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ABSTRACT
This report is the latest in a series of annual reports to the President and Congress on total Federal obligations (excluding loans) awarded to indiviaual institutions of higher education and selected nonprofit institutions. A major portion of the report focuses on Federal obligations to universities and colleges for research and development, $R \& D$ facilities, and science education. Science education is examined in terms of three broad areas of support: fellowships, traineeships, and training grants; general support for science; and facilities and equipment for instruction in science and engineering. Data on Federal funding of nonscience activities are also given to provide a total picture of Federal support of higher education. In addition to analysis by type of activity are analyses and tabulations showing agency sources of support, trend data, field-of-science data, distribution of funds by State, distribution of funds ty institution, and distribution of funds by type of control. (Author/MJM)

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## A REPORT TO THE PRESIDENI AND CONGRESS

# Federal Support to Universitt 





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Ioycano, Robert J. and Sale, Suzanne
Federal Support to Universities, Colleges, and Selected Nonproit Institutions, FY 1971
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# $\infty$ <br> 761 <br> <br> Federal Support to Universities, <br> <br> Federal Support to Universities, Colleges, and Selected Nonprofit Institutions, Fiscal Year 1971 



[^0] Price: $\mathbf{\$ 2 . 1 0}$, domestic postpoid, $\mathbf{\$ 1 . 7 5}$, GPO Bookstore Stock No. 3800-00140

## LETTER OF TRANSMITTAL

DEAR MR. PRESIDENT:
I have the honor to transmit to you this report, Federal Support to Universities, Colleges, and Selected Nonprofit Institutions, Fiscal Year 1971 as required by the National Science Foundation Act as amended through August 1968.

## Respectfully,

H. GUYFORD STEVER

Director
National Science Foundation.

## The Honorable <br> The President of the United States

Identical letters have been sent to:
The President of the Senate.
The Speaker of the House of Representatives.

## general notes

- The Federal obligations in this study were reported by 14 agencies that accounted for more than 95 percent of all Federal support to universities and colleges.
- The Federal obligations shown in this report for the 74 selected nonprofit research institutes and 27 Federally Funded Research and Development Centers (FFRDC's) administered by nonprofit institutions comprised approximately 85 percent of total Federal support to all research institutes and FFRDC's managed by non profit institutions.
- Hospitals, professional and technical societies, academies of science, museums, and philanthropic foundations are not included in this study. These types of organizations account for approximately 40 percent of total Federal R\&D support to nonprofit institutions other than universities and colleges.
- Federal obligations are reported for the Federal fiscal year, ending June 30 of the year shown.
- Educational data are for the academic year, 1969-70.


## acknowledgments

This report was developed in the Statistical Division of Science Resources Studies, under Kenneth Sanow, Head. The survey was condu under the direction of William L. Stewart, S demic Science Studies Group. The data we written by Robert Loycano and Suzanne Sale. preparation of statistical material.
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## acknowledgments

This report was developed in the Statistical Surveys and Reports Section, Division of Science Resources Studies, under special guidance of the late Kenneth Sanow, Head. The survey was conducted and the report prepared under the direction of William L. Stewart, Study Director, Federal Academic Science Studies Group. The data were compiled and the report written by Robert Loycano and Suzanne Sale. Irene Woodall supervised the preparation of statistical material.

## FOREWORD

This report is the fourth in a series of amual reports to the President and Congress on curtent patterns of Federal funding of research, development, and other science-related activities at universities, colleges, and other nonprofit institutions, as required by the 1968 amendment to the NSF Act of 1950. Funding patterns are examined in terms of specific types of science activities, fields of science, agency sources of support, and geographic and institutional distribution of funds. The source of the information is the Government-wide data system established by the Committee on Academic Science and Engineering (CASE).

We extend our appreciation to staff members of the cooperating agencies, without whose help this compilation would be impossible. The analysis and preparation of the report were carried out by the Division of Science Resources Studies, Thomas J. Mills, Director. The Management Information Office, George Pilarinos, Management Information Officer, was responsible for processing the data.

H. Guyford Stever<br>Director<br>National Science Foundation

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## HIGHLIGHTS

## TCTAL FEDERAL OBLIGATIONS

- Total Federal obligations (exclusive of loans) to institutions of higher education increased both in current and constant dollars from 1970-71. The current-dollar volume went up 5253 million, or 8 percent, to a record level of $\$ 3,480$ million. In constant dollars Federal funding increased 2 percent, the first such increase since 1967 (page 2).
- The Department of Health, Education, and Welfare (HEW) increased its share of total Federal funding to institutions of higher education from 64 percent in 1970 to 65 percent in 1971 by virtue of a $\$ 212$ million increase in agency support (page 3).
- The first 100 universities and colleges in Federal support accounted for more than $\$ 2.4$ billion during 1971, or 69 percent of Federal funds to all academic institutions (page 5 ).
- Private universities and colleges receiving Federal support outnumbered public institutions receiving Federal funding 1,242 to 1,126 in fiscal year 1971; public institutions, however, accounted for 61 percent of total Federal obligations, 65 percent of all degrees awarded, and 75 percent of all students enrolled (page 6).


## aCADEMIC SCIENCE OBLIGATIONS

- Federal funding of academic science activities was up $\$ 148$ million, or 7 percent, to a level of $\$ 2,336$ million. Federal obligations for academic science rose for all major sponsoring agencies except the Department of Defense (DOD) and the Atomic Energy Commission (AEC) (page 7).
- Federal funding of academic R\&D activities also increased by 7 percent to $\$ 1,544$ million. The largest increases came from HEW - $\$ 81$ million - and the National Science Foundation (NSF) - $\$ 16$ million (page 9).
- In 1971 life sciences R\&D funding a mounted to approximately $\$ 741$ million, or 48 percent of all Federal R\&D obligations. HEW accounted for $\$ 567$ million in life sciences R\&D, or 76 percent of total R\&D in the life sciences (page 9).
- Fellowship, traineeship, and training grant support, comprising nearly onefifth of total academic science funding, declined by 2 percent to $\$ 421$ milIon in 1971. Of the nine Federal agencies supporting training programs in the sciences and engineering, HEW predominated with 86 percent ( $\$ 361$ million) of the 1971 total (page 13).
- The life sciences received - $\$ 225$ million in fellowship and traineeship support, nearly $31 / 2$ times the level of funding for the next ranking field, the social sciences. HEW was the principal source of support in each of the major fields of science (page 14).
- Obligations for general support for scie tered principally by NSF and the Nat amounted to $\$ 100$ million in 1971, vin (page 19).

FEDERALLY FUNDED RESEARCH A (FFRDC'S)

- Federal obligations to academically ass percent to $\$ 984$ million in 1971 . The . tinuing to lead all other agencies in the se for 64 percent of the Federal total in 19


## SELECTEO NONPROFIT INSTITUTIONS

- In 1971 Frderal R\&D obligations to a research institutions amounted to $\$ 173$ r for nearly four-fifths of the Federal to 1971 (page 30).
- Federal support to FFRDC's administe by 21 percent to $\$ 216$ million in 197 totaled $\$ 158$ million in 1971, or 73 perc
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Hion in fellowship and traineeship : funding for the next ranking field, Ipal source of support in each of the

- Obligations for general support for science programs, which are administered principally by NSF and the National Institutes of Health (NIH), amounted to $\$ 100$ million in 1971, virtually the same level as in 1970 (page 19).


## FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTERS (FFRDC'S)

- Federal obligations to academically associated FFRDC's increased by 2 percent to $\$ 984$ million in 1971. The Atomic Energy Commission, continuing to lead all other agencies in the support of such centers, accounted for 64 percent of the Federal total in 1971 (page 22).


## SELECTED NONPROFIT INSTITUTIONS

- In 1971 Federal Ra[- nb!, gations to a selected group of 74 nonprofit research institutions amounred to $\$ 173$ million. DOD and HEW accounted for nearly four-fifthe of tire Federal total going to these institutions in 1971 (page 30).
- Federal support to FFRDC's administered by nonprofit institutions fell by 21 percent to $\$ 216$ million i:i 1971. DOD obligations to FFRDC's totaled $\$ 158$ million in $\{971$, or 73 percent of the Federal total (page 37).


## INTRODUCTION

## Background

This report constitutes the fourth in a series of annual reports to the President and Congress, authorized by Section 3(a)(7) of the National Science Foundation Act of 1950, as amended in 1968, on Federal obligations for research and development and R\&D plant at institutions of higher education and selected other nonprofit organizations. The report also represents the seventh annual report on Federal obligations for academic science and other educational activities. This latter responsibility was undertaken by the National Science Foundation on behalf of the Committee on Academic Science and Engineering (CASE) of the Federal Council for Science and Technology (FCST) which, in 1965, established the data collection system that now serves both reports.

As a report to the President and Congress, this publication contains information on the distribution and pattern of Federal obligations for research and development among the Nation's universities, colleges, associated Federally Funded Research and Development Centers (FFRDC's), and selected other nonprofit institutions. The report provides analyses by geographic locality and institution, including comparisons of the distribution of Federal R\&D support with certain educational variables such as the distribution of science degrees awarded.

The FCST's interest extends not only to Federal R\&D support to universities, colleges, and associated FFRDC's, but also Federal funds for other academic science and nonscience programs. Emphasis is also placed, therefore, on broader views of Federal involvement in higher education (total and academic science funding) as well as on other (non-R\&D) types of Federal support.

## Scope and Limitations of Data

Data included in this report for fiscal year 1971 were reported by 14 Federal agencies:

[^1]Office of Elonomic Opportunil: Environmental Protection Agent Department of the Interior (late Agencv tor Internation.il Develo Department of L.abor (l.abor) National Aeronatiacs and Spate National Sucence I oundation (N) Depiniment of Ifansportation !
Excluding the Atomic En costs, dollar amounts repres during a fiscal year, regardl from the responding agencie support going to the instituti includes data on 2,368 unive ated FFRDC's. Part II includ ing organizations and 27 FFR

Obligations clata for uni awarded directly to individ Federal employee training, a of higher education. This ir agencies during the Govern: June 30. The date of award a the date an award is receive there may not be strict con agencies and those computed

Another difference betw totals occurs for institution stances an agency cannot rep institutions receiving the ful award under a systemwide fice." "Central system" tot ligated to 24 systems in fisc. represent less than 1 percen of higher education, the und lation to individual institutic totals can be significant sin of a system are understated. work down to them.

The data collection syste 1971. The system modificati to include additional categor

[^2]In a series of annual reports to the Section 3(a)(7) of the National Scided in 1968, on Federal obligations plant at institutions of higher educanizations. The report also represents ,bligations for academic science and responsibility was undertaken by the of the Committee on Academic Scideral Council for Science and Tech,hed the data collection system that
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to Federal R\&D support to universibut also Federal funds for other aca8. Emphasis is also placed, therefore, ent in higher education (total and n other (non-R\&D) types of Federal
cal year 1971 were reported by 14

Office of Economic Opportuntiv (OEO)
Environmental Protection Agency (f.PA)
Department of the Intertor (Intertor)
Agencv for International Development (AiD)
Department of Labor (Labor)
National Acronautus and Spate Administration (NASA)
National Science Foundation (NS F)
Department of Transportation (DOT)
Excluding the Atomic Energy Commission, which reported in terms of costs, dollar amounts represent actual obligations incurred by the agencies during a fiscal year, regardless of when the funds were expended. Funds from the responding agencies comprised more than 95 percent of all Federal support going to the institutions covered by this study. Part I of this report includes data on 2,368 universities and colleges and 31 academically associated FFRDC's. Part II includes information on 74 selected research performing organizations and 27 FFRDC's managed by nonprofit institutions.

Obligations data for universities and colleges include Federal support awarded directly to individual institutions. Excluded are loans, funds for Federal employee training, and funds obligated to State agencies for support of higher education. This report covers total funds obligated by Federal agencies during the Government's fiscal year, beginning July 1 and ending June 30. The date of award as recorded by a Federal agency may differ from the date an award is received or accepted by an institution. For this reason, there may not be strict comparability between totals reported by Federal agencies and those computed by the institutions themselves.

Another difference between Federal agency and individual institution totals occurs for institutions comprising university systems. In some instances an agency cannot report an award in terms of the individual member institutions receiving the funds and, consequently, must include the entire award under a systemwide entry entitled "central system" or "system office." "Central system" totals in this report amounted to $\$ 28$ million obligated to 24 systems in fiscal year 1971. ${ }^{1}$ Although these total obligations represent less than 1 percent of Federal obligations to all U.S. institutions of higher education, the undistributed obligations may be substantial in relation to individual institutions. The effect on some individual institutional totals can be significant since obligations reported for member institutions of a system are understated to the extent that "central system" obligations work down to them.

The data collection system used to develop this report was revised in 1971. The system modifications resulted in more detailed repoiting of data to include additional categories of support and field of science information. ${ }^{2}$

[^3]Part I

FEDERAL SUPPORT TO UNIVERSITIES AND COLLEGES

## Section 1. TOTAL, ACADEMIC SCIENCE, AND R\&D ACTIVITIES

## Total Federal Support

## TRENDS

Total Federal obligations (exclusive of loans) to institutions of higher education increased both in current and constant dollars from 1970-71. The current dollar volume went up $\$ 253$ million, or 8 percent, to a record level of $\$ 3,480$ million. In constant dollars Federal funding increased 2 percent, the first constant-dollar increase since 1967.

The 1971 upturn in Federal funding (current dollars) of universities and colleges contrasted sharply with the 7-percent decline in 1970 and the relatively stable funding levels from 1967-69. Support for R\&D and educational activities was up 7 to 10 percent over 1970 levels. Educational programs classified as "nonscience" activities continued the lead in dollar growth among the major categories of activity. In the last year nonscience funding was up $\$ 105$ million, or 10 percent-the largest dollar and rulative increase among the major categories of support. The 1970-71 gain in nonscience funding raised the share of such funds to 33 percent of the Federal total.

This section of the report focuses on three levels of Federal funding: (1) total Federal support; (2) Federal funding of academic science activities; (3) Federal support for academic research and development. Each level of funding is viewed in terms of agency, geographic, and institutional distributions of support in 1971. Emphasis is also placed on any major fluctuations or shifts in ' early funding amounts, particularly from 1970-71.

