2-1979

The Virginia Institute of Marine Science Its Growth, Status, and Stature a Report on Progress During the Last 20 Years

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Virginia Institute of Marine Science

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Virginia Institute of Marine Science

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The Virginia Institute of Marine Science

ITS’ GROWTH, STATUS AND STATURE

A REPORT ON PROGRESS DURING THE LAST 20 YEARS

by
William J. Hargis, Jr. and Eileen Shea

February 1979
THE VIRGINIA
INSTITUTE OF MARINE SCIENCE
ITS GROWTH, STATUS AND STATURE

A Report on Progress
During the Last 20 years

by
William J. Hargis, Jr.

and
Eileen Shea

February 1979
ACKNOWLEDGEMENTS

We appreciate the critical views and other assistance provided by John B. Pleasants, Miss Martha Germann, Charlotte S. Ashe, Louise B. Kayton and Walter J. Diggles.
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INTRODUCTION*

The Virginia Institute of Marine Science (VIMS) was created almost forty years ago to conduct research and development and provide education in the marine sciences, marine technology and marine affairs. It was also to provide the knowledge and skills marine scientists and resource managers need in order to solve the complex problems they face. Its legislative charter and mandate established by the General Assembly in 1940 have been modified and updated several times since. The Code Sections involved are: 3.1-217.2; 10-190; 23-14; 18.1-195 through 28.1-201; 62.1-13.4; 62.1-13.5; 62.1-3; 2.1-41.2; and 2.1-51.9.

VIMS, now enjoying a national and international reputation as a major oceanographic institution for research, engineering, education and advisory services, is the principal oceanographic institution of the Commonwealth. Its responsibilities and functions are specified in Title 28, Chapter 9 of the Code, often called Virginia's Oceanographic Law, and elsewhere in the Code. Gubernatorial actions have affirmed the earlier actions of the Assembly in declaring VIMS the Coastal Zone Laboratory and the principal marine science program of Virginia. The Institute thus enjoys support from the legislative and executive branches as well as strong support from industry and the general public. The Institute is widely known for the quality of its research and educational programs and for its direct and indirect contributions to governmental and industrial management entities, as well as to the public.

The operations of the Institute are supported by General Funds appropriated by the General Assembly from the treasury of the Commonwealth. Additionally, VIMS is empowered to solicit and utilize funds from sources other than the General Fund. Until recently the majority of financial support for the Institute was from the General Fund of the Commonwealth. Now, about seventy-five percent of its support comes from other sources - mostly federal grants and contracts, with some contribution from industry. It is fortunate that VIMS is able to augment its 2.5 million state appropriation by about 7 million from other sources to provide the funds necessary to accomplish its legislatively mandated roles. It would be better, of course, were the state to provide a larger percentage of the total funds required.

The Institute's principal tasks are: 1) to do research (basic and applied) and engineering development on the marine resources and environments and their uses; 2) to provide or assist in the provision of education in all areas of marine science, at all levels; and 3) to provide advisory and technical services to public and private managers and users (Title 28, Chapter 9 of the Virginia Code). Thus the purposes of the Institute are to learn all it can about the marine resources and environments, to educate students (and teachers) at all levels in the educational process, to help solve marine-related problems of importance to Virginia and to impart knowledge and technical capability to public and private users and managers. Knowledge, skills, relevance and performance are key words.

*Most of this section is excerpted from the 1 August 1978 revision of the VIMS pamphlet entitled Virginia's Official Marine Science, Engineering, Advisory and Educational Program.
The size, programs, performance and stature of VIMS have grown markedly in its nearly forty years of existence. Most of that growth has occurred since 1960. In the following pages major trends and changes in personnel, financing, facilities and Institute output and performance are described through narratives, tables and graphs.
PERSONNEL

Since its beginnings in 1940, and particularly since 1960, VIMS has grown rapidly. Total staff size has increased dramatically from 62 in 1958 to over 500 in 1978. Specifically, the professionals and associates* currently employed by VIMS number 106 compared to 11 in 1958. Within this professional staff, the degree qualifications of VIMS faculty in 1977-78 included 55 PhD's, 1 Juris Doctorate, 16 Masters and 2 Bachelors degrees.

The technical and administrative staff** grew from 8 to nearly 300 during the same 20 year period. Summer employment in 1978, 73 individuals, was six times that in 1958, 12 individuals. Changes in the student population will be discussed in a later section.

*Professionals and Associates include Professors, associate Professors, Assistant Professors, Division Directors, Department Heads, Section Heads, Marine Scientists and Research Assistants.

