas Transmission Corporation drilled a deep field wildcat in the Mountain Lake Park Field of Southern Garrett County which was eventually plugged and abandoned after several weeks of testing. The Texas Eastern Transmission Corporation completed a gas storage well in Accident gas storage field, to help optimize summer injection and winter deliverability capacity of their gas.

POLICY FOR LEASING STATE LANDS

A set of proposed regulations to implement this policy, approved by the Secretary last year, were published in the Maryland Register in early FY 82. Comments were invited and received from interested parties, and a revised set of proposed regulations were published in February 1982. The final regulations will be published in FY 83 followed by the first lease sale, depending on completion of title search.

COASTAL AND ESTUARINE GEOLOGY

The Coastal and Estuarine Geology Program has the responsibility for basic and applied geological investigations in the coastal zone of Maryland. The overall objectives are to determine the processes altering the shorelines of Maryland and to characterize the physical and chemical aspects of the recent sediments of Chesapeake Bay. The program has six operational projects: Basic and Applied Research, Sedimentology, Geochemistry, Benthic Biology, Field Operations, and Special Projects.

Basic and Applied Research

A major effort during FY 1982 was the study of the sand resources behind the Ocean City barrier island in Assawoman Bay. Thirteen vibrocores, 20 feet in length were collected on the flood-tidal shoals, and examined for sand content and volume. A report submitted to the Tidewater Administration concluded that the sand is not of sufficient volume to supplement beach restoration plans.

Semi-annual beach profiling at Ocean City and Assateague Island was continued and provided informational data to the Coastal Resources Division.

SEDIMENTOLOGY

The last of the 4040 surficial sediment samples were collected in support of the Program's EPA grant. Analyses of these sediments will be completed in FY 1983.

The first in a series of 6 Chesapeake Bay Atlases was published; Atlas No. 3. This atlas encompassed the area around Kent Island-Annapolis.

GEOCHEMISTRY

The interstitial water chemistry study was completed with the final laboratory analyses of trace metal contents. These data were incorporated in the draft final report submitted to EPA which included 1200 samples analyzed for various environmental parameters. The

aerial precipitation task completed the field operations and 90% of the laboratory function. Two basic data reports have been submitted to EPA.

BENTHIC BIOLOGY

The final report on the Animal-Sediment Relationships has been submitted to EPA and accepted. A Radiographic Atlas of Chesapeake Bay was published with E. Reinharz the senior author. This atlas is the first of its kind published for Chesapeake Bay.

FIELD OPERATIONS

During FY 1982 the R/V Discovery was scheduled for 101 days including 19 days to the USGS—Department of Health Patuxent River Study. MGS scheduled 37 days on the R/V Discovery for its various projects. Maintenance days totaled 70 including 10 days of major structural repairs, resolving design problems.

SPECIAL PROJECTS

Bathymetric Survey around Hart-Miller Islands was completed in September for Department of Transportation. In progress are three studies: Environmental Assessment of Hart-Miller Islands; (Chesapeake Research Consortium;) Monitoring of Dredging and Overboard Spoil Emplacement, (Water Resources Administration;) Deep Trough Study (Tidewater Administration.)

DIVISION OF ARCHEOLOGY

The archeology program is responsible for research in 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, records of all known archeological sites and investigations in the State, and collections of historic and prehistoric artifacts from all sections of the State. Its resources are available to

the public, governmental agencies, and professional archeologists through publications, lectures, and open files.

In addition to general investigations and service activities, the Division conducted several special projects during FY 82.

HIGHWAY STUDIES

Archeological review and reconnaissance of proposed highway projects has continued since 1975. During FY 82 reconnaissance studies and reports were completed for five highway projects in five counties. In 1981 a new program of preliminary excavation was initiated. It involves extensive testing of potentially significant sites identified during reconnaissance studies. Two sites were excavated in advance of Northwest Expressway construction in Baltimore County. Excavations began at two aboriginal and two historic sites in Anne Arundel County in connection with the proposed Baltimore-Annapolis Expressway. The Division of Archeology provided coordination on several other highway projects including a wide range of sites at eighteenth and nineteenth century Catocin Furnace.

Monocacy Regional Survey

The final report was completed on an extensive field study begun in 1978 of Monocacy River drainage archeology. The investigation developed a predictive model for aboriginal site location that will be useful to planners and cultural resource managers. The model documents that over three-quarters of the 287 known archeological sites in the Monocacy region are located near water, on well-drained soil, and where there is little slope.

Coal Region Survey

Intensive analysis of the prehistoric and historic archeology of the coal region of Garrett and western Allegany Counties was initiated in FY 80 and will continue into FY 83. The study is gathering an archeological data base and designing

a process that will assist in developing criteria for designation of lands unsuitable for surface mining. Extensive historical and field research is continuing, a predictive model for aboriginal site location has been developed, and settlement trends during the historic period are being mapped and analyzed.

Other Activities

In other activities, the Division reviewed many projects and reports submitted by private and governmental organizations, and responded to general information queries. The number of archeological sites recorded in the Maryland Archeological Site Survey increased from 4,297 to 4,678 during FY 82.

The Advisory Committee on Archeology advises the Maryland Geological Survey on archeological matters. It met in July and October, 1981 and in January and April 1982.