Federal obligations to universities
[Billions of dollars]



Type of program

## Total

Academic science
Research and development
R\&D plant
Other science
Nonscience activıties
SOURCE: National Science Foundation (CAS

## MIC SCIENCE, AND R\&D ACTIVITIES

three levels of Fed.
2) Federal funding al support for acalevel of funding is nd institutional disis is also placed on $\checkmark$ funding amounts,
S) 10 institutions of higher edInt dollars from 1970-71. The or 8 percent, to a record level funding increased 2 percent,
int dollars) of universities and I decline in 1970 and the relsupport for R\&D and educa1970 levels. Educational proontinued the lead in dollar $\because$ In the last year nonscience the largest dollar and relative ort. The 1970-71 gain in nonto 33 percent of the Federal

Federal obligations to universities and colleges
[Billions of dollars]

[Billions of current dollars] Growth by type of program


| Type of program | Average annual growth (Percent) |  | Percent change |
| :---: | :---: | :---: | :---: |
|  | 1963.67 | $1967 \cdot 70$ | 1970.71 |
| Total | +24 | -1 | $+8$ |
| Academic science | +i5 | - 2 | + 7 |
| Research and development | r12 | $+4$ | + 7 |
| R\&D plant | +1 | -26 | -33 |
| Other science | +23 | -8 | $+9$ |
| Nonscience actuvities | +84 | + 2 | $+10$ |

SOURCE: National Science Foundation (CASE).

Average growth of Federal support of higher education compared with other economic variables


SOURCE: Natıonal Scsence Foundation (CASE).

Total Federal obligations to universities and colleges, by agency


SOURCE: National Science Foundation (CASE).

During the first half of the last 8 -yeat Federal support to universities and col as great as the growth rate of gooss nat eral budget outlays, and nearly double expenditures. The rapid rate of growth sult of the initiation of several new pus during this period, including the High and the Higher Education Act of 1965 ed a reversal of the relationship betwee funding and growth in other economic er education activities grew slowly at GNP, total Federal budget outlays, and increased at rates of 7.2 percent, 7.5 pe

AGENCY DIS

With the exception of the Departme major funding agencies reflected the lex einment-wide support levels during the ever, there was no uniform pattern of creased by 8 percent; two of the six m . and AEC, posted declines of 9 peicen other agencies, NSF and NASA, regist percent, respectively. The Federal-wid traced primarily to a $\$ 125$ million rise crease in OE funding, and a $\$ 33 \mathrm{mil}$

Health professional schools account funding to universities and colleges in came from NIH and $\$ 197$ million came Health Administration (HSMHA). Med million in HEW obligations, up $\$ 77 \mathrm{n}$ total. Of this amount, NIH provided cent) and HSMHA allocated $\$ 172$ millic

The leading three Institutes of NIH obligations to universities and college Medical Sciences- $\$ 134$ million; the $N$ $\$ 125$ million; and the National Cancer Institutes posted 1970-71 increases of million ( 34 percent), respectively, refld the President and Congress on the figl heart and lung.
education compared

olleges, by agency


During the first half of the last 8 -year perisd the average annual growth of Federal support to universities and colleses was approximately three times as great as the growth rate of gross nationat product (GNP) and total Federal budget outlays, and nearly double the? growth of total higher education expenditures. The rapid rate of growth of Federal funding was largely a result of the initiation of several new programs called for in legislation passed during this period, including the Higher Education Facilities Act of 1963 and the Higher Education Act of 1965 . The latter 4 years, however, witnessed a reversal of the relationship between growth in Fedetal higher education funding and growth in other economic areas. Federal funding levels for higher education activities grew slowly at at average rate of 1.3 percent while GNP, total Federal budget outlays, and total higher education expenditures increased at rates of 7.2 percent, 7.5 percent, and 12.6 percent, respectively.

## AGENCY DISTRIBUTION

With the exception of the Department of Agriculture (USDA), all of the major funding agencies reflected the levelling off, or actual drop, in the Gov-ernment-wide support levels during the 1967-70 period. For 1970-71, however, there was no uniform pattern of change, although overall funding it:creased by 8 percent; two of the six major sources of Federal support, DOD and AEC, posted declines of 9 percent and 8 percent, respectively. Two other agencies, NSF and NASA, registered increases of 0.1 percent and 2 percent, respectively. The Federal-wide increase of $\$ 253$ million may be traced primarily to a $\$ 125$ million rise in NIH support, an $\$ 83$ million increase in OE funding, and a $\$ 33$ million increase in USDA obligations.

Health professional schools accounted for just over $\$ 1.1$ billion in HEW funding to universities and colleges in 1971 . Of this amount $\$ 885$ million came from NIH and $\$ 197$ million came from the Health Services and Mental Health Administration (HSMHA). Medical schools received a total of $\$ 868$ million in HEW obligations, up $\$ 77$ million, or 10 percent, over the 1970 total. Of this amount, NIH provided $\$ 679$ million (an increase of 13 percent) and HSMHA allocated $\$ 172$ million.

The leading three Institutes of NIH accounted for $\$ 351$ million in 1971 obligations to universities and colleges: the National Institute of General Medical Sciences- $\$ 134$ million; the National Heart and Lung Institute$\$ 125$ million; and the National Cancer Institute- 592 million. The latter two Institutes posted $1970-71$ increases of $\$ 27$ million ( 27 percent) and $\$ 23$ million ( 34 percent), respectively, reflecting the recent emphasis placed by the President and Congress on the fight against cancer and diseases of the heart and lung.

## GEOGRAPHIC DISTRIBUTION

The East North Central Division dropped from first to third in receipt of Federal funds to universities and colleges and was the only division that received less funding in 1971 than in 1970.

| Geographic division | Percent change <br> $1970-71$ |
| :--- | ---: |
|  |  |
| Middle Atlantic | 8.5 |
| Pacific | 9.5 |
| East North Central | -4.2 |
| South Atlantic | 2.5 |
| New England | .9 |
| West North Central | 31.8 |
| West South Central | 20.0 |
| East South Central | 18.0 |
| A:ountain | 7.8 |

The decline was attributable to a $\$ 40$ million drop in Ohio's total. Ninety percent of the Ohio decrease, however, resulted directly from the return to a more typical funding level for the University of Cincinnati which, in 1970, received a grant of $\$ 35$ million for construction and improvement of medical school facilities.

Four other States showed lower totals in 1971 than in 1970-Florida, $\$ 19$ million; Massachusetts, $\$ 13$ million; Virginia, $\$ 6$ million; and Washington, $\$ 0.7$ million. Of the five States posting lower 1971 totals, four were located in the eastern part of the Nation.

Universities and colleges located in the four western divisions have been receiving an increasing share of total Federal obligations over the past several years. The trend continued in 1971: the combined proportion of the Federal total went up from 35 percent in 1970 to 38 percent in 1971. The combined 1970-71 growth for academic institutions in the four western divisions was nearly five times the combined growth for institutions in the eastern States. The shifting geographic distribution of funds was reflected in the increase in the number of leading recipient institutions located in western States - from 35 out of 100 institutions receiving the largest Federal funding in 1970 to 39 in 1971. The West North Central and West South Central States each placed two more institutions among the first 100 recipients. Institutions in these divisions also received the largest relative increases among all divisions -32 percent and 20 percent, respectively.

The District of Columbia joined recipients of Federal obligations in 19 received and total academic degrees a sum for the first 10 States would i California, Massachusetts, Michigan, showed considerable variance - more relative level of funds received and rel

Universities and colleges in two of setts, accounted for 13 percent of institutions, and 18 percent of Fedd looking at the divergence between re funds received for these two States, tion of total Federal funding to ac: into R\&D supnort, which shows litt grees awarded.' In 1971 Federal R tions in California and Massachuse respectively, of total Federal funds throughout the remainder of the Unit

first to third in receipt of is the only division that re-
crcent change
1970.71

8.5
9.5
-4.2
2.5
.9
31.8
20.0
18.0
7.8
drop in Ohio's total. Ninety lirectly from the return to a Cincinnati which, in 1970, ind improvement of medical
than in 1970-Florida, $\$ 19$ 6 million; and Washington, 71 totals, four were located
western divisions have been gations over the past several ed proportion of the Federpercent in 1971. The comn the four western divisions institutions in the eastern inds was reflected in the initutions located in western the largest Federal funding al and West South Central ng the first 100 recipients. he largest relative increases espectively.

The District of Columbia joined with 9 States in becoming the leading recipients of Federal ibligations in 1971. The correlation of total obligations received and total acaciemic degrees awarded in all fields is not as close as the sum for the first 10 States would indicate - 54 percent versus 51 percent. California, Massachusetts, Michigan, Ohio, and the District of Columbia all showed considerable variance - more than 1 percentage point - between the relative level of funds received and relative level of degrees awarded.

Universities and colleges in two of these States, California and Massachusetts, accounted for 13 percent of all degrees conferred by U.S. academic institutions, and 18 percent of Federal funding to all U.S. institutions. In looking at the divergence between relative numbers of degrees awarded and funds received for these two States, it should be noted that a large proportion of total Federal funding to academic institutions in these States goes into R\&D support, which shows little correlation with total number of degrees awarded.' In 1971 Federal R\&D funding levels at academic institutions in California and Massachusetts were 58 percent and 69 percent, respectively, of total Federal funds compared to 41 percent for institutions throughout the remainder of the United States.

[^4]Total Federal obligations to universities and colleges in the $\mathbf{1 0 ~ S t a t e s}$ receiving the largest amounts compared to total degrees awarded

| State | $\begin{aligned} & \text { Percent of } \\ & \text { total } \\ & \text { obligations } \\ & \text { FY } 1971 \\ & \hline \end{aligned}$ | Percent of total degrees owarded $A Y^{*} 1969.70$ | [Millions of dollars] |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| California | 11.3 | 8.8 |  |  |  |  |  |
| New York | 9.8 | 9.5 |  |  |  |  | FY |
| Massachusetts | 6.7 | 4.1 |  |  |  |  | FY 1970 |
| Pennsylvania | 5.0 | 5.8 |  |  |  |  |  |
| Texas | 4.5 | 4.9 |  |  |  |  |  |
| Illinois | 4.4 | 5.2 |  |  |  |  |  |
| Michigan | 3.5 | 4.7 |  |  |  |  |  |
| Ohio | 3.2 | 5.0 |  |  |  |  |  |
| North Carolina | 3.0 | 2.2 |  |  |  |  |  |
| District of Columbia | 2.8 | 1.1 |  |  |  |  | 1,885 |
| Total, 10 States | 54.2 | 51.2 |  |  |  |  |  |

- Academic year

SOURCE: National Science Foundation (CASE).

Distribution of total Federal obligations to the 100 universities and collegess rectiving the largest amounts compared to selected educational data
[Percest of total)


INSTITUTIONAL DIS

Funding concentration insrased from 19 95 universities with funds exceeding $\$ 10 \mathrm{~m}$ of Federal support to all institutions of high $\$ 3$ universities in the $\$ 10$ million category total Federal support. Institutions receiving in Federal funding decreased from 1,873 i share of total Federal funding also declined

Number of universities and co Federal obligations ranked by program, fiscal year

IDotars in thousat

|  | Total obligations |  |
| :---: | :---: | :---: |
| Size of Federal progrom | Amount | $d i$ |
| Toial | S3.452.134 ${ }^{\text {a }}$ |  |
| S10 milion or more | 2,357.069 |  |
| S5 million to $\mathbf{5 9 . 9}$ milion | 343.810 |  |
| S1 milion to 54.9 mulion | 367.628 |  |
| \$500.000 to S999.000 | 158.334 |  |
| \$100.000 to \$499,000 | 183.027 |  |
| Less than \$100.000 | 42.266 |  |

a Does not include $\$ 28,016.000$ reported under central or these funds could not be tabulated for individual membin from this tature
SOURCE Nationat Science Foundation (CASE).
The substantial variance between the pr degrees a warded for the States reflect simil The accompanying chart shows that the fir: received 17.4 percent of all Federal obligat cent of all degrees and enrolled only 4.0 widens steadily for each group of 10 insti institutions in total funding. Totals for il 69.1 percent of Federal obligations, 32.6 23.6 percent of students enrolled.
$s$ and colleges in the 10 States to total degrees awarded
[Millions of dollars]


## s to the $\mathbf{1 0 0}$ universities hts compared to selected

 higher education, 1970
$\frac{1}{60}=70 \div 80 \cdots 10$
institutions.
fice of Education.

## INSTITUTIONAL DISTRIBUTION

Funding concentration increased from 1970 to 1971. In 1971 there were 95 universities with funds exceeding $\$ 10$ million, accounting for 68 percent of Federal support to all institutions of higher education; in 1970 there were 83 universities in the $\$ 10$ million category and they received 61 percent of total Federal support. Institutions receiving less than one-half million dollars in Federal funding decreased from 1,873 in 1970 to 1,828 in 1971. Their share of total Federal funding also declined from 6.8 percent to 6.5 percent.

Number of universities and colleges receiving
Federal obligations ranked by size of Federal program, fiscal year 1971
[Dollars in thousands|

|  | Total obligations |  | institutions |  |
| :---: | :---: | :---: | :---: | :---: |
| Size of Federal program | Amount | $\begin{gathered} \text { Percent } \\ \text { distribulion } \end{gathered}$ | Number | Percent distribution |
| Total | S3.452,134 ${ }^{\text {a }}$ | 100.0 | 2,368 | 100.0 |
| S10 million or more | 2,357.069 | 68.3 | 95 | 4.0 |
| S5 million to 59.9 milion | 343.810 | 10.0 | $4 ;$ | 2.0 |
| S1 million to S 4.9 million | 367.628 | 10.7 | 174 | 7.3 |
| S500.000 to 5999.000 | 158.334 | 4.6 | 224 | 95 |
| S100,000 to \$499,000 | 183,027 | 53 | 800 | 33.8 |
| Less than S100,000 | 42.266 | 1.2 | 1.028 | 43.4 |

${ }^{\text {a }}$ Does not include $\mathbf{\$ 2 8 . 0 1 6 . 0 0 0}$ reported under central offices of university systems (centrat systems). these funds could not be tabulated for individual member institutions and, therefore, were excluded from this table.
SOURCE. National Scienc. Foundation (CASE).
The substantial variance between the proportion of funds received and degrees awarded for the States reflect similar differences in the institutions. The accompanying chart shows that the first 10 institutions in total funding received 17.4 percent of all Federal obligations, but awarded only 6.1 percent of all degrees and enrolled only 4.0 percent of all students. The gap widens steadily for each group of 10 institutions comprising the first 100 institutions in total funding. Totals for the first 100 institutions showed 69.1 percent of Federal obligations, 32.6 percent of degrees awarded, and 23.6 percent of students enrolled.

Federal obligations to unive degrees awarded and total er


Total degrees award AY* 1969.70

[^5]SOURCE: Natinnal Science Founda

[^6]Federal obligations to universities and colleges compared to total degrees awarded and total enrollment, by type of control

## ITUTION

controlled institutions grew at a it in privately controlled institutons is evidenced by the follow-
cges receiving Federal support I 26 in 1971, public institutions obligations, 65 percent of total enrollment.
private institutions was approxin 1971. 594 thousand versus
in total Federal obligations in vate institutions.
of federally supported public of federally supported private


## Academic Science Support

Federal obligations for academic science rose for all major sponsoring agencies except DOD and AEC. HEW and USDA accounted for more than 90 percent of the total increase of $\$ 148$ million. Figuring prominently in this increase were NIH programs and USDA's cooperative extension prograri funded through the Smith-Lever Act.