**Technical and Administrative staffs include Laboratory Technicians and Specialists as well as Secretaries, Clerks, Accountants, Maintenance personnel, Buildings and Grounds personnel and all other positions except graduate students and strictly summer employees.
VIMS
PERSONNEL FIGURES

TOTAL
SUMMER
STUDENTS
TECHNICAL & ADMINISTRATIVE
PROFESSIONALS & ASSOCIATES

YEAR
1947 52 55 58 61 64 67 70 73 76 78

106 294 565

575
550
525
500
475
450
425
400
375
350
325
300
275
250
225
200
175
150
125
100
75
50
25

500
250
100
75
50
25
<table>
<thead>
<tr>
<th>Year (midyear)</th>
<th>Professional &amp; Associates</th>
<th>Technical and Administrative</th>
<th>Students</th>
<th>Summer</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>11</td>
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<td>23</td>
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<tr>
<td>1955</td>
<td>9</td>
<td>6</td>
<td>5</td>
<td>12</td>
<td>32</td>
</tr>
<tr>
<td>1958</td>
<td>11</td>
<td>8</td>
<td>2</td>
<td>41</td>
<td>62</td>
</tr>
<tr>
<td>1961</td>
<td>21</td>
<td>20</td>
<td>8</td>
<td>46</td>
<td>95</td>
</tr>
<tr>
<td>1964</td>
<td>33</td>
<td>42</td>
<td>22</td>
<td>45</td>
<td>142</td>
</tr>
<tr>
<td>1967</td>
<td>43</td>
<td>66</td>
<td>38</td>
<td>30</td>
<td>177</td>
</tr>
<tr>
<td>1970</td>
<td>60</td>
<td>113</td>
<td>66</td>
<td>30</td>
<td>269</td>
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<tr>
<td>1973</td>
<td>98</td>
<td>160</td>
<td>76</td>
<td>50</td>
<td>384</td>
</tr>
<tr>
<td>1976</td>
<td>123</td>
<td>286</td>
<td>80</td>
<td>33</td>
<td>522</td>
</tr>
<tr>
<td>1978*</td>
<td>106</td>
<td>294</td>
<td>92</td>
<td>73</td>
<td>565</td>
</tr>
</tbody>
</table>
# VIMS

## FACULTY

<table>
<thead>
<tr>
<th></th>
<th>Dean</th>
<th>Professor</th>
<th>Associate Professor</th>
<th>Assistant Professor</th>
<th>Instructors</th>
<th>Lecturers</th>
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</thead>
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<td>1</td>
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<td>6</td>
<td>5</td>
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<tr>
<td>1967-68</td>
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<td>5</td>
<td>5</td>
<td>3</td>
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<tr>
<td>1968-69</td>
<td>1</td>
<td>7</td>
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<td>8</td>
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<tr>
<td>1969-70</td>
<td>1</td>
<td>8</td>
<td>6</td>
<td>9</td>
<td>6</td>
<td>0</td>
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<tr>
<td>1970-71</td>
<td>1</td>
<td>8</td>
<td>9</td>
<td>18</td>
<td>6</td>
<td>0</td>
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<tr>
<td>1971-72</td>
<td>1</td>
<td>8</td>
<td>9</td>
<td>18</td>
<td>6</td>
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<tr>
<td>1972-73</td>
<td>1</td>
<td>6</td>
<td>11</td>
<td>26</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>1973-74</td>
<td>1</td>
<td>6</td>
<td>12</td>
<td>16</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>1974-75</td>
<td>1</td>
<td>6</td>
<td>13</td>
<td>23</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>1975-76</td>
<td>1</td>
<td>6</td>
<td>15</td>
<td>24</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>1976-77</td>
<td>1</td>
<td>7</td>
<td>22</td>
<td>23</td>
<td>14</td>
<td>0</td>
</tr>
<tr>
<td>1977-78*</td>
<td>1</td>
<td>7</td>
<td>22</td>
<td>25</td>
<td>15</td>
<td>0</td>
</tr>
</tbody>
</table>

* As of Fall 1977-78, degree qualifications of Faculty of the School of Marine Science of the College of William and Mary (VIMS) were as follows:

<table>
<thead>
<tr>
<th>PhD Degree</th>
<th>Juris Doctorate</th>
<th>Masters Degree</th>
<th>Bachelors Degree</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>55</td>
<td>1</td>
<td>16</td>
<td>2</td>
<td>74</td>
</tr>
</tbody>
</table>
FINANCING

For the 1958-60 biennium, the state allotted $471,060 in Maintenance and Operations funds to the Institute. The receipts from grants and contracts were $82,140, for a total budget of $553,200. The 1976-78 budget, for comparison, totalled $16,158,806, an increase of more than 2800%. Of this total, $1,439,405 was from the General Fund of the Commonwealth, and $11,719,401 was from sources external to the state.