In cooperation with the Archeological Society of Maryland for the twelfth year, the Division co-sponsored the Annual Field Session in Maryland Archeology. The Session provides field and laboratory experience for volunteers and assists the Division to undertake needed research on a project for which funds are not available. The FY 82 Field Session was held at a Late Archaic site in Cecil County on the Susquehanna River near Conowingo Dam. It was the second and final season of work at the site by the Field Session.

The Division was awarded two matching grants from the Maryland Committee for the Humanities to design, construct, and install a traveling exhibit on archeology and to sponsor public forums in 12 communities throughout the state. The exhibit and concurrent forums are to take place during the latter half of FY 83.

TIDEWATER ADMINISTRATION

Budget \$10,898,882
Number of Staff 145

The Tidewater Administration, created on July 1, 1979 by Chapter 601 of the Maryland Code, brought under one Administration the Coastal Resources Division, the Waterway Improvement Division, the Tidal Fisheries Division and the General Direction Program which includes all executive vessels and tidewater facilities, sportsfishing and commercial fishing, liaison activities, and the State Boat Act Responsibilities.

GENERAL DIRECTION

This program is responsible for the overall direction, supervision and coordination of activities within the Administration and is divided into three areas.

Administration and Support

This group provides administration and clerical services in all phases of the operation. Budgets, contracts, personnel, purchasing and secretarial services are included with this function.

Boating and Fishing Liaison

Boating Liaison is charged with the liaison between the Department and boating activities within the State, the Coast Guard Auxiliary, the National Weather Service, U.S. Corps of Engineers, United States Power Squadrons, most of the yacht clubs in the Chesapeake Bay Area, marinas, and thousands of individuals. The Guide for Cruising Maryland Waters is published by the Boating Liaison Office. In addition, this office acts as the conduit between the Department and the Boat Act Advisory Committee which advises the Secretary on all rules and regulations affecting the operation or equipment of boats in Maryland.

Commercial Fisheries maintains liaison with the commercial fisheries industry in Maryland. In-

volved is coordination with the State watermen, wholesalers, State Health Department, the State Department of Economic and Community Development, the Environmental Protection Agency and the University of Maryland Sea Grant Program. The Commercial Fisheries News is distributed free to 30,000 subscribers bimonthly.

The Sport Fishing Liaison 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. Contact is maintained with outdoor writers. The fresh and salt water Maryland fishing tournaments are conducted through the Program.

Tidewater Vessels and Facilities

The vessels under control of the group were the AURORA and the FIFTY-FIFTY During FY '82. Their function has been the promotion of Chesapeake Bay and other Maryland waters. Numerous cruises were conducted through the year for the benefit of Maryland citizens.

The facilities currently under control of this group include 69 Prince George Street, the Cambridge Boat Yard, the Matapeake Water Port and the State Pier in Annapolis. The maintenance and operation of these facilities for the benefit of the State is a coordinated conjunctive effort which realizes the maximum utilization of facilities for the least dollar cost.

WATERWAY IMPROVEMENT PROGRAM

The mission of the Waterway Improvement Program is to develop, maintain, improve and promote the recreational and commercial

capabilities, conditions, and safety of Maryland's waterways for the benefit of the general boating public.

The Waterway Improvement Program administers the provisions of the Maryland State Boat Act through four projects.

Hydrographic Operations

Hydrographic Operations is responsible for hydrographic engineering services in establishing and maintaining regulatory buoys and aids to navigation; surveying pound nets and private oyster leases; ice breaking during winter shellfish operations; surveying to determine channel delineation and location of aids to be established, and charting the above functions.

In Fiscal Year 1982 Hydrographic Operations serviced 1,258 regulatory buoys, 379 aids to navigation, and surveyed 8 artificial fishing reefs. In Upper Tangier Sound, steel pile range structures were erected to adequately mark the Dorchester/Somerset County Line for law enforcement purposes.

Six hundred eighty-two corners were relocated, representing 301 acres of private oyster ground leases.

Hydrographic Operations also assisted Tidal Fisheries by plotting 88 days of Bay Bottom Survey from the results of which 9 new Natural Oyster Bar Charts were prepared and are now effective. Sixty-eight oyster seed and planting areas were surveyed/plotted in Maryland waterways and 35 oyster seed plantings were located for the Potomac River Fisheries Commission. Only one clam survey was performed. This project verified 67 buoy locations for Marine Police as evidence in court and engineers were called as expert witnesses in 36 court cases.

Forty-five days were spent in ice breaking operations to clear Smith Island and other select harbors and channels throughout the Bay for commercial watermen. Ten vessel days were expended for statewide promotional activities.

Dredging

Dredging is responsible for State waterway projects involving the dredging and protection of channels and harbors. Activities include conducting hydrographic and topographic surveys over proposed channel areas; design input of all State funded dredging projects; determining the need for protective jetties at project sites; designing and constructing jetties where needed; and performing surveys at previously completed channel dredging sites.

During Fiscal Years 1963 through 1973, 67 projects valued at \$2,052,000 were completed. In the period 1974 through 1981, 48 projects valued at \$4,086,830 were completed.

In Fiscal Year 1982 Dredging completed 7 projects valued at \$598,439.

The project currently has 24 active projects in various stages of development with an estimated value of \$2,574,344.

Waterway Grants and Project Planning

Waterway Grants and Project Planning is responsible for the recreational development of the Chesapeake Bay and its tributaries with particular emphasis on projects and activities directly related to the general boating public. Specific activities include liaison with Federal and State agencies and county and municipal governments in promoting, designing, construction, and financing marine facility projects.