Academic science obligations are more concentrated by geographic area than are total Federal obligations. The 10 States receiving the largest amounts of Federal academic science funds accounted for 59 percent of all Federal academic science funds; the first 10 States in total Federal obligations received 54 percent of total funding. As in the case of total funding there was considerable variance between relative levels of funding and relative levels of science and engineering (S\&E) degrees awarded for certain States: on the one hand, the shares of Federal academic science obligations received by Massachusetts and Maryland were nearly twice the proportion of S\&E degrees awarded, while the share of academic science obligations allocated to institutions in Ohio was only two-thirds the proportion of S\&E degrees awarded by Ohio schools. Still, eight of the first 10 States in terms of S\&E degrees awarded were among the first 10 States in Federal academic science funding.

Federal obligations for academid


SOURCE: National Science Foundation (\$

Federal obligations for academ the largest amounts compared degrees awarded

| State | Percent of <br> obligations <br> FY 1971 | Percent of S\&E <br> degrees <br> AY*1969.70 |
| :--- | :---: | :---: |
| Californıa | 13.1 | 10.5 |
| New York | 10.8 | 9.9 |
| Massachusetts | 8.6 | 4.4 |
| Pennsylvanıa | 5.0 | 6.2 |
| Illinois | 4.9 | 5.1 |
| Texas | 4.3 | 4.6 |
| Michigan | 3.7 | 4.4 |
| North Carolina | 3.2 | 2.2 |
| Ohio | 3.1 | 4.6 |
| Maryland | 2.7 | 1.4 |
| Total, 10 States | 59.3 | 53.4 |

* Academic year

SOURCE National Science Foundation id

Hic science rose for all major sponsoring HEW and USDA accounted for more than , if $\$ 148$ million. Figuring prominently in hd USDA's cooperative extension piogram .l.
re more concentrated by geographic area ns. The 10 States receiving the largest fuce funds accounted for 59 percent of all the first 10 States in total Federal obliga|l funding. As in the case of total funding etween relative levels of funding and relaering (S\&E) degrees awarded for certain es of Federal academic science obligations yland were nearly twice the proportion of hare of academic science obligations allo, only two-thirds the proportion of S\&E Still, eight of the first 10 States in terms ong the first 10 States in Federal academic

Federal obligations for academic science, by agency
[Millions af a lllars]

SOURCE: National Science Foundation (CASE).

Federal obligations for academic science in the 10 States receiving the largest amounts compared with science and engineering degrees awarded


[^7]

The extent of concentration of academic science funding in 1971 among the first 10 and first 100 institutions remained unchanged from the previous year. The first 10 accounted for 23 percent of total funds for academic science while the first 100 received 82 percent of the Federal academic science total.

The 1970.71 percent change for the individual universities comprising the first 10 recipients varied considerably. Two Massachusetts institutions, Massachusetts Institute of Technology and Harvard University, declined 11 percent and 1 percent, respectively, while two California institutions, the University of California - San Diego and University of California - Berkeley, showed gains of 26 percent and 23 percent, respectively.

Federal obligations for academic science to the 10 universities receiving the largest amounts


SOURCE: National Science Foundation (CASE).

## R\&D Support

Federal R\&D obligations to universities and colleges
Ey agency
[Millions of dollars]



## SOURCE: Nationnal Science Foundation ICASE

Federal $R \& D$ funding to univ one-tenth of total Federal R\&D s to $\$ 1,544$ million in 1971 . This is cent higher than in 1969. The lar lion - and NSF - $\$ 16$ million. Of agencies, $\$ 17$ million was reported Protection Agency (EPA). Much o for programs transferred from oll decrease was the $\$ 24$ million declin

FIELD

In 1971 research and develop approximately $\$ 741$ million, or 4 HEW provided $\$ 567$ million for ences, or 76 percent of total acad Physical sciences R\&D obligation DOD, AEC, NSF, and NASA conll

Engineering ( $\$ 160$ million) and together accounted for nearly on engineering R\&D obligations wit NSF was first in environmental sci-

Social sciences R\&D funds am half came from two agencies, He porting academic research in the Economic Opportunity (OEO), (AID), and Labor.

Principal financers of research a DOD, and NSF, which together a Federal total of $\$ 57$ million.

The smallest of the major fiel mathematics with $\$ 41$ million. P HEW, accounting for nearly nine-1

## R\&D Support

rities and colleges
By agency
lions of dollars]

y field of science
[Percent]

(se).

Increases in the share of total R\&D support between 1970 and 1971 may be noted in life sciences, environmental sciences, and social sciences. ${ }^{3}$ The social sciences experienced the greatest relative growth as a result of sizable increases reported by HEW, USDA, DOD, and NSF. In addition, AID and the Department of Labor, which were not included in the 1970 data, contributed a total of $\$ 12$ million in social science $R \& D$.

The most significant decline in R\&D funding occurred in the physical sciences. The overall level of Federal support dropped by approximately $\$ 26$ million. Within the physical sciences, physics support declined by an estimated $\$ 21$ million.

[^8]
## GEOGRAPHIC DISTRIBUTION

There has been little change in the State distribution of academic R\&D obligations between 1970 and 1971. Except for the addition of Wisconsin and deletion of Ohio, the 10 leading States remained the same. The concentration of R\&D support also remained at nearly the same level over the last 2 years; between 46 percent and 47 percent of all $R \& D$ obligations went to the first five States and 63 percent of total R\&D obligations went to the leading 10 States.

Federal R\&D obligations to univers receiving the largest amounts comp in the sciences and engineering


[^9]SOURCE: Natıonal Scıence Foundation (CAS

I between 1970 and 1971 miy nces, and social sciences. ${ }^{3}$ The :e growth as a result of sizable nd NSF. In addition, AID and neluded in the 1970 data, conc R\&D.
oding occurred in the physical ort dropped by approximately hyysics support declined by an

- Clasbification of program funds among other serences, nee.e." I urthermore. the ohing 11 percent of DOD's 1970 R\&D - feanons. plecae measurement of changen


## IBUTION

distribution of academic R\&D 1 for the addition of Wisconsin emained the same. The concenlly the same level over the last 2 all R\&D obligations went to the obligations went to the leading

Federal R\&D obligations to universities and colleges in the 10 States receiving the largest amounts compared to $\mathrm{Ph} . \mathrm{D}$. degrees awarded in the sciences and engineering


[^10]The leading 10 institutions in R\&D funding received $\$ 418$ million, or 27 percent of all Federal academic R\&D obligations in 1971. These institutions tepresent less than 2 percent of all recipients of Federal academic R\&D support and less than one-half of I percent of all universities and colleges. They also account for one-fifth of all Ph.D. degrees awarded in the sciences and engineering.

These 10 institutions received nearly one-half of NASA's academic R\&D support, nearly one-third of DOD's R\&D obligations, and from 23 percent to 29 percent of total R\&D support from three other major funding agencies - HEW, NSF, and AEC.

There were some notable shifts from 1970 to 1971 in the relative amount of Defense research performed at individual institutions. The major decline in DOD support was a $\$ 17$ million decrease in obligations to the Massachusetts Institute of Technology. This decline was of sufficient proportion to have the effect of reducing the Defense shate of the university's total Federal R\&D funding from nearly one-half in 1970 to one-third in 1971. Other leading institutions such as Stanford University, Columbia University, and the Universty of California at Los Angeles showed increases in their overall levels of R\&D support but experienced declines in excess of $\$ 1$ million in DOD funding.

The distribution of R\&D obligations among the leading universities and colleges followed nearly the same pattern in 1971 as in 1970. The first 10 tistitutions received a slightly lower share of the total: 27 percent in 1971 versus 28 percent in 1970. The first 100 institutions accounted for 86 percent of all R\&D obligations in each of the 2 years. The concentration of R\&D funding among the leading academic recipients has declined since 1963. The share of the R\&D total for the first 10 institutions in each of the years 1963, 1967, and 1971, declined from 34 percent to 29 percent to 27 percent, respectively. For the first 100 institutions a similar trend is noted 90 percent in 1963, 88 percent in 1967, and 86 percent in 1971.

Federal R\&D obligations to the 10 u the largest amounts


[^11]
## I. DISTRIBUTION

) funcling received $\$ 418$ million, or 27 , obligations in 1971. These institutions cipients of Federal academic R\&D supont of all universities and colleges. They ). degrees awarded in the sciences and
ly one-half of NASA's academic R\&D R\&D obligations, and from 23 percent from three other major funding agen-

Im 1970 to 1971 in the relative amount dividual institutions. The major decline ccrease in obligations to the Massachudecline was of sufficient proportion to he share of the university's total Federal in 1970 to one-third in 1971. Other University, Columbia University, and angeles showed increases in their overall ced declines in excess of $\$ 1$ million in

Ons among the leading universities and ittern in 1971 as in 1970. The first 10 , hare of the total: 27 percent in 1971 100 institutions accounted for 86 perof the 2 years. The concentration of wademic recipients has declined since " the first 10 institutions in each of the . I from 34 percent to 29 percent to 27 ) 0 institutions a similar trend is noted. 67, and 86 percent in 1971.

Federal R\&D obligations to the 10 universities receiving


SOURCE: National Science Foundation (CASE).

For 1970 and 1971 the share of Ph.D. degrees awarded in the sciences and engineering by the leading $R \& D$ institutions remained at the same level for the first 10 universities but showed a slight drop for the first 100 institttions - from 86 percent to 82 percent. Ph.D. degrees awarded in science and engineering by institutions other than the 100 leading R\&D universities increased 60 percent between academic years 1968 and 1970. This rapid growth accounted for the relative decline of $\mathrm{Ph} . \mathrm{D}$. awards by the leading R\&D universities.

Distribution of Federal R\&D obligations to the 100 universities and colleges receiving the largest amounts compared to Ph.D. degrees awarded in the sciences and engineering


## - Academic year

- SOURCE: National Science Foundation (CASE).

In 1971 Federal funding to un clined by $\$ 15$ million to $\$ 30$ milli began in 1965. Part of the $\$ 14.8$, table to the fact that some R\&D pl of the other recently added reporti ment for instruction in science and

The agency lireakdowi of R\&il HEW (NIH) - $\$ 15.2$ million; NSF $\$ 0.2$ million. Ten institutions rece R\&D plant support from Federal de

Federal obligations for R\&D pla receiving the largest amounts, F


SOURCE: Netional Science Foundation (1
ces awarded in the sciences and lemained at the same level for drop for the first 100 institudegrees a warded in science and 10 leading R\&D universities in, 1968 and 1970. This rapid Ph.D. awards by the leading
the 100 universities compared to Ph.D. degrees

## R\&D PLANT

In 1971 Federal funding to universities and colleges for R\&D plant declined by $\$ 15$ million to $\$ 30$ million, continuing the downward trend which began in 1965. Part of the $\$ 14.8$ million decline reported in 1971 is attributable to the fact that some R\&D plant funding is included under one or more of the other recently added reporting categories such as "facilities and equip. ment for instruction in science and engineering."

The agency breakdown of R\&D plant support for 1971 was as follows: HEW (NIH) - $\$ 15.2$ million; NSF - $\$ 9.7$ million; AEC - $\$ 4.8$ million; NASA $\$ 0.2$ million. Ten institutions received $\$ 22.2$ million, or 74 percent of total R\&D plant support from Federal agencies.

Federal obligations for R\&D plant to the 10 universities and colleges receiving the largisst amounts, FY 1971


SOURCE: National Science Foundation (CASE).

## Section 2. SCIENCE EDUCATION ACTIVITIES


#### Abstract

Suence education enenmpases a broad spectrum of ataties which range trom eategorical athities such as (1) the traming of indwduals through tellowshtp and traneeship programs: (2) the improtenent of sctence instruction at all educational levels bv upgrades' materials, curriculums, methods of teathing. and teacher eduestion: and (3) the provision of modern instructional fachities and equipment: to the more comprehenste and flexible general support programs wheh are designed to improve overall institutional capabilites in serence educstion and research. Moreover, research con-


ducted th the Natan"s unnervites and colleges is in tielt an integrat part of the xience edecation process in that it is a major sourte of new and innowatice ideas and, at the same ime. it provides tranming evperrence for tuture sctentists and ensaneers.

This section of the report desls with those science education atwities that are classified separatels in the CASE: reporting ustem. fiese malude: leliouships, traneeships. and training grants: general support for science: and tatiities and equspment for insiruetion in science and engincerint.

## Fellowships, Traineeships, and Training Grants

In 1971 Federal funds for the direct support of individuals through fellowships, traineeships, and other training programs amounted to $\$ 421$ million, comprising 18 percent of the 1971 academic science total. The 1971 level of support for these programs represents a decline of 3 percent since 1969, the first year in which CASE collected funding data on such direct support. While these training activities principally support individuals engaged in graduate training or study, the total includes funds for training activities from the precollege through the postdoctoral levels.

## AGENCY DISTRIBUTION

Although nine Federal agencies reported obligations for fellowships, traineeships, and other training grants in 1971, only three agencies HEW, NSF, and EPA, funded these activities to a significant extent with 1971 totals of $\$ 361$ million, $\$ 42$ million, and $\$ 10$ million, respectively.

The other six agencies sponsoring training programs in the sciences and engineering together accounted for less than 2 percent of the 1971 total. Three of the six agencies awarded more than $\$ 1$ million in 1971. These were
the Department of Transportation with obligations of $\$ 3$ million, and ministration with $\$ 1$ million.

The Department of Health, Ed predominant supporter of manpoy 1971 feilowship and traineeship 1 the $\$ 361$ million in HEW obligatis port of the medical and health-re National Institutes of Health. Of 1 72 percent was allocated to training

Other components within HEN tion's scientific training support. L tal Health Administration granted fellowships and .raineeships; the ( Social and Rehabilitation Service, obligated by the Food and Drug Ad


## EDUCATION ACTIVITIES

## nd Training Grants

rect support of individuals through felIning programs amounted to $\$ 421$ mil1971 academic science total. The 1971 represents a decline of 3 percent since collected funding data on such direct ties principally support individuals enthe total includes funds for training acne postdoctoral levels.

## ISTRIBUTION

ported obligations for fellowships, train1971, only three agencies HEW, NSF, a significant extent with 1971 totals of Auillion, respectively.
training programs in the sciences and: ess than 2 percent of the 1971 trial. ore than $\$ 1$ inillio? in 1971. These were
the Department of Transportation and the Atomic Energy Commission, each with obligations of $\$ 3$ million, and the National Aeronautics and Space Administration with $\$ 1$ million.