The projected budget for the 1978-80 biennium is $18,805,204, which indicates the Institute's financial growth is continuing. It seems likely that this budget will be exceeded, due to the continuing success of the Institute in attracting outside funds.
<table>
<thead>
<tr>
<th>YEAR</th>
<th>M &amp; O (VA.)</th>
<th>CAP. OUTLAY (VA.)</th>
<th>TOTAL (VA.)</th>
<th>GRANTS &amp; CONTRACTS</th>
<th>GRAND TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1940</td>
<td>$ 4,886.96</td>
<td></td>
<td>$ 4,886.96</td>
<td></td>
<td>$ 4,886.96</td>
</tr>
<tr>
<td>1940-42</td>
<td>10,239.68</td>
<td></td>
<td>10,239.68</td>
<td>900.00</td>
<td>11,139.68</td>
</tr>
<tr>
<td>1942-44</td>
<td>12,186.09</td>
<td>11.56</td>
<td>12,197.65</td>
<td></td>
<td>12,197.65</td>
</tr>
<tr>
<td>1944-46</td>
<td>56,074.62</td>
<td>9,745.30</td>
<td>65,819.92</td>
<td>24,600.00</td>
<td>90,419.92</td>
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<tr>
<td>1946-48</td>
<td>52,098.44</td>
<td>14,261.15</td>
<td>66,359.59</td>
<td></td>
<td>66,359.59</td>
</tr>
<tr>
<td>1948-50</td>
<td>148,491.97</td>
<td>163,335.00</td>
<td>311,826.97</td>
<td></td>
<td>311,826.97</td>
</tr>
<tr>
<td>1950-52</td>
<td>172,651.96</td>
<td>13,595.84</td>
<td>186,247.80</td>
<td></td>
<td>186,247.80</td>
</tr>
<tr>
<td>1952-54</td>
<td>194,590.00</td>
<td>10,850.00</td>
<td>205,440.00</td>
<td></td>
<td>205,440.00</td>
</tr>
<tr>
<td>1954-56</td>
<td>247,602.21</td>
<td>21,979.93</td>
<td>269,582.14</td>
<td>8,240.00</td>
<td>277,822.14</td>
</tr>
<tr>
<td>1956-58</td>
<td>275,300.00</td>
<td>101,400.00</td>
<td>376,700.00</td>
<td>15,760.00</td>
<td>392,460.00</td>
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<tr>
<td>1958-60</td>
<td>471,060.00</td>
<td>-0-</td>
<td>471,060.00</td>
<td>82,140.00</td>
<td>553,200.00</td>
</tr>
<tr>
<td>1960-62</td>
<td>710,992.00</td>
<td>127,506.00</td>
<td>838,498.00</td>
<td>186,967.00</td>
<td>1,025,465.00</td>
</tr>
<tr>
<td>1962-64</td>
<td>950,384.00</td>
<td>145,100.00</td>
<td>1,095,484.00</td>
<td>325,188.00</td>
<td>1,420,672.00</td>
</tr>
<tr>
<td>1964-66</td>
<td>1,064,704.00</td>
<td>189,500.00</td>
<td>1,254,204.00</td>
<td>843,532.00</td>
<td>2,097,736.00</td>
</tr>
<tr>
<td>1966-68</td>
<td>1,430,187.00</td>
<td>493,205.00</td>
<td>1,923,392.00</td>
<td>615,702.00</td>
<td>2,539,094.00</td>
</tr>
<tr>
<td>1968-70</td>
<td>1,949,180.00</td>
<td>181,400.00</td>
<td>2,130,580.00</td>
<td>1,376,002.00</td>
<td>3,506,582.00</td>
</tr>
<tr>
<td>1970-72</td>
<td>2,468,815.00</td>
<td>4,000.00</td>
<td>2,472,815.00</td>
<td>3,213,492.00</td>
<td>5,686,307.00</td>
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<td>1972-74</td>
<td>2,840,047.00</td>
<td>254,340.00</td>
<td>3,094,387.00</td>
<td>4,395,880.00</td>
<td>7,490,267.00</td>
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<td>1974-76</td>
<td>3,428,496.00</td>
<td>85,000.00</td>
<td>3,513,496.00</td>
<td>6,484,347.00</td>
<td>9,997,843.00</td>
</tr>
<tr>
<td>1976-78</td>
<td>4,098,795.00</td>
<td>340,610.00</td>
<td>4,439,405.00</td>
<td>11,719,401.00</td>
<td>16,158,806.00</td>
</tr>
<tr>
<td>1978-80</td>
<td>5,229,990.00*</td>
<td>277,720.00*</td>
<td>5,507,710.00</td>
<td>13,297,530.00**</td>
<td>18,805,240.00</td>
</tr>
</tbody>
</table>

* Appropriated
** Estimate
VESSELS AND SPECIAL FACILITIES

The current VIMS fleet of 45 vessels has grown, almost entirely, since 1960. The 57 foot \textit{PATHFINDER} (acquired in 1957) is the only ship in the current fleet acquired before 1960 and the only one built new and fully paid for from Virginia funds. Since that time, four other large vessels (greater than 50 feet in length) have been acquired by VIMS, including the 144 foot \textit{VIRGINIAN SEA}, the 116 foot \textit{RETRIEVER}, the 82 foot \textit{LANGLEY} and the 80 foot \textit{TERN}. In addition, nine medium-sized vessels (21 feet to 50 feet) and thirty-one smaller boats (less than 21 feet in length) have been acquired to complete the present vessel complement of the Institute.