To fund projects beneficial to the general boating public described above, this project distributes the Waterway Improvement Fund in one of the five following groups: matching funds (50% Waterway Improvement Division, 50% re-

questing governing body); 100% funding by the Waterway Improvement Division for the construction of marine facilities located on DNR-owned property; \$5,000 and \$25,000 grants; and interest-free loans for the creation of tax districts to governing bodies for financing waterway improvement projects.

During Fiscal Year 1982 construction continued on three regional boating facilities: Somers Cove Marina, Somerset County; Smallwood State Park, Charles County; and Rocky Gap State Park, Allegany County. Somers Cove Marina is a major State marina complex and when completed will have slips for 486 boats and will include the J. M. Tawes Boating/Visitors' Center which was completed in August 1982.

One hundred thirty-five Waterway Improvement projects with a construction value of \$3,517,886 were partially funded or completed during Fiscal Year 1982. To date a total of 728 projects have been completed in this program at a cost of \$19,335,631 since its inception in 1966.

Marine Services Program

Marine Services is responsible for general waterway maintenance conducted in channels, harbors, and areas of the Chesapeake Bay that are not maintained by the U.S. Army Corps of Engineers. Activities include the removal of debris and derelict vessels from the Chesapeake Bay and its tributaries; the installation of daymarker piles used as aids to navigation; the repair and maintenance of public-owned facilities such as piers, bulkheads, launching ramps, and small dredging operations associated with the above projects. Winter activities include ice breaking operations.

During Fiscal Year 1982, seven State vessels were hauled at the Cambridge Terminal for railway maintenance and repair. The M/V BIG LOU was on ice breaking duty during January and February.

The marine construction crew completed a 1,200 foot concrete

block jetty at Kent Narrows, drove 11 pilings and dredged approximately 100 cubic yards of spoil at the Cambridge Terminal. This project removed a 54 foot sunken vessel near the Bay Bridge and pulled 45 pilings, removed 22 finger piers and a 45 foot derelict work boat at the seafood lab in Crisfield. Twelve piles were driven and 4 piers were repaired at Janes Island State Park. At Somers Cove Marina in Crisfield, this project constructed 243 feet of timber bulkhead, 5 finger piers, 4 dolphin pile structures, removed and replaced 384 feet of decking, placed approximately 700 cubic yards of fill and 432 cubic yards of oyster shells behind bulkhead and dredged 3,600 cubic yards of spoil material.

COASTAL ZONE MANAGEMENT PROGRAM

Coastal Resources Division

The Coastal Resources Division is the designated coordinator of Maryland's Coastal Zone Management Program (MCZMP). The functions carried out within this Program are: providing financial assistance to local governments and State agencies to integrate and address issues of coastal concern, improving the data base for better decision-making information on coastal issues, and making sure that State and local activities are consistent with the goals and objectives of the MCZMP.

Program Direction and Coordination

Activities of the Division are: making Federal, State, local government and citizens aware of the MCZMP and the Division's role within the Program; maintaining and enhancing the networking relationships with Federal, State, and local agencies that have coastal management responsibilities by integrating and focusing their respective programs to address coastal and Baywide issues; carrying out interstate coordination by participating in the Coastal States Organization, the Bi-State Working

Committee for Chesapeake Bay, and the EPA Bay Program; and working towards the establishment of a multi-site National Estuarine and Marine Sanctuary for Chesapeake Bay.

Local Technical Assistance

Activities are to establish and strengthen contacts with local governments and help them address coastal issues through: funding of special studies, referral of their problems to other State or Federal agencies, and funding of coastal positions in these local jurisdictions.

Presently, the Program is funding personnel in all 16 Coastal Counties, the City of Baltimore, the Regional Planning and Tri-County Councils and there are five special studies going on at this time including the protection of Church Creek, the urban waterfront plan for Snow Hill and the management of Zekiah Swamp. This assures support of the MCZMP at the local government level.

Intergovernmental Coordination

Activities in this portion of the Program are:

1. To ensure that Memoranda of Understanding, signed in FY'79, are annually reviewed and updated as appropriate. Memoranda exist between the Department of Natural Resources and the Departments of State Planning, Economic and Community Development, Transportation, Health and Mental Hygiene, and Agriculture. This assures State departmental policy involvement in Program goals and objectives, and
2. To assure Federal agency involvement by reviewing Federal processes, and by applying Federal consistency to their projects.

Public Participation

Activities by the Division include: informing the general public about the MCZMP and how they can become involved; educating the public through special publications

(Coast and Bay Bylines) and displays on coastal matters and; providing support for the 102 member Coastal Resources Advisory Committee (CRAC) which advises the Secretary of DNR on coastal matters and, hence provides guidance for the MCZMP on issues such as dredging, development, wetlands protection, watershed management etc.

Project Evaluation

This part of the Division provides a comprehensive review of all major development projects, A-95 review projects, and projects that could affect but are outside of the coastal zone. The purpose is to ensure the project's consistency with State coastal resources policy, ensure the use of best available information for decision-making, and where necessary, to provide new data necessary to permit agencies in a timely manner. Approximately 3000 projects are reviewed each year.