The Department of Health, Education, and Welfare continued to be the predominant supporter of manpower training, providing 86 percent of the 1971 fellowship and traineeship total, the same proportion as in 1970. Of the $\$ 361$ million in HEW obligations for 1971, nearly one-half was in support of the medical and health-related training programs sponsored by the National Institutes of Health. Of the $\$ 169$ million in NIH funding in 1971, 72 percent was allocated to training grants ancl 28 percent to fellowships.

Other components within HEW also contribute substantially to the Na tion's scientific training support. During 1971 the Health Services and Mental Health Administration granted 599 million to universities and colleges for fellowships and traineeships; the Office of Education, 552 million; and the Social and Rehabilitation Service. $\$ 40$ million. The remaining $\$ 1$ million was obligated by the Food and Drug Administration.

Federal obligations to universities and colleges for fellowships, traineeships, and training grants, by agency


[^12]Total NSF suppori for traning in the sciences and engineering was $\$ 10$ million less in 1971 than in 1970 - a decrease of 20 percent. This decline in direct training support reflects principally the phasing out of NSF's Graduate Traıneeship Program, a process which began in 1970 when the last new dwards were granted. Tranceships awarded in 1971 covered only commitments from prior years. It is expected that decreases in the number of graduate students supported through this program will be partially offset by inureases in the number of students supported through research grants.

Although the Environmental Protection Agency provided Iess than 3 percent of the 1971 Federal fellowship and tranceship funds, such funds constituted more than one-third of EPA's total academic science funding. This was the largest proportion among the nine agencies funding training programs.

Of the Federal agencies which reported funds for fellowships, traineeships, and training grants in both 1970 and 1971, only two, NIH and SRS (both HEW constituents), registered increases for 1971. NIH's 2-percent increase reflects in part the fret that it was the only agency in 1971 with funds for new traineeship a

## FIELD OF SCIENCE

Because of the dominance of HEW in support of training actıvities, over one-half of the 1971 funds for fellowships, trainceships, and training grants are concentrated within the life sciences. Moreover, the 1971 support level of $\$ 225$ million for the life sciences was nearly $31 / 2$ times the level of support for the next ranking field, the social sciences. Fifty-eight percent ( $\$ 130$ million) of the life sciences funds supported fellowship and traineeship programs in clinical medicine.

The extent to which HEW components dominated support varied among the fields. In each of the three highest-ranked fields - the life sciences, social sciences, and psychology. HEW obligated over 95 percent of the funds. Whereas NIH provided over three-fifths of the HEW support in the life sciences, OE and HSMHA were major contributors to the social sciences, accounting for 40 percent and 30 percent, respectively, of the $\$ 63$ million HEW total. Within psychology, 41 percent of the $\$ 41$ million total supported training in the biological aspects of psychology, largely sponsored by HSMHA, and 39 percent represented programs in the social aspects of psychology, funded primarily by SRS.

Engineering, which ranked fourth in field 5 percent of the 1971 fellowship and tram porters in this field were HEW and EPA respectively, of the total. While engineering percent of HEW's total traming support, EPA's training funds. AEC, DOT, and NAS efforts within engineering, allocating to thi: 47 percent ( $\$ 1.3$ million), and 98 percent totals for training programs.

Distribution of Federal obligations to un fellowships, traineeships, and training gra agency, FY 1971


SOURCE: Natıonal Science Foundation (CASE).
of training activities, over eships, and training grants el, the 1971 support level times the level of support y-eight percent ( $\$ 130$ mil, ship and traineeship pro-
ted support varied among ds - the life sciences, social 95 percent of the funds. EW support in the life scito the social sciences, aclively, of the $\$ 63$ million $\$ 41$ million total supportogy, largely sponsored by the social aspects of psy-

Engineering, which ranked fourth in field support, received $\$ 22$ million or 5 percent of the 1971 fellowship and training total. The two principal supporters in this field were HEW and EPA with 43 percent and 30 percent, respectively, of the total. While engineering funds accounted for less than 3 percent of HEW's total training support, they represented two-thirds of EPA's training funds. AEC, DOT, and NASA also concentrated their training efforts within engineering, allocating to this field 56 percent ( $\$ 1.5$ million), 47 percent ( $\$ 1.3$ million), and 98 percent ( $\$ 1.0$ million) of their respective totals for training programs.

Distribution of Federal obligations to universities and colleges for fellowships, traineeships, and training grants, by field of science and agency, FY 1971

Total: \$421.0 million


[^13]Next in order of funding were the physical sciences with 4 percent of the $\$ 421$ million training total. Obligations in this field a mounted to $\$ 16$ million, 59 percent of which was awarded by HEW and 36 percent by NSF. Training awards in the physical sciences accounted for the largest a mount of NSF support for any field.

Less than 4 percent of the 1971 funds supported training activities in the remaining two major fields, mathematics and the environmental sciences.

Some 8 percent of the 1971 obligations for fellowships, traineeships, and training grants was not allocable to a specific scientific discipline. Of the $\$ 34$ million in the "other sciences, n.e.c." category, nearly two-thirds represented NSF funds. NSF which reported 53 percent of its 1971 training total under this category could not predetermine the fields in which training would be undertahen at the time the traineeships were awarded, since the grantee institution determines in which department (field) students shall receive traineeship appointments.

## GEOGRAPHIC DISTRIBUTION

The distribution of Federal training support among the nine geographic divisions was virtually the same in 1971 as in 1970 with each division evidencing a 1970-71 proportional change of less then one percentage point. The Middle Atlantic, West North Central, East North Central, and New England divisions showed slight declines in their respective share, while all others had larger shares.

As in the 2 prior years, the Middle Atlantic led all other divisions with $\$ 83$ million, or 20 percent, of the 1971 training total. This divi،ion's 1971 funding level represents a 2-percent decline from the 1970 level. Ranking second was th East North Central division which received a total of $\$ 72$ million in 1971, 6 percent less than 1970, the largest regional decline. The Pacific and South Atlantic divisions accounted for the next largest proportions of training obligations with 16 percent and 14 percent, respectively, of the national total for this support category. Of the two, only the South Atlantic division evidenced a gain in the 1970-71 period with training funds to universities and colleges in this division increasing by 2 percent from 1970-71.

Because training support is highly tions receiving the largest amounts various divisions is determined to a l.a institutions located within a paticula terms of training funds also account institutıons, although rot necessarily the leading 100 un veisties and colle which comprise the four highest-ran

Since Ph.D. production induates there is a close relationship between received for fellowships, taineeships, of Ph.D. degrees confeired in the scie tween training obligations and Ph.D percentage points in all geographic di North Central division did not reflec only 17 percent of the 1971 Federal 22 percent of the Ph.D. degrees, $t^{\prime}$ geographic divisions.

Geographic distribution of $F$ fellowships, traineeships, and colleges compared to selected


WEST SOUTH CENTRAL

- Acanemic vea

SOURCE Nationsl Sciene, Foundat,cri ICASE
ences with 4 percent of the : ield amounted to $\$ 16$ milIV and 36 percent by NSF. d for the largest amount of
ted training activities in the environmental sciences.

Nlowships, traineeships, and ncientific discipline. Of the ry, nearly two-thirds reprent of its 1971 training total re fields in which training ips were awarded, since the ment (field) students shall

## ITION

among the nine geographic 970 with each division evithen one percentage point. t North Central, and New ir respective share, while all
led all other divisions with - total. This division's 1971 m the 1970 level. Ranking fich received a total of $\$ 72$ argest regional decline. The for the next largest propor14 percent, res pectively, of the two, only the South Atberiod with training funds to casing by 2 percent from

Because training support is highly conceritrated among the 100 institutions receiving the largest amounts of funds, the ranking postion of the various divisions is determ:ared to a large extent by the number of first 100 institutions located within a particular division. The four leading divisions in terms of training funds alsc accounted for the largest numbers of leading institutions, although not necessarily in the same rank order. Sixty-three of the leading 100 unversities and colleges were located in 19 of the 22 States which comprise the four highest-ranking divisions.

Since Ph.D. production indicates a capacity for research and training, there is a close relationship between the proportion of Federal obligations received for fellowships, traineeships, and training grants and the proportion of Ph.D. degrees conferred in the sciences and engineering. The variance between training obligations and Ph.D. degrees granted was no more than 3 percentage points in all geographic divisions but one. Institutions in the East North Central division did not reflect this close relationship. They received only 17 percent of the 1971 Federal training support, although they granted 22 percent of the Ph.D. degrees, the largest proportion among the nine geographic divisions.

Geographic distribution of FY 1971 Federal obligations for fellowships, traineeships, and training grants to universities and colleges compared to seiected educational and institutional data


Federal obligations to universities an traineeships, and training grants in th largest amounts, FY 1971
The 10 States leading in receipt of Federai training support for 1971 accounted for $\$ 250$ million, or nearly 60 percent of the national total for this support category. New York, California, and Massachusetts were the first three States, recerving as a group over 30 percent of the 1971 fellowship, traineeship, and training grant funds. New York, reflecting primarily NIH obligations to medical schools-11 of the Nation's 95 medical schools are located in this State-was granted a total of $\$ 53$ million, or 13 percent of the 1971 training funds. California, second to New York in number of medical schools with eight, was also second in training obligations, receiving $\$ 48$ million, or 1.5 times the level of third-ranked Massachusetts.

Only three of the leading 10 States registered increases between 1970 and 1971. Maryland experienced the largest gain among the top 10 States. The 1971 increase of 11 percent is mainly the result of a sizable increase in funds to Johns Hopkins University, the primary recipient among Maryland institutions. Also registering gains in 1971 were Pennsylvania and Texas with respective increases of 4 percent and 2 percent.

In many States, one or two individual institutions continue to account for the major share of Federal training support within the State. Harvard University and the Massachusetts Institute of Technology accounted for over 56 percent of the Massachusetts total. Seventy-t wo percent of the Federal training obligations to Maryland institutions went to Johns Hopkins Universtty. Similarly, Duke University and the University of North Carolina togethe: received nearly 80 percent of such funds for North Carolina.


SOURCE: National Science Foundation (CASE)

Federal obligations to universities and colleges for fellowships, traineeships, and training grants in the 10 States receiving the largest amounts, FY 1971
training support for 1971 acint of the national total for this Massachusetts were the first rcent of the 1971 fellowship, ork, reflecting primarily NIH tion's 95 medical schools are 3 million, or 13 percent of the w York in number of medic, al ing obligations, receiving $\$ 48$ hassachusetts.
ed increases between 1970 and among the top 10 States. The It of a sizable increase in funds pient among Maryland institunnsylvania and Texas with re-
utions continue to account for It within the State. Harvard I echnology accounted for over ty-two percent of the Federal ins went to Johns Hopkins - University of North Carolina h funds for North Carolina.

[^14]
## Institutional distribution

Between 1969 and 1971 the inumber of universities and colleges participating in federally supported iraining programs in the sciences and engineering increased by 64 percent from 485 to 795 (system offices excluded) while obligations for such programs decreased by 3 percent. This has resulted in a greater dispersion of funds among institutions. In these 3 years, the average amoliat of support awarded to institutions for training activities declined by si percent from $\$ 893,000$ per institution in 1969 to $\$ 527,000$ per institution in 1971.

Although each of the three lowest classes in terms of size of Federal training program evidenced an increase in the number of institutions, the most signiticant gain occurred in the lowest size class. The number of universities and colleges receiving less than $\$ 100,000$ nearly dnubled-from 274 in 1969 to 528 in 1971. Sixty-six percent of the recipients secured training fuitids totaling less than $\$ 100,000$ in 1971 compared to 56 percent in 1969.

> Number of universities and colieges receiving Federal obligations for fellowships, traineeships, and training grants ranked by size of Federal program, fiscal years $$
1969.71
$$

| Size of Federal program | 1969 |  | 1970 |  | 1971 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Number of institutons | Percent distribution | Number of institutions | Percent distribution | Number of instututions | Percent distribution |
| Total | 485 | 100.00 | 607 | i00.00 | 795 | 100.00 |
| \$10 million or more | 3 | . 62 | 2 | . 33 | 1 | . 13 |
| \$5 million to $\$ 9.9$ million. | 20 | 4.12 | 20 | 3.29 | 21 | 2.64 |
| \$1 milion to $\$ 4.9$ million | 79 | 16.29 | 79 | 13.01 | 75 | 9.43 |
| \$500,000 to \$999,000 | 37 | 7.63 | 49 | 8.0\% | 53 | 6.67 |
| S 000,000 to \$499,000 | 72 | 14.85 | 97 | 15.98 | 117 | 14.72 |
| Less than \$100,000 . . . . | 274 | 56.49 | 360 | 59.31 | 528 | 66.42 |

SOURCE• National Science Foundation (CASE).

The trend toward a wider dispersio and training grants was also reflected and colleges. The 100 highest-ranking $\$ 421$ million awarded in 1971 for fel percentage points less than in 1969.

Each of the sponsoring agencies funding within the group of 100 le degree. HEW awarded 83 percent ( $\$$ 100 institutions of higher educatio: percent and 63 percent, respectivel) funds to this group.

During the $1969-71$ period, the tions of higher education remained $r$ varied considerably. Of the 100 univ amounts of Federal fellowship and $t$ among the leading 100 in 1969 and 9

Many of the institutions that rank leading recipients in R\&D funding, nized research capabilities are also training science graduate students. terms of fellowship and traineeship terms of R\&D support. Furthermor training funds were among the 100 to

The principal recipients of funds training grants are also the princip leading 100 universities and college granted 75 percent of all Ph.D. degre ing during 1969-70 and 78 percen D.D.S. degrees). These degree-grant 100 institutions are slightly lower th port received by these institutions. I ber of the top-ranking institution advanced training are not necessarily Also, those institutions that are in their graduate programs would curre awarded than support received, since are awarded to graduate students at

## TRIBUTION

1 universities and colleges partic1 ams in the sciences and engineer5 (system offices excluded) while 3 percent. This has resulted in a ons. In these 3 years, the average for training activities declined by in 1969 to $\$ 527,000$ per institu-
. in terms of size of Federal trainnumber of institutions, the most se class. The number of univerO00 nearly doubled-from 274 in $f$ the recipients secured training compared to 56 percent in 1969.
deral obligations for fellowships,
,f Federal program, fiscal years

| 1970 |  | 1971 |  |
| :---: | :---: | :---: | :---: |
| riber of <br> ifutions | Percent <br> distribution | Number of <br> institutions | Percent <br> distribution |
| 607 | 100.00 | 795 | 100.00 |
| 2 | .33 | 1 | .13 |
| 20 | 3.29 | 21 | 2.64 |
| 79 | 13.01 | 75 | 9.43 |
| 49 | 8.07 | 53 | 6.67 |
| 97 | 15.98 | 117 | 1472 |
| 360 | 5931 | 528 | 6642 |

The trend toward a wider dispersion of funds for fellowships, traineeships, and training grants was also reflected in data for the leading 100 universities and colleges. The 100 highest-ranking institutions received 81 percent of the $\$ 421$ million awarded in 1971 for fellowships and other training programs, 5 percentage points less than in 1969.