Some of the many special facilities added to the Institute since 1959 are described in the attached list. Notably these include the following:

1. the Eastern Shore laboratory facility at Wachapreague, with a total square footage of 14,538.76
2. an hydraulic flume
3. the James River Hydraulic Model in Vicksburg, Mississippi- constructed and maintained through a cooperative arrangement with the U.S. Army Corps of Engineers
4. a remote sensing center - equipment for remote sensing data acquisition, reduction and analysis
5. several IBM computer systems, including the current IBM 370-115 with time-sharing, interactive computer terminals
6. microfiche equipment - including camera, copier, reader/printer, reader/filler and several desk-size readers - for the MERRMS information storage and retrieval system
7. a number of major pieces of analytical laboratory equipment including:
   - electron microscope
   - scanning electron microscope
   - mass spectrometer
   - Coulter electronic particle counter
   - atomic energy scintillation counters
   - gas and gas-liquid chromatographs
   - atomic absorption and ultra-violet spectrophotometers
   - electrophoresis equipment and specific-element analyzers
8. several buildings and laboratories designed and/or equipped for specific fields of study - these include Davis Hall which houses Microbiology-Pathology, Parasitology, and Bacteriology; Melville House for Benthic Ecology and the ferry pier in Gloucester Point for Seagrass Ecology and a number of others
9. an observation, photography and transport aircraft - DeHavilland Beaver, DHC-2
10. a Vibracorer system
VIMS
ADDITIONS TO CURRENT VESSEL FLEET

- LARGE (> 50')
- MEDIUM (21' - 50')
- SMALL (≤ 21')
- TOTAL VESSELS IN CURRENT VIMS FLEET

YEAR
1957 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78
NUMBER OF VESSELS

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45
**VIRGINIA INSTITUTE OF MARINE SCIENCE**

**ADDITIONS TO CURRENT VESSEL FLEET**

<table>
<thead>
<tr>
<th>Year</th>
<th>Large Vessels Added*</th>
<th>Medium Vessels Added*</th>
<th>Small Vessels Added*</th>
<th>Cumulative Fleet Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1957</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>1958</td>
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<td>1967</td>
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<td>8</td>
<td>16</td>
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<td>1968</td>
<td>-</td>
<td>1</td>
<td>3</td>
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<td>22</td>
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<td>1970</td>
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<td>24</td>
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<tr>
<td>1971</td>
<td>-</td>
<td>3</td>
<td>3</td>
<td>30</td>
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<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>1973</td>
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<tr>
<td>1976</td>
<td>-</td>
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<td>1978</td>
<td>-</td>
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<td>3</td>
<td>45</td>
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<tr>
<td>Total</td>
<td>5</td>
<td>9</td>
<td>31</td>
<td>45</td>
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</table>

*NOTE: Large Vessels are greater than 50 feet in length; Medium Vessels are between 21 and 50 feet in length; and Small Vessels are less than 21 feet in length.

This chart does not include those vessels that were acquired and relinquished by the Institute and are, therefore, not part of the current vessel fleet.
SPECIAL FACILITIES ADDED SINCE 1959

INFORMATION OFFICE AND ART ROOM

ART:  GAF diazo printer
       IBM MTSC composer
       Veritype Headliner
       Map-O-Graph
       Art Tables with drafting machine (7)

PHOTOGRAPHY:  Copy Camera
               Assorted field cameras
               NU-ARC plate maker

PRINTING:  A.B. Dick 1600 press total copy system
           Baumfolder with right angle folder
           A.B. Dick Velobinder
           A.B. Dick 901 copiers (6)
           A.B. Dick 360 C.D. 11X17 press

DIVISION OF BIOLOGICAL OCEANOGRAPHY

DEPARTMENT OF MICROBIOLOGY PATHOLOGY:

Hitachi HU-11B transmission electron microscope
AMR 1000 scanning electron microscope
Balzers Freeze-Etch Plant
Autoclaves - 1 Castle
                   1 Barnstead
Auto Technicon Duo slide processor
Research quality optical microscopes, time lapse and single frame
       camera equipment
Darkroom facilities (fully equipped - 2 enlargers, print dryer, etc.)
LKB microtome
Temperature Room - Constant
Sterile Air Modules
Gas Chromotography/Integrator

DEPARTMENT OF INVERTEBRATE ECOLOGY

Facilities for processing and analysis of samples of benthos,
including microscopes, ovens, balances, grabs, corers and
a computer terminal
DEPARTMENT OF PLANKTOLOGY:

- Percival Incubator
- Bongo samplers - opening and closing
- Research microscope
- Camera equipment

DEPARTMENT OF MARINE CULTURE:

- Algal tanks (8)
- Oyster flumes (12)
- Oyster setting trays (15)
- Heat Exchangers - Karbate and Corning (4)
- Oyster larval tanks 40 liter and 250 liter (16)
- UV Filtration System
- Zeiss Inverted Microscopes with camera (2)
- Varian Model 3700 Gas Chromatograph and related equipment
- Algal Culture - constant temperature (3)
- Algal Culture walk in rooms (2)
- Hoods (2)
- Air Compressor - 10hp
- Refrigeration compressors - 18 tons total
- Salt water pumps, 5hp, 10hp, 7.5hp, 3/4hp (6 total)
- Metering pumps (4)
- Valves and piping for laboratory (200 valves)
- Pasteurization system for salt water
- Filtration system for salt water
- Water Analyzer Monitor - pH, temperature, salinity, nitrates
- AO microscopes (3)
- Wild Dissecting Microscope (1)
- Fonbrune Micromanipulator (1)
- Micro-Balance (1)
- Automatic Pipettor (1)
- Furnace, 175,000 BTU (1)
- Water still (1)
- Deionization system for water purification
- Refrigerators (3)
- Shaker Tables
- Roto-Evaporator (1)
- Oyster Setting Tank, 250 gallons (1)
DIVISION OF ENVIRONMENTAL SCIENCE AND ENGINEERING SERVICES:

Atomic Absorption Spectrophotometers
  a. Flame
  b. Flameless
Gas Chromatographs with Data Systems
  a. Flame ionization detectors
  b. electron capture detectors
  c. nitrogen-specific detectors
  d. phosphorus-specific detectors
  e. sulfur-specific detectors
Specialized equipment for producing glass capillary columns for gas chromatographs
Mass Spectrometer with both electron impact and chemical ionization coupled with capillary gas chromatograph and data system
Gel Permeation Chromatograph
Carbon-Hydrogen-Nitrogen analyzer
Technicon Auto Analyzer
2 Inverted Microscopes
Submarine photometer
Amino acid analyzer

DEPARTMENT OF ENVIRONMENTAL PHYSIOLOGY:

Liquid Scintillation Spectrometer
NaI(Tl) Solid Crystal Recording Spectrometer
  Proportional Counter
Scaler/Counter
Programmable Desk Calculator
NaI(Tl) Scintillation Crystal Detector
Spectronic 20
Gel Electrophoresis Apparatus
Vacuum Freeze-Dryer (Lyophilyzer)
Incubator
Centrifuge (Table Top)
Controlled Environmental Chambers (3)
Ultra Violet/Visible Recording Spectrophotometer
Pyrochrome Analyzer
Pyrolysis Unit
Gas-Liquid Chromatograph
Chromatographic Integrator
DIVISION OF FISHERIES SCIENCE AND SERVICES:

G.O. Digital Flowmeters (5)
Microscope Illuminators (2)
Illuminators - Desk Type with magnifiers (3)
Kemmerer
TR-10 Analog Computer/plotter
Oscillascopes, Dumont type 304AR and 304H (2)
Coulter Electronic Particle Counter
Atomic Energy equipment including a Scintillation Counter
Hard and soft clam escalator apparatus
Assorted Depuration tanks
Drying ovens
Constant temperature water baths
Strobe light
Soil shakers
Compound microscope
Mettler Balance
MERRMS (began operation ca. 1971):  

Microfiche Equipment, including  
camera  
reader/filler  
copier  
reader/printer  
desk-type readers (several)  

Rear screen projection system with 5 projectors  

DATA CENTER (LARGE COMPUTERS):  

IBM 407 (acquired in 1963)  
IBM 1978 (acquired in 1966)  
IBM 1130 (acquired in 1967)  
IBM 370-115 (acquired in 1975 and currently in use)  

DIVISION OF SPECIAL PROGRAMS (officially formed in April 1977):  

Time-sharing Interactive Computer terminals  
Word Processing system  
RT1 Film Inspection machine  
Hot splicer  
Perf-fix  
35mm slide projectors  
16mm film projector  
Film loop projector  
Filmstrip-cassette projector  
Filmstrip-record projector  
Record player and tape recorder/players  
Cassette system (Wollensak)  
Lap dissolver (Wollensak)  
Screen and Caritel
DIVISION OF PHYSICAL SCIENCE AND OCEAN ENGINEERING:

James River Model in Vicksburg, Miss. - cooperative arrangement with the Corps of Engineers; built ca. 1965

Hydraulic Flume
Remote Sensing Center - equipment for remote sensing data acquisition, reduction and analysis including:
- 70mm and 9-inch format aerial cameras, Kelsh plotter, zoom transfer scope, electronic planimeter, and Landsat computer-compatible magnetic tape software analysis system