Special Investigations

The activities carried out by the Division are to improve the quality and extent of management decision-making information necessary to ensure wise use of coastal resources, and it is accomplished through a variety of inhouse and contractual studies. The focus for these investigations can usually be found in one of nine areas including: dredging and material placement, critical areas management, aquatic resources management, shore erosion, resources management, watershed management, economic development, recreational boating, and shore-front access. These investigations are usually performed to help other agencies such as the Open Marsh Water Management Study for the Department of Agriculture or local governments such as the Wicomico Dredge Placement Plan for Wicomico County.

Coastal Fisheries

This activity is carried out in cooperation with Tidal Fisheries Div-

ision and focuses on providing an assessment and management of Maryland's commercial and sports fishing industry.

Coastal Energy Impact Project

The Division administers federal coastal energy impact funds which assist state and local governments in dealing with fiscal, economic, environmental and recreational impacts of coastal energy facilities. The funds can be used to purchase property (e.g. Flag Ponds in Calvert County) or to address specific areas. The study of Baltimore City's coal transshipment in the Harbor and the development of Reedbird Park as a recreational area are examples.

Technical and Data Analysis

The Chesapeake Bay Program was transferred to the Tidewater Administration in FY'81. This activity focuses upon the continued placing of Chesapeake Bay related data and information into computerized storage and retrieval systems at the State and to use these data, together with the management conclusions of the EPA Chesapeake Bay Program to assist the State and local governments and their agencies in making better management decisions on the Bay. Quantitative resource modelling is the capability of this activity carried out by the Division.

TIDAL FISHERIES PROGRAM

At least one-fifth of the State's total area is encompassed in its tidal waters. This extensive area supports widely used populations of valuable finfish and shellfish. Fluctuations in abundance of these populations are increased or reduced by climatic, human, or other causes. The Tidal Fisheries Program monitors species abundance, regulates harvesting activities, collects and analyzes catch statistics, conducts biological investigations, plants oyster shell and seed, and cooperates with other State and Federal activities to enhance Maryland's fisheries. The production trend of seafood since the mid 1960's has

indicated a relatively consistent decline, particularly with anadromous fish species and soft clams. Lesser declines in production of oysters and crabs have occurred. These populations are now apparently stabilizing and increasing in abundance. The Division's goal and management efforts, both short and long term, are to stabilize all fisheries, build up harvest levels, and prevent recurrent declines.

Fisheries Technology and Advisory Services

A revised dealer shellfish landings report was developed to reduce costs and time. A regional shellfish and finfish aquaculture conference and a regional commercial seafood exposition was supported. Managed the 1982 Maryland Sportfishing Tournament and published weekly sportfishing forecasts. Improved hatchery production of striped bass and striped bass hybrids resulted in experimental and stock enhancement plantings in tidal waters.

Fish Environmental Assessment

Commercial net-fishing operations were utilized to characterize the 1981-1982 striped bass fishery and assess the spawning population.

Several thousand man-hours were devoted to compilation and computerization of shellfish environmental condition data. This information has been made available to the EPA Chesapeake Bay Program.

Larval striped bass were examined for implication of viral disease in year class success. Virus did not seem to be a major factor based upon the investigation. Blood samples are being collected from adult striped bass to monitor antibody prevalence.

Tidewater fish kills were investigated and summarized for each year. This information may identify water areas where quality is chronically distressed.

Fisheries Management Plans and Systems Analysis Program

Data obtained from commercial fishermen and processors indicated that during 1981 Maryland commercial landings of shellfish and finfish totaled over 115 million pounds and were valued at over 56.6 million dollars. Oysters and blue crabs contributed most to total value. Blue crab harvests were estimated using a new stratified random survey which replaced the former reporting system from crab pot license holders. This new system is more statistically precise and has been highly praised by managers and researchers in Maryland and Virginia.

The final report on Maryland recreational fishing during 1979 entitled *1979 Maryland Saltwater Sport Fishing Survey* was released. Nearly 913,000 people (residents and nonresidents) fished in Maryland tidal waters (including Ocean City) and caught over 19,600,000 pounds of fish. Progress was made in analyzing sport fishing data for 1980 for comparison with 1979.

In order to improve striped bass management, commercial catch data and juvenile recruitment data were analyzed cooperatively with the University of Maryland. Preliminary results have determined that certain Upper Bay tributaries are more important than others in contributing to striped bass stocks. Spawning success varied between rivers from year to year. Sport fishing survey data was also helpful for evaluating new striped bass management programs such as the potential effects of a fourteen-inch limit on the recreational harvest.

Accuracy and efficiency of data storage and retrieval were greatly increased this year by the addition of a mini-computer to departmental data processing hardware. This resulted in reduced data processing costs and faster generation of reports.

In response to citizen concerns about terrapin mortality in crab pots, a survey of licensed terrapin fishermen was conducted to better

understand problems of the fishery. Survey results will be used to enhance management of this species. Other survey design guidance was provided to fishery biologists sampling eel and striped bass populations.

Program staff participated with the Chesapeake Research Consortium in a major ongoing effort to better coordinate fisheries statistics and data collected by Virginia and Maryland. Since Chesapeake Bay fish species move between States, these efforts will help produce more consistent Bay-wide management. Efforts were also begun to obtain funding from the Atlantic States Marine Fisheries Commission to develop an interstate management plan for shad and river herring.