Each of the sponsoring agencies concentrated their training program funding within the group of 100 leading institutions, but not to the same degree. HEW awarded 83 percent ( $\$ 300$ million) of its 1971 funds to these 100 institutions of higher education, whereas NSF and EPA a warded 69 percent and 63 percent, respectively, of their scientific manpower training funds to this group.

During the 1969-71 period, the composition of the leading 100 institutions of higher education remained relatively stable, although the rank order varied considerably. Of the 100 universities and colleges receiving the largest amounts of Federal fellowship and traineeship obligations in 1971, 93 were ameng the leading 100 in 1969 and 95 in 1970.

Many of the institutions that rank high in training support are among the leading recipients in R\&D funding, since academic institutions with recognized research capabilities are also those with the faculty and facilities for training science graduate students. Twelve of the leading 15 institutions in terms of fellowship and traineeship support ranked among the first 15 in terms of R\&D support. Furthermore, 78 of the 100 leading recipients of training funds were among the 100 top recipients of R\&D funds.

The principal recipients of funds for fellowships, traineeships, and other training grants are also the principal producers of advanced degrees. The leading 100 universities and colleges in terms of 1971 training obligations granted 75 percent of all Ph.D. degrees awarded in the sciences and engineering during 1969.70 and 78 percent of the medical doctorates (M.D. and D.D.S. degrees). These degree-granted percentages represented by the top 100 institutions are slightly lower than the 81 percent of total training support received by these institutions. This is partly due to the fact that a number of the top-ranking institutions chosen by fellowship awardees for advanced training are not necessarily the largest in terms of degrees granted. Also, those institutions that are in the process of developing or expanding their graduate programs would currently show a lower proportion of degrees awarded than support received, since there is a lapse between the time funds are awarded to graduate students and the time the degrees are conferred.

Federal obligations for fellowships, traineeships, and training grants to universities and colleges receiving the largest amounts


First 10 institutions


SOURCE: Natonal Science Foundation (CASE).

Within the group of 100 top-ranhins trolled universities and colleges received the total funds for fellowships and othe institutions in the top 100 awarded 48 sciences and engineering during 1969-7 institutions in this group, thete was a gh age of Ph.D. degrees awarded and the private institutions with a total of $\$ 157$ the total training funds, but only 27 pe in 1969-70.

Federal obigations to the 10 leading 1 during 1971, slightly more than one-1 total. Within the group of 10 leading total for training activities was awarded granted 9 percent of the $1969-70 \mathrm{Ph} . \mathrm{D}$ publicly controlled institutions in this $s$ training obligations and awarded 8 per ences and engineering during 1969-70.

Support to four of the leading 10 uni ing the previous fiscal year. While lower the overall declines registered by the $U$ University, a reduction in NSF fellow major factor in the funding decreases $f$ University. The six other leading instite port in 1971, particularly Johns Hophii million in 1970 to $\$ 8.8$ million in 1971 Johns Hopkins' increase is attributable training grant obligations in the life scien

For the third consecutive year, Harvar recipient of Federal fellowship and trair of $\$ 11$ million, 6 percent below the amd also the leading HEW recipient, receivin four-fifths of the institution total.
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Millions of dollars)


Within the group of 100 top-ranking institutions, the 60 publicly controlled universities and colleges received $\$ 183$ million in 1971, 44 percent of the total funds for fellowships and other training grants. In addition, public institutions in the top 100 awarded 48 percent of the Ph.D. degrees in the sciences and engineering during 1969-70. For the 40 privately controlled institutions in this group, there was a greater variation between the percentage of Ph.D. degrees awarded and the percentage of funds received. The private institutions with a total of $\$ 157$ million accounted for 37 percent of the total training funds, but only 27 percent of the Ph.D. degrees conferred in 1969.70.

Federal obligations to the 10 leading institutions amounted to $\$ 90$ million during 1971, slightly more than one-fifth of the fellowship and training total. Within the group of 10 leading universities, 13 percent of the 1971 total for training activities was awarded te the six private institutions which granted 9 percent of the 1969-70 Ph.D. degrees. By comparison, the four publicly controlled institutions in this group received 9 percent of the total training obligations and awarded 8 percent of the Ph.D. degrees in the sciences and engineering during 1969-70.

Support to four of the leading 10 universities was !ower in 1971 than during the previous fiscal year. While lower HEW levels primarily contributed to the overall declines registered by the University of Michigan and Columbia University, a reduction in NSF fellowship and traineeship support was a major factor in the funding decreases for Harvard University and Stanford University. The six other leading institutions received increased dollar sup. port in 1971, particularly Johns Hopkins University, which rose from $\$ 7.8$ million in 1970 to $\$ 8.8$ million in 1971, a 13 -percent gain. Virtually all of Johns Hopkins' increase is attributable to a $\$ 1$ million increase in HEW training grant obligations in the life sciences.

For the third consecutive year, Harvard University was the highest-ranking recipient of Federal fellowship and traineeship obligations with a 1971 total of $\$ 11$ million, 6 percent below the a mount reported for 1970. Harvard was also the leading HEW recipient, receiving $\$ 9$ million from this agency, over four-fifths of the institution total.

## General Support for Science

## AGENCY DISTRIBUTION

During 1971 \$ 100 million was awarded by the Federal Government to universities and colleges for programs designed to strengthen or enlarge institutional capabilities for research and science education. These "general support for science" programs are sponsored principally by the National Science Foundation and the Department of Health, Education, and Welfare. In 1971 these two agencies provided 97 percent of the general support for science funds with respective shares of 57 percent and 40 percent. The remaining 3 percent was obligated by the Departments of Commerce, Interior, and Labor.

General support for science programs administered by NSF in 1971 included the Institutional Grants for Science Program (formula grants) and the Science Development Program as well as the College Science Improvement Program and Cooperative College-School Science Program. In 197I NSF funds to institutions of higher educa-

Federal obligations to universities and colleges for general support for science, by agency


SOURCE• National Seience Foundation (CASE).
tion for general support activities totaled $\$ 57$ million, a slightly lower level than in 1970. This decrease in funding reflects the gradual phasing out of the Science Development Programby the Foundation; however, the impact of this action on NSF's level of funding will be more evident in subsequent fiscal years.

HEW's general support for science program which is limited to awards by the National Instilutes of Health is composed of three elenments: General iesearch support, biomedical sciences support, and health sciences advancement awards. In 1971 NIH distributed $\$ 40$ million to academic institutions, primarily health professional schools, for the general support of science. The 1971 level of NIH funding for these activities represented a 7 -percent decrease from 1970.

## GEOGRAPHIC DISTRIBUTION

Academic institutions in the Middle Atlantic division were the leading recipients of general support for science funding in 1971 with $\$ 20$ million, one-fifth of the total for this category of support. This division received a similar share of R\&D and fellowship and training funds, 18 percent and 20 percent, respectively. The other geographic divisions, however, showed a lesser degree of comparability among the three academic science categories reflecting the greater regional dispersion of funds for institutional development activities.

The higher ranking divisions in terms of R\&D and training support received proportionately smaller amounts of general support funds than R\&D and training funds. Universities and colleges in New England, for example, accounted for only 8 percent ef the 1971 general support for science total as compared with 14 paicent and 10 percent, respectively, of total R\&D and training support. Similarly, the Pacific division received 20 percent and 16 percent, accordingly, of R\&D and training obligations, but less than

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The higher ranking divisions in terms of R\&D ind training support received proportionately , maller amounts of general support funds than R\&D and training funds. Universities and colleges in New England, for example, accounted for only 8 percent of the 1971 general support for science total as compared with 14 percent and 10 percent, respectively, of total R\&D and rraining support. Similarly, the Pacific division received 20 percent and 16 percent, accordingly, of R\&D and training obligations, but less than

15 percent of the general support for science obligations. Conversely, the lower ranking divisions accounted for a significantly higher proportion of general support for science funds than either R\&D or training funds. Together, the West Soutl Central, the West North Central, the Mountain, and the East Eouth Central divisions accounted for 29 percent of the 1971 general support for science total while accounting for only 21 percent of the total funding for research and development and 22 percent of the funding for fellowships, traineeships, and other training activities.

Fifty-four percent of the 1971 general support for science funds was distributed to the 10 States receiving the largest amounts, ranging from $\$ 10$ million for New York to less than $\$ 3$ million for Wisconsin.

## Geographic distribution of Federal obligations to universities and colleges for general support for science, FY 1971



## INSTITUTIONAL DISTRIBUTION

During 197; Federal funds for the general support of science were distributed to 714 aca demic institutions and 13 system offices. Of the 714 recipient institutions, 689 rece:ved general support for science awards from NSF and 161 were awarded NIH general research support grants. Although general support for science programs have, as one of their objectives, the attainment of a wider institutional distribution of support, those sponsored by NIH are restricted to fewer participants than those of the Foundation because (1) the NIH General Research Support Grants Program (the main component of this agency's general support pro: gram) provides awards only to institutions which received over $\$ 100,000$ in NIH and NIMH research grants in the preceding year and (2) grants are awarded primarily to medical and other health professional schools which are limited in number. During 1971 four-fifths ( $\$ 32$ million) of the NIH total for this type of support was allocated to health professional schools.

The 100 universities and colleges receiving the largest amounts of general support for science funds accounted for 85 percent ( $\$ 34$ million) and 71 percent ( $\$ 40$ million) of ivilH and NSF general support obligations, respectively. The share of NSF support represented by the first 20 institutions was, however, double that of NIH 44 percent as compared with 22 percent.

In terms of individual institutions, 14 universities and colleges received in excess of $\$ 1$ million from the Foundation, while only two instilutions were awarded that amount by NIH. Ranking first in terms of NSF support with \$2 million was Carnegie Mellon University which ranked seventh in total support, while Duke University, 19th in total support, was the largest NIH recipient with $\$ 1$ million.

Distribution of NSF and HEW(NIH) obligations for general support for science to the 100 universities and colleges receiving the largest amounts,


SOURCE: National Science Fournlation (CASE).

# Facilities and Equipment for Instruction in Science and Engineering 

## AGENCY DISTRIBUTION

Federal support for instructional facilities in the sciences and engineering totaled $\$ 29$ million in 1971. Obligations by the Office of Education, the only HEW component to report funds under this support category, amounted to $\$ 14$ million, 48 percent of the total. OE's science construction and facilities improvement funds which are authorized under Title I of the Higher Education Facilities Act are directed predominantly to developing academic institutions, many of which are two-year community colleges and technical institutes.

During 1971 NSF the second major supporting agency awarded $\$ 12$ million, or 42 percent of the total, to universities and colleges for instructional science facilities and equipment. In contrast to OE's more broadly based facilities funds, NSF funds allocated for this purpose mainly financed ship operations and oceanographic laboratories. NSF's oceanographic facilities support grants which totaled 510 million in 1971 enable academic institutions to expand their existing oceanographic research and training programs and to develop new programs. Although these facilities serve two interrelated purposes, research and training, they are, in actuality, utilized primarily for oceanographic research. Since funds could not be apportioned between research and instruction, the amount reported by NSF in 1971 under the "facilities and equipment for instruction" category is overstated. Also included in the 1971 NSF total for this category were awards to 19 institutions of higher education totaling $\$ 2$ million for computer facilities projects.

The remaining three agencies funding science facilities projects in 1971-AEC, USDA, and Interior - obligated a combined iutal of iess than $\$ 3$ million. Of that amount, over $\$ 2$ million represented AEC funds. Eighty-seven percent of AEC's $\$ 2.3$ million total for instructional facilties was obligated to the University of Pueito Rico System Office for construction a: the Pueito Rico Nuclear Center.

## GEOGRAPHIC DISTRIBUTION

The greatest NSF concentration geographically was in the Pacific division where the majority of ship-operator academic institutions are located. Obligations to institutions in this division amounted to $\$ 5$ million, 46 percent of NSF's science education facilities funds. The South Atlantic and New England divisions, both coastal divisions, also received sizable proportions of NSF support - 20 percent and 18 percent, respectively, of the total.

Federal obligations to universities and colleges for facilities and equipment for instruction in science and engineering, by agency, FY 1971


SOURCE• National Scrence Foundation (CASE).

Educatic counted f facılities su to univers lantic, Eas divisions 16 peicent cumsiauct: science fac division su primarily University

In term individual pattern ief facility pr category. among a $f$ the total 1 support an by the leas ties and co structional ported onl were shipthree top-ı and as wel California, ic Institutic counted fr Foundatior These thie ships curre

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The remaining three agencies funding science facilities propects in 1971 - AEC, USDA, and Interior - obligated a combined total of less than $\$ 3$ million. Of that amount, over $\$ 2$ million represented AEC funds. Eighty-seven percent of AEC's $\$ 2.3$ million total for instructional facilities was obligated to the University of Puerto Rico System Office for construction at the Puerto Rico Nuclear Center.

## GEOGRAPHIC DISTRIBUTION

The greatest NSF concentration geographically was in the Pacific division where the majority of ship-operator academic institutions are located. Obligations to institutions in this division amounted to $\$ 5$ million, 46 percent of NSF's science education facilities funds. The South Atlantic and New England divisions, both coastal divisions, also received sizable proportions of NSF support - 20 percent and 18 percent, respectively, of the total.


SOURCE National Science Foundation (CASE).

Educational institutions in the Pacific accounted for only 6 percent of OE's science facilities support. OE funds were largely directed to universities and colleges in the Middle Atlantic, East North Central, and South Atlantic divisions which received, in order, 22 percent, 16 percent, and 15 percent of OE's total science construction obligations. Over one-half of OE's science facilities funds in the Middle Atlantic division supported institutions in New York, primarily community colleges under the State University of New York System.

## INSTITUTIONAL DISTRIBUTION

In terms of degree of concentration and individual recipient, the institutional funding pattern reflects differences in the type of agency facility program classified under this support category. NSF funds were highly concentrated among a few institutions as indicated by both the total number of institutions receiving NSF support and the proportion of support received by the leading institutions. Of the 456 universities and colleges receiving Federal funds for instructional facilities and equipment, NSF supported only 43 institutions, eighteen of which were ship-operator institutions. Moreover, the three top-ranking institutions in terms of total and as well as NSF support - the University of California, San Diego Woods Hole Oceanographic Institution, and the University of Miami - accounted for 43 percent ( $\$ 5$ million) of the Foundation's 1971 science facilities funds. These three institutions operate 12 of the 32 ships currently supported by NSF.
OE's science facilities and equipment support, on the other hand, was distributed a mong 406 universities and colleges. The largest OE award for construction and improvement of instructional science facilities in 1971 was one of $\$ 900,000$ to Tompkins-Cortlarid Community College (SUNY), three times the amount granted to the next highest ranked OE recipient, Cuyahoga Community College.