MITRON Model MPTR-16EIA Tide Tape Reader, hardwired to the NOVA 1220 Minicomputer
Special Wave Gauge capable of accurately recording wave T and H+
Bausch and Lomb Spectronic 21 with digital readout
LabCon TKN System (12 units)
Fume Hood
pH meters
DO meters and probes
HIAC NT-620 Turbidimeter
Steril-Quik 704 9000-D autoclave
Millipore conductivity meter
Ion Exchanger with conductivity meter
Technicon "Auto-analyzer" with dual channel recorder
Colorimeters
Incubators (BOD)
Vibracorer system

EASTERN SHORE LABORATORY AT WACHAPREAGUE

All of the facilities at the VIMS Eastern Shore Lab have been acquired and/or constructed since 1959.
VIMS has acquired an additional 62.8 acres for its laboratory facilities since 1959. This acreage was acquired from the State (e.g. Highway Department), private corporations and individuals. Buildings which have been constructed and/or improved on VIMS property since 1959 have added a total of 113,930 square feet of work space to the Institute. Of that total, 14,538 square feet comprise the Wachapreague Eastern Shore facility. In all, thirty-one (31) buildings were purchased and/or constructed to augment the Gloucester Point facilities, as well as to establish those at Wachapreague.
VIMS
PROPERTY ACQUISITIONS SINCE 1959

- ANNUAL
- CUMULATIVE

ACRES

YEAR

1959 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76

62.79
### VIMS Property Acquisitions Since 1959*

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*NOTE: These figures are in acres rounded to the nearest hundredth*
VIMS
SQUARE FOOTAGE ADDITIONS SINCE 1959

- - - - ANNUAL SQUARE FOOTAGE ADDED
- - - - CUMULATIVE ADDITION OF SQUARE FOOTAGE

SQUARE FOOTAGE (in Thousands of Square Feet)

YEAR

1959 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77

114.99
VIMS SQUARE FOOTAGE ADDITIONS SINCE 1959*

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**NOTE: Figures are given in thousands of square feet, rounded to the nearest hundredth. Therefore, the total of 114,990. square feet is somewhat larger than the actual figure of 114,723.31 square feet.
OUTPUT AND PERFORMANCE

STUDENTS: The School of Marine Science, a joint venture with the College of William and Mary, and the University of Virginia in the past, has grown in prestige and stature as well as in size. In the 1960-61 academic year, VIMS-W&M received 10 applications and accepted 5 new students. Since then, the number of applications has increased to 299 in 1976-77. In that academic year, 59 new students were accepted and 32 of them enrolled. Total enrollment in the academic program has risen from 19 in 1964-65 to 124 in the fall of 1978. Of these, 40 are doctoral students, 76 are pursuing a Masters degree and 8 are unclassified.

One hundred thirty-three Masters degrees and 38 PhD's were granted to students at VIMS from 1940 through the spring of 1977. Of those, all the doctorates and 120 of the Masters degrees have been awarded since 1959. Ninety seven percent of these graduates are working in the marine science fields for which they have been trained. Graduates of the Institute are actively sought by the oceanographic, governmental and industrial communities. Many have positions awaiting them upon graduation.
VIMS
STUDENT INFORMATION

- APPLICATIONS
- ACCEPTED
- TOTAL STUDENTS ENROLLED
- MASTER'S DEGREES
- Ph.D DEGREES

YEAR
1960-61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77

NUMBERS
400
380
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
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<th>NEW STUDENTS ENROLLED</th>
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OUTPUT AND PERFORMANCE

PUBLICATIONS: In addition to the theses and dissertations of VIMS students and the VIMS Annual Reports, the Institute currently produces eight series of publications. Of these, five were initiated after 1959. A list of the series titles and the total number of publications to date, as well as a breakdown of cumulative series totals in three-year intervals are attached. Publications of all types have increased from a three-year average of 13 in the period from 1959-61 to 86 in the period of 1974-76.
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<th>TITLE OF SERIES</th>
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<td>Marine Resources Advisory Series**</td>
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<td>Special Papers in Marine Science**</td>
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*These figures from the May 1978 VIMS Publication List and include some publications still in print

**Indicates this series was initiated by Dr. Hargis(i.e. since 1959)
<table>
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<tr>
<th>YEARS</th>
<th>CONTRIBUTIONS</th>
<th>DATA REPORTS</th>
<th>EDUCATION SERIES</th>
<th>MARINE RESOURCES ADV. SERIES</th>
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*These figures are as of May 1978
VIMS PUBLICATIONS
CUMULATIVE SERIES TOTALS IN 3 YEAR INTERVALS (A)

- SPECIAL PAPERS IN MARINE SCIENCE
- MARINE RESOURCES ADVISORY SERIES
- DATA REPORTS
- EDUCATION SERIES
- TRANSLATION SERIES
- SPECIAL SCIENTIFIC REPORTS

NUMBER OF PUBLICATIONS

YEAR

40-42 43-45 46-48 49-51 52-54 55-57 58-60 61-63 64-66 67-69 70-72 73-75 76-78

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80

78 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0

12 12 24 25 3
Does not include Theses, Dissertations or Annual Reports
OUTPUT AND PERFORMANCE