Anadromous Fish Stream Investigations

Sampling was conducted in the Upper Chesapeake Bay and the Patuxent River to ascertain nursery areas, abundance, and other life history information for young-of-year shad, herring, and striped bass. Fish samples were processed and the data computerized and compared with Virginia river samplings for young-of-year fish.

Streams of the Middle Patuxent River were surveyed to document and inventory dams, and problem conditions affecting the passage and propagation of anadromous and other fish species. Biological sampling was conducted utilizing fish trapping and plankton sampling.

Scales from 3,000 shad and herring were pressed and interpreted for age, sex, and spawning history (pound net samples).

Habitat Evaluation & Technical Assistance

The Technical Assistance project staff comments on the effects of habitat modification on the aquatic environment, reviews permit applications forwarded for comment from other agencies, and evaluated various proposals in the context of their anticipated effects on

aquatic biota. Staff participated in a biota evaluation panel for the Corps of Engineers to evaluate effects of reduced freshwater inflow and represented the Division on a Regional Planning Council task force to develop mitigation and enhancement activities for the Patapsco River.

Over the 1982 Fiscal Year, Issues addressed have been as follows:

1. Testimony on a Federal Energy Regulatory Commission proceeding to require fishways and continuous releases of water at the Susquehanna River Dam at Conowingo. It has been ordered that 5,000 cubic feet per second of water be released from the Dam from April 15 through September 15 until the completion of studies to establish a need for permanent minimum flow.
2. Reviewing a permit for the Spectron Chemical Company, resulting in a judicial order cleaning up several waste handling abuses.
3. Evaluating the impacts of fisheries of using the deeper waters of Chesapeake Bay for spoil disposal.
4. Checking chlorine management at Havre de Grace sewage treatment plant.

American Shad Project

Compilation of the field data collected during the spring of 1981 was completed during FY 82. The analysis follows:

1. The number of adult American shad utilizing the upper Chesapeake Bay to spawn in 1981 was estimated to be 5,477; a 105% increase over the previous year's estimate of 2,675.
2. Analysis of data collected from this adult stock by Tidal Fishery biologists indicated similar population composition as found in 1980. The brood stock was composed primarily of two age classes. A slight increase in the number of age group III males was noted in 1981 over 1980.

3. Sport angling data collected during the spring revealed that an estimated 118 American shad were captured by hook and line in April, May, and June of 1971 as opposed to only 8 in 1980.

4. Extensive haul seine and otter trawl sampling failed to capture any juvenile shad.

Spring 1982 data indicates that the 1982 run of American shad in the Susquehanna drainage was significantly greater than for 1981. A shift to smaller, younger individuals was observed during the 1982 spawning run. An increase in the 1982 sport catch of American shad was also observed during the April through June survey period, with an estimated 266 shad being captured by lower Susquehanna River sport anglers in 1982.

Striped Bass Project

The spawning rivers and areas become the focus of fishing activity in April and May. This year the Department of Natural Resources closed these areas to the taking of a striped bass between April 12 and June 1. In order to determine the characteristics of the spawning population in the same terms as the winter fishery population, four commercial gill net fishing operators were hired to fish the closed areas. The data has been computerized and is being evaluated relative to fishing effort, stock characteristics, and 1982 reproductive success.

An Interstate Striped Bass Management Plan was developed and distributed in 1981 by Scientists, citizens, and administrators from 12 states. The adoption of the Plan by a state commits the state, within the constraints of their social, political, and fisheries situation, to adopt the following recommended management measures.

1. 14 inches total length minimum in Albermarle Sound, Chesapeake Bay, and Delaware Bay.
2. 24 inches total length minimum in all other coastal waters.

3. Retain current maximum size limits.
4. Close spawning areas.
5. A license to sell striped bass.
6. Catch record systems should be designed.

Shellfish Program

Negotiations between the University of Maryland and the Department of Natural Resources to jointly operate the Crisfield Marine Products Laboratory and the Deal Island Shellfish Hatchery were completed.

Oyster harvest during the 1981-82 season was approximately 2.2 million bushels. Spatfall on State-reserved seed areas was of sufficient density to allow the transplanting of 289,000 bushels of seed oyster, approximately 200 watermen utilizing 80 boats took part in the project. Seed was planted on 77 natural oyster beds in 26 separate tributaries and the Chesapeake Bay. Altogether, 10 counties received oyster seed.

Both fresh shells and dredge shells were planted for cultch. Approximately 4.1 million bushels of dredged shells and 405,000 bushels of fresh shells were planted.

Legislation was enacted by the 1982 General Assembly to repeal the one cent per bushel tax on oysters caught outside the waters of the State and imported into the State, and increasing the severance tax from 35 cents to 45 cents per bushel.

A five year project to intensively manage shell and seed placements in the Patuxent River was initiated. Shell plantings will provide a seed area for the exclusive use of the Patuxent River, and to improve cultch availability within the River. Increased oyster harvests from the Patuxent can be expected, beginning in 1985.

Hatchery production of seed oysters for planting in public waters and for sale to private lease holders began in June. The Deal Island hatchery is expected to increase the capacity of spat production to over 100 million spat per month. Oyster larvae and newly set spat will be at the Deal Island facility

throughout the summer to provide instructional material for the general public and a training facility for individuals who are interested in learning low-cost oyster hatchery techniques. The Deal Island facility has a newly installed pier system which is capable of holding 8 to 10 million oyster spat on wire frames.