## Section 3. FEDERALLY FUNDED RESEARCH AND DEVELOPMEN ADMINISTERED BY UNIVERSITIES AND COLLEGES

Six Federal agencies allocated $\$ 984$ million to 31 academically associated Federally Funded Research and Development Centers (FFRDC's) in fiscal year 1971. Although overall Federal support increased by $\$ 23$ million, less than one-half (15) the total number of FFRDC's received more funding in 1971 than in 1970.

## Agency Distribution

AEC continues as the principal Federal agency in the funding of academically associated FFRDC's, with 64 percent of the Federal total. NASA and DOD awarded $\$ 312$ million, or 32 percent of the total. All other agencies (primarily NSF and HEW) represented 5 percent of total funding in 1971. Their proportion of the total, however, was up from 4 percent in 1970, primarily because of a $\$ 10$ million increase in NSF support.

R\&D plant support amounted to nearly 19 percent of all Federal funding at FFRDC's, compared to only 1 percent at universities and colleges. Of the $\$ 185$ million in Federal R\&D plant funds to FFRDC's, 92 peicent came from AEC. The R\&D programs of AEC require large facilities and equipment, such as the 200 -Bev proton synchrotron at the National Accelerator Laboratory in Illinois. This one facility, whose total cost is $\$ 250$ miliion, spread over à 5 -year period, received $\$ 85$ million in 1971 R\&D plant funding.

Federal obligations to Federal administered by universities

| Agency |  |
| :---: | :---: |
| Total, all agencies. |  |
| Atomic Energy Commission. |  |
| Department of Defense |  |
| Department of the Navy. . . Department of the Air Force |  |
| Department of Health. Education, and Welfare |  |
| National Instututes of Health Office of Education |  |
| Department of Housing and Urban Development |  |
| National Aeronautics and Space Ad ministration |  |
| Natonal Science Foundation |  |

SOURCE National Science Foundation (

## FUNDED RESEARCH AND DEVELOPMENT CENTERS ERED BY UNIVERSITIES AND COLLEGES

million to 31 academically associated lopment Centers (FFRDC's) in fiscal upport increased by $\$ 23$ million, less of FFRDC's received more funding in
teral agency in the funding of academ. eicent of the Federal total. NASA and ereent of the total. All other agencies d 5 percent of total funding in 1971. ver, was up from 4 percent in 1970 , iease in NSF support. early 19 percent of all Federal funding cent at universities and colleges. Of the funds to FFRDC's, 92 percent came EC require large facilities and equip. inchrotron at the National Accelerator liy, whose total cost is $\$ 250$ million, \$85 million in 1971 R\&D plant fund-

Federal obligations to Federally Funded Research and Development Centers adminıstered by universities and colleges, by agency and type of prng:am, fiscal year 1971
[Dollars in thousands)

| Agency | Total Federal obligations | Research and development | R\&D plant | Other science activities |
| :---: | :---: | :---: | :---: | :---: |
| Total, all agencies <br> Atomic Energy Commission. Department of Defense . . . . . <br> Department of the Navy Department of the Air Force <br> Department of Healtr, Education, and Welfare <br> National Institutes of Health Office of Education <br> Department of Housing and Urban Development . . . . . . . . . . . <br> National Aeronautics and Space Administration <br> National Scrence Foundation | \$984,001 | \$794.874 | \$184.709 | \$4.418 |
|  | 626,621 | 452,816 | 169,659 | 4,146 |
|  | 137,086 | 137,086 |  |  |
|  | 81,980 | 81,980 |  |  |
|  | 55,106 | 55,106 |  |  |
|  | 7.427 | 7.155 | . . . . . . . | 272 |
|  | 709 | 437 | . . . . . . . | 272 |
|  | 6,718 | 6,718 |  |  |
|  | 550 | 550 |  | -••••• |
|  | 175,077 | 164,517 | 10.560 |  |
|  | 37.240 | 32.750 | 4.490 | . . |

[^15]Federal obligations to Federally Funded Research and Development Centers admınistered by unıversities and colleges, fiscal years
[Dollars in thousands]

| State and Institution | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Total <br> Arizona. | \$814,082 | \$862,353 | \$895,287 | \$917,631 | \$907.549 | \$935,820 | \$916,872 | \$960,906 | \$984,001 |  |
| Cerro Tololo Inter.American Observatory (Chile) ${ }^{\text {a }}$ | 1,100 | 1,100 | 1,465 | 1,471 | 1.713 | 2,325 | 4,550 | 1,900 | 2.200 | NSF |
| Kıtt Peak National Observa. tory ${ }^{\text {a }}$ | 3,750 | 4,400 | 6,915 | 5,791 | 5.485 | 12,475 | 5,700 | 6.400 | 7.200 | NSF |
| California. |  |  |  |  |  |  |  |  |  |  |
| Center for Research and De. velopment in Higher Education |  |  |  |  | 849 | 1,459 | 938 | 879 | 718 | HE |
| Center for the Study of the Evalug:iun of Instruc. tional Program |  | ....... | - ........ |  | 534 | 868 | 809 | 648 | 572 | HE |
| Jet Propulsion Ldooratory ${ }^{\text {b }}$ | 230,168 | 226,194 | 245,094 | 230,091 | 222.169 | 206,074 | 156,295 | 180,047 | 173,360 | NAS |
| Lawrenice Laboratories. | 162,854 | 169,424 | 156,254 | 169,870 | 174,661 | 184,500 | 179,185 | 187.686 | 176,861 | AEC |
| Stanford Center for Research and Development in Teaching $\qquad$ |  |  |  |  | 797 | 1,597 | 5,007 | 928 | 928 | HE |
| Stanford Linear Accelerator Center | 16,193 | 24,122 | 43,943 | 50,969 | 30,891 | 28,996 | 31,001 | 27.051 | 29,046 | AE |
| Colorado. |  |  |  |  |  |  |  |  |  |  |
| National Center for Atmos. pheric Research ${ }^{\text {a }}$ | 6,019 | 10,036 | 8,94i | 11.791 | 16,576 | 14,679 | 14,061 | 11,414 | 15.200 | NSF |
| District of Columbia. Center for Research in Social Systems ${ }^{\text {c }}$ | 941 | 934 | 1.843 | 1.808 | 1,936 | 1,618 | 1,861 | 620 |  | DO |
| Georgia: |  |  |  |  |  |  |  |  |  |  |
| Research and Development Center in Educat:onal Stimulation ${ }^{\text {c }}$. |  |  |  |  | 732 | 1,294 | 809 | 339 |  | HEV |
| Illinors: |  |  |  |  |  |  |  |  |  |  |
| Argonne Natıonal Labo. ratory ${ }^{\text {d }}$ | 74,947 | 84,507 | 86,329 | 87.255 | 97,262 | 113.178 | 112,874 | ;04,187 | 105,38\% | AE |
| Coordination Center for the National Program in Early Childhood Education ${ }^{\text {c }}$. . |  | $\ldots$ | ......... |  |  | 1,552 | 1,723 | 473 |  | HEV |
| National Accelerator Labo. ratory ${ }^{3}$ |  |  |  |  |  | 3,377 | 14,763 | 49,527 | 94,219 | AE |
| lowa: |  |  |  |  |  |  |  |  |  |  |
| Ames Laboratory | 6,549 | 7,360 | 8,464 | 9,089 | 9,371 | 9,891 | 8,886 | 8,885 | 8.111 | AE |


| $t_{9}$ |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| years | rally Funde | Research and | Developme <br> \| Dollars | Centers ad <br> thousands | Istered by | iversities and | colleges, fis | years 1963.71 |  |
| Sp ${ }^{6}$ | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | Sponsoring Agency | Admınıstered by |
| 2,353 | \$895.287 | \$917.631 | \$907,549 | \$935,820 | \$916,872 | \$960,906 | \$984,001 |  |  |
| $\begin{aligned} & \text { NSF } \\ & \text { NSF } \\ & .100 \\ & .400 \end{aligned}$ | 1.465 6.915 | 1.471 5,791 | 1,713 5,485 | 2,325 12,475 | 4,550 5,700 | 1,900 6,400 | 2,200 7,200 | NSF NSF | Association of Universities for Research in Astronomy, Inc Association of Universities for Research in Astronomy, Inc. |
| HEV | ....... | ........ | 849 | 1.459 | 938 | $8^{79}$ | 718 | HEW (OE) | University of Cahifornia |
| HEV ... |  |  | 534 | 868 | 809 | 648 | 572 | HEW (OE) | University of California |
| NAS $\quad .194$ | 245,094 | 230,091 | 222,169 | 206,074 | 156,295 | 180,047 | 173,360 | NASA | California Institute of Technology |
| AEC : 424 | 156,254 | 169,870 | 174,661 | 184,500 | 179,185 | 187,686 | 176,861 | AEC | University of California |
| HEV | ........ |  | 797 | 1,597 | 5,007 | 928 | 928 | HEW (OE) | Stanford University |
| AEC . 122 | 43,343 | 50,969 | 30,891 | 28,996 | 31,001 | 27,051 | 29,046 | AEC | Stanford University |
| NSF 1.036 | 8,941 | 11,791 | 16,576 | 14,679 | 14,061 | 11,414 | 15,200 | NSF | University Corporation for Atmos. pheric Research |
| DOd 934 | 1,843 | 1,808 | 1,936 | 1,618 | 1,861 | 620 | ... $\cdot$. | DOD (Army) | American University |
| HEV |  |  | 732 | 1,294 | 809 | 339 | $\ldots$ | HEW (OE) | University of Georgia |
| AEC 507 | 86,323 | 87,255 | 97,262 | 113.178 | 112,874 | 104,187 | 105,387 | AEC | University of Chicago and Argonne Universities Association |
| HEV | ......... | ........ | -........ | 1,562 | 1,723 | 473 | . . . . . . . | HEW (OE) | University of llinois |
| AEO | ........ |  | . ........ | 3,377 | 14,763 | 49,527 | 94.219 | AEC | University Research Association |
| AEO 360 | 8,464 | 9,089 | 9,371 | 9,891 | 8,886 | 8,885 | 8.111 | AEC | Iowa State University of Science and Technology |

Federal oblıgations to Federally Funded Research and Development Centers administered by universities and colleges, fisc
[Dollars in thousands)

| State and Institution | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Maryland |  |  |  |  |  |  |  |  |  |
| Applied Physics Laboratory | 42,096 | 49.124 | 54,097 | 52,491 | 47.172 | 49.719 | 51.218 | 53,444 | 62,90 |
| Center for the Study of Social |  |  |  |  |  |  |  |  |  |
| Organization of Schools and the Learning Process. |  |  |  |  |  | 742 | 620 | 650 | 33 |
| Massachusetts: |  |  |  |  |  |  |  |  |  |
| Cambridge Electron Accelerator ${ }^{\mathrm{e}}$ | $\{5.946$ |  |  | $6.130$ | 6.786 \} | 4,778 | 4.849 | 4.412 | 2.88 |
| Center for Research and | 2,632 | 3,424 |  |  | 3.596 |  |  |  |  |
| Development in Educa. |  |  |  |  | 1165 |  |  | ...... |  |
| tional Differences ${ }_{\text {coln }}$ Lincoln Laboratory . . . | 70,606 | 78,764 | 68.683 | 64,060 | 66,989 | 62,319 | 61,379 | 55.648 | 57.1 |
| New Jersey. |  |  |  |  |  |  |  |  |  |
| Plasma Physics Laboratory . | 7.542 | 8.268 | 6,997 | 6,556 | 6.572 | 7.446 | 7,796 | 7.680 | 8,2 |
| Princeton-Pennsylvania Ac. celerator ${ }^{\mathrm{e}}$ | \{ 6.224 | 5.500 | 7,521 | 8,825 | 7.971 |  |  |  |  |
|  | $\left\{\begin{array}{l}881\end{array}\right.$ | 1.790 | 1,982 | 1,801 | 1,775 $\}$ | 6,422 | 6.461 | 5.090 | . 0 |
| New Mexico |  |  |  |  |  |  |  |  |  |
| Los Alamos Scientific Laboratory. | 93.020 | 97.680 | 94,636 | 103,311 | 102.213 | 109,387 | 114,698 | 140,914 | 130.71 |
| New York: |  |  |  |  |  |  |  |  |  |
| Brookhaven National Laboratory ${ }^{\text {a }}$ | 59,180 | 58,619 | 63,564 | 64,407 | 64,160 | 66,814 | 74,995 | 72,660 | 65.6 |
| Hudson Laboratory ${ }^{\text {c }}$ | 3,780 | 3.939 | 4.195 | 4.673 | 4,708 | 4.800 | 3.080 | ......... |  |
| Oregon: |  |  |  |  |  |  |  |  |  |
| Center for the Advanced Study of Educational Administration .. |  | 509 | 534 | 663 | 676 | 590 | 519 | 596 | 4 |
| Pennsylvania |  |  |  |  |  |  |  |  |  |
| Learning Research and De. velopment Center |  |  | 754 | 642 | 1,309 | 1,465 | 7,083 | 1.465 | 1.5 |
| Ordnance Research Labo. ratory | 3,763 | 4.827 | 7.025 | 9.597 | 8.120 | 9,371 | 8.577 | 8.412 | 7,88 |
| Puerto Rico: National Astronomy and lonosphere Center ${ }^{\text {f }}$ |  |  |  |  |  |  |  | 2,106 | 5,8 |
| Tennessee: |  |  |  |  |  |  |  |  |  |
| Oak Rıdge Associated Unıversittes ${ }^{\text {a }}$ | 4.291 | 5.059 | 5,695 | 6,168 | 5,620 | 4.770 | 5.276 | 5.179 | 5,1 |

ally Funded Research and Development Centers administered by universities and colleges. fiscal years $\mathbf{1 9 6 3 . 7 1}$ (cont.)
[Dollars in thousands]

| 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | Sponsoring Agency | Administered by |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 54.097 | 52,491 | 47.172 | 49.719 | 51.218 | 53.444 | 62,908 | DOO (Navy) | Johns Hopkıns University |
|  |  |  | 742 | 620 | 650 | 332 | HEW (OE) | Johns Hopkıns University |
| 5,851 3,792 | 6,130 3,517 | $\left.\begin{array}{l} 6,786 \\ 3,596 \end{array}\right\}$ | 4.778 | 4.849 | 4.412 | 2,886 | AEC | Harvard University <br> Massachusetts Institute of Technology |
| ......... | 1.112 | 1.165 | . . . . ${ }^{\text {a }}$ | ...... | . . . . . . | ........ | HEW (OE) | Harvard University |
| 68,683 | 64.060 | 66,989 | 62,319 | 61,379 | 55,648 | 57.116 | DOD <br> (Aur Force) | Massachusetts Institute of Technology |
| 6,997 | 6,556 | 6,572 | 7.446 | 7.796 | 7.680 | 8.211 | AEC | Princeton University |
| 7,521 1,982 | 8,825 1,801 | $\left.\begin{array}{l}7.971 \\ 1.775\end{array}\right\}$ | 6.422 | 6,461 | 5,090 | 2,010 | AEC | Princeton University University of Pennsylvania |
| 94,636 | 103.311 | 102.213 | 109.387 | 114.698 | 140,914 | 130.716 | AEC | University of California |
| 63.564 4.195 | 64.407 4.673 | 64.160 4.708 | 66,814 4,800 | 74,995 3,080 | 72,660 | 65,614 | AEC <br> DOD (Navy) | Associated Universities, Inc. Columbia University |
| 534 | 663 | 676 | 590 | 519 | 596 | 485 | HEW (OE) | University of Oregon |
| 754 | 642 | 1.309 | 1.465 | 7.083 | 1.165 | 1,509 | HEW (OE) | University of Pittsbeargh |
| 7.025 | 9,597 | 8,120 | 9.371 | 8.577 | 8,412 | 7.884 | OOD (Navy) | Pennsylvanir. State University |
|  |  |  |  |  | 2,106 | 5,800 | NSF | Cornell University |
| 5,695 | 6,168 | 5,620 | 4.770 | 5.276 | 5.179 | 5.138 | AEC | Oak Ridge Associated Universities |