SERVICES TO PUBLIC MANAGEMENT AGENCIES AND PRIVATE ORGANIZATIONS:

Services to public management agencies and private organizations and persons have increased markedly since 1959. In 1970 such service contacts amounted to 3680 while in 1977 they were 9741. Institute personnel are increasingly active in advisory and assistance roles to responsible State Legislative bodies and Executive agencies such as the:

Joint Subcommittee for the Study of Shellfish Industries
Erosion Abatement Committee
Task Force for Study of Disposal of Dredge Spoil for Hampton Roads Port Authority
Coastal Resource Management Program for Virginia and
Boating Advisory Committee for the Secretary of Commerce and Resources

Also, Institute faculty members and personnel serve or have served on regional, national and international bodies such as:

Mid-Atlantic Regional Fisheries Management Council
Chesapeake Research Consortium
Atlantic States Marine Fisheries Commission
Coastal States Organization
National Academy of Engineering
National Academy of Science
National Science Foundation
U.S. Navy

32
National Advisory Committee on Oceans and Atmosphere
International Commission for the Exploration of the Seas
Joint U.S. - U.S.S.R. Committee for Cooperative Studies of the World Oceans

Institute personnel have also served on task forces for Federal governmental bodies such as the National Oceanic and Atmospheric Administration, the United States State Department and many others.

SERVICES TO VIRGINIA PUBLIC SCHOOLS AND GENERAL PUBLIC:

In the last ten years approximately 75,000 school children and teachers have visited the Institute for field trips, lectures and movies while a similar or greater number have been exposed during fairs, boat shows, fishing exhibitions, etc. In addition, VIMS regularly participates in conservation programs for teachers at Virginia State College and have held Wildlife Federation camps. Many other direct and indirect contacts with the public have occurred.
VIMS faculty and staff have been involved in the following special advisory bodies, outside VIMS or the College of William and Mary, since 1959:*

**STATE AND LOCAL:**

State Board of Health, Toxic Substances Advisory Council
Water Resources Research Center
Task Force for Coastal Zone Planning for Virginia
Virginia Chamber of Commerce, Marine Resources Committee on Natural Resources and Environment Committee
State Water Control Board, Hampton Roads Energy Oil Spill Task Force
State Health Department, State Water Control Board, Virginia Marine Resources Commission Chlorine Task Force
Office of the Secretary of Commerce and Resources, Boating Advisory Committee
Virginia Resources Information System (VARIS) Task Force
State dune ordinance investigations
State Non-Point Source Pollution Coordinating Committee
State Policy Advisory Committee for 208 Studies
Ports "80" Committee, Virginia Section of American Society of Civil Engineers
Board of Directors, Virginia Section of American Society of Civil Engineers
Kepone Task Force
Land Use Council
Coastal Zone Management Advisory Committee
Coastal Study Commission
Tangier Island Wastewater Management Task Force
Water Quality Standards Advisory Committee (Water Control Board)
Planning District Commission #20, Ad Hoc Committee for Coastal Zone Management
False Cape State Park Access Route Task Force
Hampton Roads Port Authority, Task Force on Disposal of Dredge Spoil
Tangier Island Shore Erosion Task Force of Soil and Water Conservation Commission
Center for Ocean Law and Policy, University of Virginia

*This list is not complete, but is intended to indicate the kinds of special advisory bodies which have benefited from the expertise of VIMS personnel
REGIONAL:

Chesapeake Bay Cooling Water Studies Group
Chesapeake Bay Study Steering Committee
Chesapeake Bay Oil Spill Task Force
Advisory Group for the Chesapeake Bay
Chesapeake Research Consortium, Inc.
Chesapeake Bay Research Council
Mid-Atlantic Regional Fishery Management Council
Atlantic States Marine Fisheries Commission
Coastal Plains Regional Commission, Marine Resources
    Advisory Committee
Coastal States Organization
National Council on Marine Resources and Engineering
    Development, Consultant and Member of Task Group on
    Chesapeake Bay
Mid-Atlantic Biological Task Force
Citizens Program for the Chesapeake Bay
DELMARVA Advisory Committee
Mid-Atlantic Fisheries Development Commission
Organizing Committee for International Symposium on Nutrient
    Exchange in Estuaries-EPA Chesapeake Bay Program
South Carolina's Coastal Research Department in connection
    with NSF Outwelling Project
Potomac River Fisheries Commission

NATIONAL AND INTERNATIONAL:

Outer Continental Shelf Environmental Studies Advisory
    Committee - Department of Interior
American Society for Testing Materials
U.S. Army Corps of Engineers, Permit Task Force
Coastal Society
Coastal Sedimentation Research Group - affiliated with American
    Association of Petroleum Geologists
Water Quality Advisory Committee - American Fisheries Society
Marine Exhaust Research Council
Permanent Chemistry Task Force, Shellfish Sanitation Branch,
    Food and Drug Administration
Office of Technology Assessment
Task Force on Oil Spills in the Marine Environment, National
    Academy of Sciences
Task Force on Ocean Pollution Research, NOAA
Aquatic Toxicology Task Force, AIBS
Sea Grant site visit teams
Advisory Panel for the Office of Sea Grant Programs, NOAA
Sea Grant Colleges Steering Committee
Sea Grant Association, Advisory Service Committee and others
Council of Sea Grant Directors
NATIONAL AND INTERNATIONAL:

Interagency Task Force on Chlorine
U.S. State Department, Marine Science Section, Ocean Affairs
Advisory Committee
National Academy of Science
National Academy of Engineering
National Research Council Assembly of Engineering, Marine
Board, Committee on Offshore Technology
National Advisory Committee on Oceans and Atmosphere
National Council on Marine Resources and Engineering
Development
National Technical Advisory Committee on Water Quality
Criteria to the Secretary of the Interior
Advisory Panel on Ecology, Bureau of Reclamation, Dept of
Interior
National Science Foundation, International Decade of
Ocean Exploration Advisory Panel
National Ocean Industries Association
National Committee on Marine Policy, Board of Trustees
Evaluation Panel for Office of Air and Water Measurements,
National Bureau of Standards
Interagency Committee on Marine Science and Engineering
Joint U.S.-U.S.S.R. Committee for Cooperative Studies of
the World Oceans
VIMS

Number of Teachers, Children and Others Exposed to VIMS*

<table>
<thead>
<tr>
<th>YEAR</th>
<th>ANNUAL VISITORS</th>
<th>CUMULATIVE VISITORS</th>
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<tr>
<td>1968(Dec)</td>
<td>47</td>
<td>47</td>
</tr>
<tr>
<td>1969</td>
<td>5399</td>
<td>5446</td>
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<tr>
<td>1970</td>
<td>4738</td>
<td>10184</td>
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<tr>
<td>1971</td>
<td>8399</td>
<td>18583</td>
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<tr>
<td>1972**</td>
<td>3368</td>
<td>21951</td>
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<tr>
<td>1973**</td>
<td>5646</td>
<td>27597</td>
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<tr>
<td>1974**</td>
<td>4414</td>
<td>32011</td>
</tr>
<tr>
<td>1975**</td>
<td>4315</td>
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<td>1976</td>
<td>7736</td>
<td>44062</td>
</tr>
<tr>
<td>1977+</td>
<td>26112</td>
<td>70174</td>
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<tr>
<td>1978(to Sept)+</td>
<td>39066</td>
<td>109240</td>
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*These figures are based largely on formal group visits to VIMS with the average group size set at thirty (30). The number of individuals exposed to VIMS work through visits to schools by VIMS personnel would raise the totals significantly.

**Since these figures include only those formal groups who came to VIMS, the low annual values reflect the effect of the gas shortage and subsequent cutbacks in school trips as part of an energy conservation program.

+These especially large annual figures include visitors to the VIMS booth at the Virginia State Fair.
These Figures are based largely on group visits to VIMS with an average group size of 30.

+ includes visitors to VIMS booth at State Fair
COOPERATIVE ACTIVITIES

While recognizing its responsibilities and prerogatives as the first and principal organization for marine science in Virginia, the Virginia Institute of Marine Science has always operated cooperatively.

At its inception in 1940, the Virginia Fisheries Laboratory (VIMS’ predecessor), was a joint creature of the College of William and Mary and the Virginia Fisheries Commission (now the Virginia Marine Resources Commission). The Institute has been affiliated with the College of William and Mary since. In 1963 it undertook a joint academic program with the University of Virginia which, though being phased out by the Council of Higher Education, will continue until the last U.Va. student graduates.

In 1948, VIMS plus the University of Maryland (Chesapeake Biological Laboratory-CBL) and the Johns Hopkins University formed and financed the Chesapeake Bay Institute (CBI) of the Johns Hopkins University. In 1964, VIMS, CBL and CBI formed the Chesapeake Research Council. Later VIMS, the Johns Hopkins University, the University of Maryland and the Smithsonian Institution established the Chesapeake Research Consortium, Inc., now an active, integrating force in regional marine science.

VIMS has consistently worked with administrators, faculty members, scientists and students of other institutions, making its facilities available for joint as well as individual use. For example, faculty members serve on student committees in other institutions, including Old Dominion University, and individuals and field-trip groups from many other institutions use the facilities of both the Gloucester Point and Wachapreague campuses frequently.

In recent years, the VIMS Sea Grant program has involved an increasing number of organizations, growing from three (VIMS, ODU and George Mason University) in the proposal submitted in 1976 to eight (VIMS, George Mason, U.Va., Norfolk State College, Virginia State College, ODU, Marshall-Wythe School of Law of the College of William and Mary and the School of Education of the College of William and Mary) in the proposal for 1979.

The greatest amount of interaction between VIMS and other academic organizations has taken place in the last two decades, since 1960.