THE BLUE CRAB MANAGEMENT PROJECT

Continued its annual blue crab population survey in an effort to obtain the relative abundance of each new year class of crabs.

The 1980 hatch of crabs, entering the commercial fishery by mid-summer of 1981, produced a commercial harvest in Maryland unequaled since 1966.

Legislation was enacted to increase the tolerance limit of undersized blue crabs. This new law allows 10 hard crabs per bushel (vs. 4 previously) and 25 per barrel (vs. 10) to be less than 5 inches in width.

SOFT-SHELL CLAMS

Maryland's soft clam landings declined from a 1980 catch of 161,500 bushels to 129,000 bushels in 1981. During July and August, a severe mortality of both market and sub-market clams occurred on most major producing areas, resulting in depressed landing values for both 1981 and 1982.

The Department awarded a contract to the University of Maryland, Chesapeake Biological Laboratory, to conduct a comprehensive study of the environmental impact of hydraulic escalator dredging on oyster communities. Results were consistent with past studies, indicating a 100% oyster mortality inside the dredging zone and a rapid reduction of dredging effects within 75 feet.

Dredged oyster shells were planted on a 10 acre site southwest of Poplar Island in order to improve clam setting and survival. Monitoring of this area in 1981 and 1982 indicated significantly higher clam survival in the shelled area when compared with adjacent barren areas.

Legislation was enacted to raise the soft clam severance tax from 10¢ to 35¢ per bushel.

HARD CLAMS

Hard clam landings increased from 46,000 pounds of clam meats last year to 80,000 pounds. The Department opened the hydraulic dredging season four weeks early to allow clambers to take advantage of an early fall chowder clam market. Catch records indicated seven dredgers landed 19,000 pounds of clam meats during the early season, with virtually all harvesting occurring in the lower portion of Chincoteague Bay.

In an effort to improve hard clam habitat, 43,000 bushels of oyster shells were barged from Chincoteague, Virginia to a 20 acre planting site southeast of Mills Island in Chincoteague Bay. These shells will improve clam setting and survival resulting in additional clam landings beginning in 1984.

The hard-shell clam tax was increased from 5 cents to 25 cents per bag of 105 clams.

BAY BOTTOM SURVEY

Charts for the area from the upper Chesapeake Bay and tributaries, down through Eastern Bay and lower Anne Arundel County waters, were finalized during the year. Public hearings were held on all these charts. Pre-hearing meetings were held with watermen and verification sampling was carried out prior to the final version of the charts.

Current schedule projections indicate that surveying will be completed by the end of calendar year 1982. The charts reflecting the results of the survey will be prepared. These charts will then go to public hearings as the final step in the process.

MARYLAND ENVIRONMENTAL TRUST

Budget\$84,550
Number of Staff 4

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.

With the general objective of fostering a conservation ethic in Maryland, the Trust has one major program, Resource Stewardship, under which there are three main activities: The Conservation Easement Program, Local Projects, and Research and Information Service.

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 to preclude development of their property. The Trust also 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.

It also gathers and disseminates information about environmental issues through its monthly newsletter MARYLAND LANDSCAPE and its clearinghouse for information on waste reduction, recycling, and litter control systems.

In FY 82, these activities were carried out by four permanent employees, three part-time employees, and at least forty four volunteers. The Trust's twelve volunteer members of the Board of Trustees donated their labor for administrative and policy meetings, service on commissions, testimony at hearings, and conservation easement negotiations. The Board as a whole met nine times during the year; other work was performed by

meetings and conference-calls of the Executive Committee and its six advisory committees, for nominations, Keep Maryland Beautiful, Energy & Resource Conservation, Land Development Choices, and Conservation Easements. The Board elected Ellen H. Kelly and Admiral James B. Wilson to succeed Mary L. Jansson and Garrett Power whose terms had expired.

The Environmental Trust was given thirteen conservation easements on 2,059 acres in five counties. Almost all of this land is productive farmland and half of it is located on the Chesapeake Bay. For the first time, the trust was given a conservation easement on farmland within an established agricultural district; in this case the trust received an easement on 188 acres in Harford County which otherwise the State would have had to purchase. Fourteen other easements were in progress. Easement workers also made monitoring visits to thirty-four easement sites and responded to 57 inquiries about donation of easements. This is a 56% reduction of inquiries since FY 1981 and is attributable to the effects of the 1980 and 1981 changes of the I.R.S. Code concerning conservation easement donations.

The Trust has been able to concentrate its easement sites most effectively in Baltimore County, where it now has 2,404 acres at 20 sites. Almost all of this acreage is adjacent or close to other sites in the Natural Register Historic Districts of Worthington Valley, My Lady's Manor, and Western Run-Belfast Road.

The Environmental Trust is responsible for seventy-one easements which restrict use of 15,347 acres in twenty counties and Baltimore City. This is a 23% increase in the number of easements and 16% increase in acreage since the pre-

vious year. In FY 81 the Environmental Trust held fifty-eight conservation easements on 13,288 acres.

During this period the Trust continued its solicitation of donations of conservation easements from landowners in the Chesapeake Bay region based on a priority list of natural areas according to their ecological importance or rarity and the areas' probable 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.