Federal obligations to Federally Funded Research and Development Centers administered by universities and colleges, fiscal years
[Dollars in thousands]

| State and Institution | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Texas: |  |  |  |  |  |  |  |  |  |  |
| Research and Development |  |  |  |  |  |  |  |  |  |  |
| Center in Teacher Education. | $\ldots$ |  |  |  | 763 | 1,190 | 820 | 656 | 671 | H |
| Virgınia: |  |  |  |  |  |  |  |  |  |  |
| Center for Naval Analyses . . | $\ldots . .$. | $\ldots$ | $\cdots \cdot \cdots \cdot$ | . $\cdot$. $\cdot$. | ......... | 8,838 | 9,218 | 9,085 | 7.688 | D |
| Human Resources Research |  |  |  |  |  |  |  |  |  |  |
| Organızation9 ...... | 2.794 | 3,081 | 3,382 | 2,752 | 2,853 | 1,645 | 3,445 | ........ |  | D |
| oratory |  |  |  | 729 | 1.815 | 586 | 1.213 | 865 | 1,371 | $N$ |
| Washington: |  |  |  |  |  |  |  |  |  |  |
| Applied Physics Laboratory | 3,200 | 2.275 | 2,178 | 5.145 | 2.836 | 3.192 | 3.205 | 2.682 | 1.957 | D |
| West Virginia: |  |  |  |  |  |  |  |  |  |  |
| National Radio Astro:omy |  |  |  |  |  |  |  |  |  |  |
| Observatory ${ }^{\text {a }}$. . . . | 4,550 | 4,600 | 3,380 | 4.719 | 5,062 | 4.865 | 7.278 | 5.800 | 6.400 | $N$ |
| Wisconsin: |  |  |  |  |  |  |  |  |  |  |
| Army Mathematıcs Researsh |  |  |  |  |  |  |  |  |  |  |
| Center ${ }^{\text {c }}$. . . . . . . | 1.050 | 1.100 | 1,273 | 1,390 | 1,378 | 1,300 | 1,350 | 1.280 | $\ldots . .$. | D |
| Center for Research and De velopment for Learning |  |  |  |  |  |  |  |  |  |  |
| and Re-education |  |  | 500 | 808 | 1,034 | 1,688 | 5,330 | 1,298 | 1.503 | H |

One of seven centers administered by university consortia.
${ }^{6}$ Includes sizeable amounts subcontracted, principally to industrial firms.
${ }^{\text {CNot an FFRDC in }} 1971$.
${ }^{d}{ }^{\text {Administered by both university and consortium. }}$
${ }^{\circ}$ Figures for 1968.71 were reported on a somewhat different basis than figures for 1963.67.
fthis center (formerly known as Arecibo Observatory Science Foundation assumed responsibility for ir institution.
9 FFRDC status changed from 'university administe institution are included in part il, section 2 SOURCE: National Science Foundation (CASE).

Federally Funded Research and Development Centers administered by universities and colleges, fiscal years $1963-71$ (cont.)
[Dollars in thousands]

| 8 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | Sponsoring Agency | Administered by |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | -•••••• |  | 763 | 1,190 | 820 | 656 | 671 | HEW (OE) | University of Texas |
| $\cdots$ | -••••••• | -*..... |  | 8,838 | 9.218 | 9,085 | 7.688 | DOD (Navy) | University of Rochester |
| 081 | 3,382 | 2.752 | 2,853 | 1,645 | 3.445 |  | ........ | DOD (Army) | George Washıngton University |
| -•• | $\cdots \cdot .$. | 729 | 1,815 | 586 | 1.213 | 865 | 1.371 | NASA | College of William and Mary |
| 275 | 2.178 | 5.145 | 2,836 | 3.192 | 3.205 | 2,682 | 1.957 | DOD (Navy) | University of Washington |
| 600 | 3,380 | 4.719 | 5,062 | 4,865 | 7.278 | 5.800 | 6.400 | NSF | Associated Universities, Inc. |
| 100 | 1.273 | 1.390 | 1,378 | 1,300 | 1,350 | 1,280 |  | 000 (Army) | University of Wisconsin |
| * | 500 | 808 | 1.034 | 1,688 | 5,330 | 1,298 | 1.503 | HEW (OE) | University of Wisconsin |
| industrial firms. |  |  |  | f This center (formeriy known as Arecibo Observatory) became an FFRDC in 1970 when the National Science foundation assumed responsibility for the support of the research programs of this institution. |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| different basis than figures for 1963.67. |  |  |  | 9FFRDC status changed from "university administered" to "nonprofit administered", data for this institution are included in part 11 , section 2. |  |  |  |  |  |

## Institutional Distribution

Eight centers, little more than one-fourth the total number, accounted for nearly nine-tenths of total FFRDC support from Federal agencies in 1971. Five of these centers are under contract to AEC (Lawrence Laboratories, Los Alamos Scientific Laboratory, Argonne National Laboratory, National Accelerator Laboratory, and Brookhaven National Laboratory), two are sponsored by DOD (Applied Physics Laboratory and Lincoln Laboratory), and one is funded by NASA (Jet Propulsion Laboratory).

Federal funding is becoming increasingly concentrated among FFRDC's. The first 10 institutions accounted for 88 percent of total funding in 1969 , 92 percent in 1970, and 93 percent in 1971. This trend is primarily attributable to the growing role of the larger centers in the high-energy physics programs. In each of the last 3 years AEC placed six centers among the leading 10 recipients of Federal support. These six institutions accounted for 58 percent, 61 percent, and 61 percent of all Federal support to all FFRDC's and 94 percent, 95 percent, and 96 percent of all AEC support in 1969, 1970, and 1971, respectively. Moreover, the total number of academically associated FFRDC's reported as receiving Federal funding went down from 35 in 1970 to 31 in 1971.

The Lawrence Laboratories for the third consecutive year led all other FFRDC's in total funding, with $\$ 177$ million in 1971.4 Another California FFRDC, Jet Propulsion Laboratory ranked a close second with $\$ 173$ million in 1971.

The largest increase was posted by the National Accelerator Laboratory, up $\$ 45$ million, or 90 percent, over the 1970 level. The size of the NA.L. funding increase ( $\$ 45$ million) from 1970.71 was nearly twice as much as all other increases combined.

Many FFRDC's, such as Brookhaven National Laboratory, Oak Ridge Associated Universities, the National Radio Astronomy Observatory, and Kitt Peak National Observatory, provide research, educational, and training opportunities beyond those available at universities. Some cooperative programs include: (1) faculty participation in projects at the centers to learn the latest research techniques, which are then applied to academic research projects upon return to their universities; (2) postdoctoral fellowships, with specific reference to those who plan on entering the teaching profession; and, (3) graduate fellowships whereby graduate students may use unique facilities to carry out doctoral research programs.

[^16]Concentration of Federal obligatio by universities and culliges, FY 19


SOURCE: National Science Foundation (CAS
he total number, accounted for from Federal agencies in 1971. AEC (Lawrence Laboratories, National Laboratory, National Vational Laboratory), two are fitory and Lincoln Laboratory), .aboratory).
concentrated among FFRDC's. ercent of total funding in 1969, This trend is primarily attribut, in the high-energy physics pro?d six centers among the leading institutions accounted for 58 ederal support to all FFRDC's it of all AEC support in 1969, ce total number of academically -deral funding went down from
: consecutive year led all other on in 1971. ${ }^{4}$ Another California , close second with $\$ 173$ million
-ational Accelerator Laboratory, 970 level. The size of the NAL I was nearly twice as much as all
ational Laboratory, Oak Ridge (o) Astronomy Observatory, and carch, educational, and training versities. Some cooperative proprojects at the centers to learn en applied to academic research 2) postdoctoral fellowships, with ntering the teaching profession; Juate students may use unique dms.
. Id tor the Laermore and Bethele) Iabora.

Concentration of Federal obligations to FFRDC's administered by universities and colleges, FY 1971

- [Percent of Federal obligations]


[^17]Federal obligations to Federally Funded Research and Development Centers administered by universities and colleges, by State, institution, and type of program. fiscal vear 1971
[Dollars in thousands)

| State and institution | Agency | Total Federal obligations | Research and development | R\&D plant | Other science activities |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Total |  | \$984.001 | S794,874 | S184,709 | S4,418 |
| Arizona: |  |  |  |  |  |
| Cerro Tololo Inter.American Observatory. | NSF | 2,200 | 1.887 | 313 | -•••• |
| Kıtt Peak National Observatory . . . . . . . . . . . . . . . . . . . . | NSF | 7,200 | 7.073 | 127 | * |
| California: <br> Center for Research and Development in Higher Education. . . . Center for the Study of the Evaluation of Instructional Programs Jet Propulsion Laboratory, total |  |  |  |  |  |
|  | HEW (OE) | 718 | 718 | ....... | ...... |
|  | HEW (OE) | 572 | 572 | -••••••• | -••••• |
|  |  | 173.360 | 162.880 | 10.480 | - |
|  | NASA | (173,337) | (162,857) | ( 10.480) | - |
|  | NSF | ( 23) | ( 23) | - | -•••• |
| Lawrence Laboratories, total |  | 176.861 | 163,122 | 13.613 | - |
|  | AEC | (176.691) | (162,970) | ( 13,613) | 1 |
|  | NSF | ( 152) | ( 152) | ....... | $\cdots$ |
|  | HEW (NIH) | ( 18) | ....... | .......' | $(18)$ |
| Stanford Center for Research and Development in Teaching | HEW (OE) | 928 | 928 | ....... |  |
| Stanford Linear Accelerator Center. . | AEC | 29,046 | 24,191 | 4.855 | -**** |
|  |  |  |  |  |  |
| National Center for Atmospheric Research . . . . . . . . . . . . . | NSF | 15,200 | 14,950 | 250 | -••••• |
| Illinors: |  |  |  |  |  |
| Argonne National Laboratory, total |  | 105.387 | 84,927 | 19.176 | 1.284 |
|  | AEC | (105.220) | ( 84,760) | ( 19,176) | $(1,284)$ |
|  | NSF | ( 167) | ( 167) | -•••••• | . |
| National Accelerator Laboratory . . . . . . . . . . . . . . . . | AEC | 94,219 | 9.149 | 85.070 | -. . . $\cdot$ |
|  |  |  |  |  |  |
| Ames Laboratory . . . . . . . . | AEC | 8,111 | 6.813 | 1,128 | 170 |
|  |  |  |  |  |  |
| Applied Physics Laboratory, total . . . . . . . . . . . . . . . |  | 62,908 | 62,908 | ........ | ...... |
|  | DOD (Nary) | ( 62,810) | ( 62,810) | . . . . . . |  |
|  | NSF | 1 98) | $($ 98) | ........ | * |
| Center for the Study of Social Organization of Schools and the Learning Process | HEWIOE) | 332 | 332 | . ....... | . . . . . |
| Massachusetts: |  |  |  |  |  |
| Cambridge Electron Accelerator | AEC | 2,886 | 2.350 | 536 | -. . . ${ }^{\text {a }}$ |
| Lincoln Laboratory, total |  | 57.116 | 57.116 | ...' | $\cdots$ |
|  | DOD (Aır Force) | ( 55,106) | $(55,106)$ | ...... | $\cdots$ |
|  | DOD (Navy) | ( 1,641) | ( 1,641) | ....... | . . . . . |
|  | NASA | ( 369) | 13691 | -...-. | $\cdots \cdot \cdots$ |
| New Jersey: |  |  |  |  |  |
| Plasma Physics Laboratory | AEC | 8,211 | 7.500 | 711 | . . . $\cdot$. |
| Princeton-Pennsylvanıa Accelerator . . . . . . . . . . . . . . . . | AEC | 2,010 | 2.000 | 10 |  |

[Dollars it thousands]


Federal obligations to Federally Funded Research and Oevelopment Centers administer Universities and Colleges, by State, institution, and type of program, fiscal year 1971 ic
[Dollars in thousands]

\begin{tabular}{|c|c|c|c|c|c|}
\hline State and Institution \& Agency \& Toral Federal obligations \& Research and development \& R\&O plant \& 0 t \\
\hline \begin{tabular}{l}
New Mexico: \\
Los Alamos Scıentific Laboratory, total
\end{tabular} \& \begin{tabular}{l}
AEC \\
HEW (NIH)
\end{tabular} \& \[
\begin{array}{r}
130.716 \\
(130.711) \\
1 \quad 5)
\end{array}
\] \& \[
\begin{array}{r}
102.522 \\
(102.522)
\end{array}
\] \& \[
\begin{array}{r}
28,137 \\
(28,137)
\end{array}
\] \& 1 \\
\hline \begin{tabular}{l}
New York: \\
Brookhaven National Laboratory, rotal
\end{tabular} \& \[
\begin{aligned}
\& \text { AEC } \\
\& \text { HEW (NIH) }
\end{aligned}
\] \& \[
\begin{array}{r}
65,614 \\
\left(\begin{array}{r}
231) \\
( \\
3831
\end{array}\right)
\end{array}
\] \& \[
\begin{array}{r}
48,594 \\
(48,336) \\
\left(\begin{array}{r}
258)
\end{array}\right.
\end{array}
\] \& \[
\begin{array}{r}
16.305 \\
\left(\begin{array}{r}
16.305)
\end{array}\right.
\end{array}
\] \& 1 \\
\hline \begin{tabular}{l}
Oregon: \\
Center for the Advanced Study of Educational Administration Pennsylvania: \\
Learning Research and Development Center . . . . . . . . . . . . Ordnance Research Laboratory .
\end{tabular} \& HEW (OE)
HEW (OE)
OOO (Navy) \& 485