In view of the negative effects of the 1980 enactment of Congress concerning conservation easement donations and the Internal Revenue Service's failure since December 1980 to promulgate regulations to implement this law, the Trust continued its work as a spokesman for Maryland agencies and clearinghouse for information on this matter, collaborating with conservation agencies and trusts elsewhere in the nation. The Executive Director of the Trust was a panelist at the National Consultation of Local Land Trusts, a four-day meeting sponsored by the Lincoln Institute of Land Policy in Cambridge, Massachusetts. This event brought together people from forty-four conservation trusts and agencies and resulted immediately in the formation of a private foundation, the Land Trust Exchange. Another result was the Trust's participation in a conference to help the Appalachian Trail Conference establish a private land trust to assist the National Park Service in acquiring land for the Appalachian Trail.

The Trust continued active on commissions, such as the Citizens

Task Force on State Physical and Economic Development Policies, through Trustee K. King Burnett, and the Hart-Miller Islands Citizens Oversight Committee, through Trustees Wm. Minor Carter, William W. Jeanes, and Garrett Power, and the Coastal Resources Advisory Committee, through Trustee Mary L. Jansson. Trustee Jack F. Witten was appointed to the Bi-state Legislative Commission on the Chesapeake Bay.

As part of its Research and Information Service the Trust continued as a clearinghouse for information concerning recycling, energy conservation, and litter control aspects of mandatory deposit-refund and litter tax systems in the United States. The Trust continued to distribute official reports of mandatory deposit laws in Michigan, Maine, Connecticut, Vermont, and Oregon to all members of the Maryland General Assembly and to many officials of local government.

As a result of the research done on other states' experiences, the M.E.T. Board of Trustees continued to recommend that the State of Maryland adopt a mandatory deposit and refund system for beverage containers. The Trust staff and board members were active in supplying the General Assembly with information about the other states' experiences with such systems as it considered H.B. 867 in the 1982 Legislative Session. The Department of Natural Resources and Department of Transportation joined the Trust and more than 140 organizations in supporting the bill.

After the defeat of this bill, volunteers enabled the Trust to continue its collection of data about mandatory deposit and litter tax laws and distribute it to the public. The deletion of 5% of its budget, however, prevented the Trust from keeping a staffperson working on this issue.

The Trust's monthly newsletter, MARYLAND LANDSCAPE, was published six times and sent to 1,200 public officials, organizations, and individuals.

The Trust continued to distribute copies of its Earth Satellite poster "Our Shores Survived the Winter of '77 . . . Can They Survive Us?" Since 1977, 7,300 copies have been distributed.

The Maryland Environmental Trust has ten volunteer committees and affiliates in Allegany, Baltimore, Charles, Dorchester, Howard, Montgomery, Prince George's, St. Mary's, Somerset, and Worcester Counties. During this period the Dorchester Protective Improvement Association and the Save Prince George's County, Inc. became local committees of the Trust. The Trust combined with the Baltimore Environmental Center to publish a directory of firms in Maryland handling various kinds of recyclable wastes and two fact sheets on disposal of hazardous materials. The Trust also worked on other mutual projects with other organizations, such as the Maryland Historical Trust, Citizens Against Waste (a coalition of 140 Maryland organizations), the Chester-Sassafras Foundation, Inc., Philadelphia Conservationists, Inc., and the Virginia Outdoors Foundation, an agency of state government.

ENERGY ADMINISTRATION

The Energy Administration's mission is to evaluate and facilitate the production and conservation of energy while minimizing adverse environmental effects. This is accomplished by determining the environmental impact of existing and proposed power plants, promoting public and private participation in energy conservation, maintaining balanced fuel allocation within the State in accordance with the needs of the consumer, regulating the environmental impacts of active coal mining, and reclaiming abandoned coal mines. These tasks are the responsibility of three operating programs within the Administration which are the Power Plant Siting Program, the Bureau of Mines, and the Maryland Energy Office.

POWER PLANT SITING

The Power Plant Siting Program provides the technical information to regulatory agencies for determination of appropriate environmental controls on the siting, design, and operation of power plants, without imposing unnecessary costs or delays on the production of electricity. The law provides for:

- 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;

- A dependable fund source for the program by placing a small environmental charge on electricity produced within the state.

Activities are:

- Assessment of the environmental impact of existing power plants.

- Prediction of the impact of future power plants at proposed sites.

- Detailed site investigation, including extensive field data collection at all proposed power plant sites.

- Research to develop an understanding of Maryland's en-

vironmental and socioeconomic structure.

- Site Acquisition which identifies, investigates, acquires, and holds in the Site Bank, an inventory of sites suitable for the construction and operation of power plants.

Major Activities in FY 82 Included

- Review of applications for the Riverside, Crane, Chalk Point, and Wagner Power Plants to determine the need for modifying cooling systems.

- Participation in Certificate Modification Hearing before the Public Service Commission on applications at the Crane and Brandon Shores Power Plants to determine the feasibility of switching from oil to coal.

- Sampling of the Susquehanna River and Upper Chesapeake Bay to determine the radiological impact of normal operations at the Peach Bottom Nuclear Plant, and of activities at Three Mile Island.

- Conclusion of the Public Service Commission hearing process on the Delmarva Power and Light Company's application to build a 500 megawatt coal-fired power plant at Vienna, and review of corresponding applications for discharge, intake and solid waste disposal permits.

- Reevaluation of the suitability of the Bainbridge site to determine the impact of the Department of Labor's efforts to withdraw portions of the site from Federal surplus procedures.

- Commencement of a major effort to quantify "fugitive" emissions of coal and ash dust from such sources as coal-car dumpers, storage piles and transfer facilities at power plants.

- Economic evaluation of the cost-effectiveness of a utility financed residential dwelling weatherization program in the Bal-

timore Gas and Electric Company's service area.

- Consultation with PEPCO on the site selection and environmental study design for their "Station H" application development.

- Study of the effects of Conowingo Dam on resident and anadromous fish populations in the Lower Susquehanna River and participation in the FERC relicensing process.

- Power plant site search in Western Maryland.

Major goals for the coming year include participation in several Health Department, Public Service Commission, and Federal Regulatory Commission Hearings on the cooling system reviews, fuel conversions, and Conowingo Dam relicensing, respectively. Also, the study of utility financed weatherization programs will be extended to include other utility companies.

Activity

	FY81	FY82
Number of Active Mines	94	98
● Tons Mined	3,307,350	3,777,105
● Acres Permitted	1,390	542
● Acres Reclaimed	786	830*
Abandoned Mine Projects	9	3

*Calendar Year 1982 (estimated)

BUREAU OF MINES

The Bureau of Mines has two distinct areas of responsibility: Environmental control of active mines, and reclamation of abandoned mines.

Active Mines

The Bureau evaluates mining plans for proposed deep and surface coal mines. Environmental controls are established and permits must be issued before the mining operation can begin. Active mines are monitored for compliance with the law, regulations, and the approved mining permit.

In February 1982, the U.S. Department of Interior, Office of Surface Mining, approved Maryland's Surface Mining Control Program.

On May 1, 1981, portions of Maryland's federally approved program were temporarily enjoined in the Circuit Court for Allegany County. This injunction was dissolved on July 8, 1982. Maryland is the first coal mining State east of the Mississippi to have an unenjoined program fully approved by the Office of Surface Mining.

Abandoned Mines

State legislation provides for money collected from a surcharge on coal mined in Maryland to be used for reclamation of abandoned mines which cause severe environmental problems. The Bureau is the agency responsible for administering these funds. Additionally, federal legislation (PL95-87) places a fee on coal mined to be used for reclamation of the adverse impacts of past coal mining practices. On July 16, 1982, the U.S. Department of Interior, Office of Surface Mining, approved Maryland's Abandoned Mine Reclamation Plan. This Plan provides for the acceptance and administration of Federal funds (Title IV of PL95-87), for reclamation of abandoned coal mines and related facilities in Maryland.

MARYLAND ENERGY OFFICE

The Maryland Energy Office (MEO) promotes energy conservation programs to benefit all sectors of Maryland's population. The Office also supervises the Residential Conservation Service (RCS) program and emergency planning. Under the State Energy Conservation Plan, the Supplemental State Energy Conservation Plan and the Energy Extension Service, federal funds are brought into the state for specific conservation programs. Much of this work is contractual, involving other state agencies, such as the Department of Economic and Community Development, and the Department of Transportation, the University of

Maryland Agricultural Extension Service.

Maryland Energy Office is the lead agency for emergency Energy Conservation planning. A fifth Steering Committee meeting was held for the purpose of reviewing the Advisory Panel summary on proposed measures. Based on comments of the Panel the list of gasoline and heating oil measures was reduced from 29 to 11 and a diesel fuel measure was added. A contractor will be asked to perform impact analyses on six gasoline and five heating oil and one diesel fuel measure. The RFP to select this contractor was recommended by the Steering Committee and has been submitted to the Department of Budget and Fiscal Planning for approval.

The RCS program is ending its first year with nearly 14,000 audits completed for Maryland homes by public utilities. Training and certification for inspectors of vent dumpers, electrical ignition systems, solar domestic hot water, and wind energy systems was completed for MEO by the Codes Administration, Department of Economic and Community Development. The Master Record of Suppliers, Installers and Lenders has been printed, containing over 500 names. This list has been distributed to the 23 state library systems.

Cycle IV under the Institutional Conservation Program has been completed. The grant application review was made, including the ranking of applications and development of recommendations to the Department of Energy regarding the approval of projects and the level of funding for each. Funding for technical assistance for 29 institutions in the amount of \$137,315 was recommended. Recommended funding for conservation measures was \$777,988 for 27 schools and nine hospitals.

Intergovernmental programs have been exceptionally successful this year. The spring conference in Frederick attracted more than 300 attendees. This conference fea-

tured some exciting new concepts. Driver Energy Conservation Awareness Training (DECAT) was available, two walk-through energy audits of municipal buildings, and a tour of the new Solarex facility. The peer match program has fostered the cooperative spirit—14 actual matches have been made. For example, an expert from the city of Rockville travelled to Baltimore County to advise on Energy management programs. Groundwork on this program was performed by the Metropolitan Washington Council of Governments, under contract to MEO.

Most importantly, these programs, designed to save energy in Maryland, can document BTU savings. Measured in 10^{12} BTU's, program savings were as follows: Thermal Standards 3.25; Transportation 16.58; Agriculture .51; Residential Buildings 11.00; Commercial/Institutional Buildings 7.67; Industrial Programs 7.36; Waste Management Programs 15.26. The total of 61.63 BTU's saved represents approximately 6.7% of Maryland's total energy use.

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