1.509
7.884 \& 485

1,509
7.884 \&  \& <br>

\hline | Puerto Rico: |
| :--- |
| National Astronomy and lonosphere Center ${ }^{\text {a }}$. . . . . . . . . . . . | \& NSF \& 5.800 \& 2.000 \& 3,800 \& <br>


\hline | Tennessee: |
| :--- |
| Oak Ridge Associated Universittes, total . . . . . . . . . . . . . | \& | AEC |
| :--- |
| HUO |
| HEW (NIH) | \& \[

$$
\begin{array}{rr} 
& 5.138 \\
( & 4.285) \\
( & 550) \\
1 & 303)
\end{array}
$$

\] \& |  | 2.954 |
| :--- | ---: |
| $($ | $2.225)$ |
| 1 | $550)$ |
| 1 | 1791 | \& \[

$$
\begin{aligned}
& 118 \\
& 1 \\
& 1181 \\
& \cdots \cdots \\
& \cdots
\end{aligned}
$$
\] \& 1 <br>

\hline | Texas: |
| :--- |
| Research and Oevelopment Center in Teacher Education . . . . . |
| Virginia: | \& HEW (OE) \& 671 \& 671 \& . $\cdot$...... \& <br>


\hline | Center for Naval Analyses |
| :--- |
| Space Radiation Effects L-aboratory | \& OOO (Navy)

NASA \& 7.688

1.371 \& $$
\begin{aligned}
& 7,688 \\
& 1,291
\end{aligned}
$$ \& - 80 \& <br>

\hline | Washington: |
| :--- |
| Applied Physics Laboratory . | \& 000 (Navy) \& 1,957 \& 1,957 \& ......... \& <br>


\hline | West Virgnia: |
| :--- |
| National Radio Astronomy Observatory Wisconsin: | \& NSF \& 6.100 \& 6.400 \& . $\cdot$....... \& <br>

\hline Center for Research and Development for Learning and Re-education \& HEW (OE) \& 1.503 \& 1.503 \& \& <br>
\hline
\end{tabular}

aformerly known as Arecibo Observatory.
SOURCE: National Science FOundation (CASE).

Federal obligations to Federally Funded Research and Development Centers administered by Universıties and Colleges, by State, institution, and type of program, fiscal year 1971 (cont.)
[Dollars in thousands]

|  | Agency | Total Federal oblıgations | Research and development | R\&D plant | Other science activities | Admınıstered by- |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | AEC <br> HEW (NIH) | $\begin{array}{r} 130,716 \\ (130,711) \\ 1 \quad 5) \end{array}$ | $\begin{array}{r} 102,522 \\ (102,522) \end{array}$ | $\begin{array}{r} 28,137 \\ (28.137) \end{array}$ | $\begin{array}{lr} & 57 \\ 1 & 521 \\ 1 & 51\end{array}$ | University of California |
| .. . . . . | AEC HEW (NIH) | $\begin{array}{r} 65.614 \\ (65.231) \\ \left(\begin{array}{r} 383 \end{array}\right) \end{array}$ | $\begin{array}{r} 48,594 \\ (48,336) \\ \left(\begin{array}{r} 258) \end{array}\right. \end{array}$ | 16,305 $(16,305)$ | $\begin{array}{r} 715 \\ \\ \left(\begin{array}{r} 790 \\ ( \\ 125) \end{array}\right. \end{array}$ | Associated Universities, Inc. |
| Sministration | HEW (OE) | 485 | 485 | . . . . . . . | ...... | University of Oregon |
|  | HEW (OE) <br> DOD (Navy) | 1.509 7.884 | 1,509 7,884 | ......... | . | University of Pittsburgh Pennsylvania State University |
|  | NSF | 5,800 | 2,000 | 3.800 | ...... | Cornell University |
|  |  | 5.138 | 2.954 | 118 | 2.066 | Oak Ridge Associated Universities |
|  | AEC | ( 4,285) | ( 2.225) | $1118^{\circ}$ | ( 1,942) |  |
|  | HUD | $\begin{array}{ll}1 & 550 \\ 1 & 3031\end{array}$ | $\begin{array}{ll} 1 & 550 \\ ( & 179) \end{array}$ |  | $\begin{array}{r} \quad . . . . \\ \left(\begin{array}{r} 124) \end{array}\right. \end{array}$ |  |
|  | HEW (NIH) | 1 303) | ( 1,9) |  | 1 124) |  |
| 2rion | HEW (OE) | 671 | 671 |  | ....... | University of Texas |
|  | DOD (Navy) NASA | 7.688 1.371 | 7,688 1,291 | ........ | . | University of Rochester College of Willam and Mary |
| -•••••• | DOD (Navy) | 1,957 | 1.957 |  |  | University of Washington |
|  | NSF | 6,400 | 6.400 | ........ | ....... | Associated Universities, Inc. |
| 9 and Re.edu. | HEW (DE) | 1.503 | 1.503 | - . ..... |  | University of Wisconsin |

Part II

FEDERAL SUPPORT TO SELECTED NONPROFIT INSTITUTIONS

## Section 1. FEDERAL SUPPORT TO INDEPENDENT RESEARCH IN

This section includes R\&D funding dat., for 74 independent nonprofit institutions selected on the basis of their partilipa. ton in government-sponsored research and development.' These research instlutions which are administratively autonomous and separately incorporated organizations perform a significant role in the Nation's suentifit and technologital endeavors. Independent researth institutions are the sole institutional group, with the exception of Federally Funded Rescarch and Development Centers (FFRDC's), whose prime purpose is the conduct of research and development. In the past the supported work of these research institutions was largely defense-oriented, presently, however, an increasing numner of such organizations are drecting their R\&D efforts towards the solution of critical solietal problems.

[^18]
## Agency Distribution

In 1971 Federal R\&D funds to the 74 nonprofit research institutions in this study amounted to $\$ 173$ million. Although 14 agencies ieported funds for these institutions in 1971, two agencies, DOD and HEW, administered nearly four-fifths of the total for this sector with shares of 47 percent and 32 percent, respectively.

Obligations by the Department of Defense totaled $\$ 81$ million in 1971, an increase of 2 percent between 1970 and 1971. ${ }^{2}$ Even though DOD continues to be the major agency sponsoring R\&D projects at nonprofit research institutions, its share of support has decreased from a high of nearly 60 percent in 1969 to 47 percent in 1971. Within DOD, 1971 funds were obligated as follows:

|  | (Thousands of dollars) |
| :---: | :---: |
| Army . | \$36.176 |
| Navy | 13,051 |
| Alr Force | 26,2.45 |
| Defense agencies | 5,337 |

Each of the three departments within DOD obligated a greater sum than any of the other agencies except HEW.

HEW obligations rose by $\$ 12$ million to $\$ 56$ million from 1970-71. This 26 -percent increase resulted primarily from an increase in awards by the National Institutes of Health, the largest source of funds within HEW. Nonprofit rese irch institutes received $\$ 49$ million from NIH during 1971, 89 percent of the HEW total for this sector. Of that amount, nearly 50 percent represented obligations by the National Cancer Institute, one of the 10 NIH research institutes.

## PPORT TO INDEPENDENT RESEARCH INSTITUTIONS

Wependent
participa. nt. ${ }^{1}$ These omous and ficant role Independoup, with velopment iuct of re.
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: inslitutes - istitu tions


## Agency Distribution

In 1971 Federal R\&D funds to the 74 nonprofit research institutions in this study amounted to $\$ 173$ million. Although 14 agencies reported funds for these institutions in 1971, two agencies, DOD and HEW, administered nearly four-fifths of the total for this sector with shares of 47 percent and 32 percent, respectively.

Obligations by the Department of Defense totaled $\$ 81$ million in 1971, an increase of 2 percent between 1970 and 1971.2 Even though DOD continues to be the major agency sponsoring $R \& D$ projects at nonprofit research institutions, its share of support has decreased from a high of nearly 60 percent in 1969 to 47 percent in 1971. Within DOD, 1971 funds were obligated as follows:

|  | (Thousands of dollars) |  |  |  |
| :--- | :--- | :--- | :--- | :---: |
| Army . . . . . . . . . . . . . . . . . . . | $5.36,176$ |  |  |  |
| Navy . . . . . . . . . . . . . . . | 13,051 |  |  |  |
| Ar Force . . . . . . . . . . . . . | 26,245 |  |  |  |
| Defense agencres . . . . . . . . . . . | 5,337 |  |  |  |

Each of the three departments within DOD obligated a greater sum than any of the other agencies except HEW.

HEW obligations rose by $\$ 12$ million to $\$ 56$ million from 1970-71. This 26 -percent increase resulted primarily from an increase in awards by the National Institutes of Health, the largest source of funds within HEW. Nonprofit research institutes received $\$ 49$ million from NIH during 1971, 89 percent of the HEW total for this sector. Of that amount, nearly 50 percent represented obligations by the National Cancer Institute, one of the 10 NIH research institutes.

Federal R\&D obligations to independent research institutions, by agency


FEOERAL OBLIGATIONS FOR RESEARCH ANO OEVELOPMENT TO INOEPENDENT RESEARCH INSTIT 8Y GEOGRAPHIC OIVISION, STATE, INSTITUTION, AND AGENCY FISCAL YEAR 197.1
(ThOUSANOS OF DOLLARS)


LIGATIONS FOR RESEARCH AND DEVELDPMENT TD INDEPENDENT RESEARCH INSTITUTIONS BY GEOGRAPHIC DIVISION, STATE, INSTITUTION, AND AGENCY

FISCAL YEAR 1971
(ThOUSANOS OF DOLLARS)


| \$172,766 | 5 | 224 | \$ | 6,303 | \$ | 317 | \& | 80, 809 |  | 55,749 | \$ | 4.160 | \$ | 9,317 | \$ | 7,843 | \$ | 8,044 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 8,474 |  | 0 |  | 159 |  | 0 |  | 206 |  | 7,491 |  | 0 |  | 50 |  | 556 |  | 12 |
| 527 |  | 0 |  | 0 |  | 0 |  | 40 |  | 397 |  | 0 |  | 0 |  | 90 |  | 0 |
| 527 |  | 0 |  | 0 |  | 0 |  | 40 |  | 397 |  | 0 |  | 0 |  | 90 |  | 0 |
| 2,044 |  | 0 |  | 88 |  | 0 |  | 0 |  | 1,870 |  | 0 |  | 0 |  | 86 |  | 0 |
| 2.044 |  | 0 |  | 88 |  | 0 |  | 0 |  | 1,870 |  | 0 |  | 0 |  | 86 |  | 0 |
| 5,903 |  | 0 |  | 71 |  | 0 |  | 166 |  | 5,224 |  | 0 |  | 50 |  | 380 |  | 12 |
| 261 |  | 0 |  | 0 |  | 0 |  | 30 |  | 231 |  | 0 |  | 0 |  | 0 |  | 0 |
| 2.761 |  | 0 |  | 0 |  | 0 |  | 101 |  | 2,638 |  | 0 |  | 0 |  | 22 |  | 0 |
| 243 |  | 0 |  | 11 |  | 0 |  | 0 |  | 70 |  | 0 |  | 0 |  | 150 |  | 12 |
| 632 |  | 0 |  | 0 |  | 0 |  | 35 |  | 597 |  | 0 |  | 0 |  | 0 |  | 0 |
| 2.006 |  | 0 |  | 60 |  | 0 |  | 0 |  | 1,688 |  | 0 |  | 50 |  | 208 |  | 0 |
| 52,038 |  | 0 |  | 486 |  | 185 |  | 29, 171 |  | 15, 262 |  | 0 |  | 2.032 |  | 2.975 |  | 1,927 |
| 1.157 |  | 0 |  | 35 |  | 0 |  | 30 |  | 836 |  | 0 |  | 0 |  | 256 |  | 0 |
| 291 |  | 0 |  | 35 |  | 0 |  | 0 |  | 0 |  | 0 |  | 0 |  | 256 |  | 0 |
| 866 |  | 0 |  | 0 |  | 0 |  | 30 |  | 836 |  | 0 |  | 0 |  | 0 |  | 0 |
| 40, 045 |  | 0 |  | 418 |  | 135 |  | 26, 276 |  | 8,669 |  | 0 |  | 1,851 |  | 2,089 |  | 607 |
| 346 |  | 0 |  | 0 |  | 0 |  | 0 |  | 150 |  | 0 |  | 0 |  | 79 |  | 117 |
| 657 |  | 0 |  | 9 |  | 0 |  | 0 |  | 548 |  | 0 |  | 0 |  | 100 |  | 0 |
| $\begin{array}{r} 20,049 \\ 543 \end{array}$ |  | $\begin{aligned} & C \\ & 0 \end{aligned}$ |  | 46 0 |  | $\begin{array}{r} 35 \\ 0 \end{array}$ |  | $\begin{array}{r} 17,977 \\ 543 \end{array}$ |  | 140 0 |  | 0 0 |  | $\begin{array}{r} 1,851 \\ 0 \end{array}$ |  | 0 0 |  | 0 |
| 199 |  | 0 |  | 0 |  | 0 |  | 0 |  | 199 |  | 0 |  | 0 |  | 0 |  | 0 |
| 304 |  | 0 |  | 0 |  | 0 |  | 0 |  | 304 |  | 0 |  | 0 |  | 0 |  | 0 |
| 2,793 |  | 0 |  | 0 |  | 100 |  | 179 |  | 320 |  | 0 |  | 0 |  | 1.7. |  | 490 |
| 1.628 |  | 0 |  | 0 |  | 0 |  | 0 |  | 1,465 |  | 0 |  | 0 |  | 163 |  | 0 |
| 4,549 |  | 0 |  | 0 |  | 0 |  | 4,403 |  | 146 |  | 0 |  | 0 |  | 0 |  | 0 |
| 5,406 |  | 0 |  | 363 |  | 0 |  | 0 |  | 5,000 |  | 0 |  | 0 |  | 43 |  | 0 |

FEOERAL OBL IGATIONS FOR RESEARCH ANO DEVELOPMENT TO INOEPENOENT RESEARCH INST BY GEDGKAPHIC DIVISION, STATE, INSTITUTION, AND AGENCY-CON.

FISCAL YEAR 1971
(THUUSANDS OF DOLLARS)

| GEOGRAPHIC OIVISION, STATE, <br> AND INSTIIUTION | total | DEPART MENT OF AGRICULtURE | AT OMIC <br> ENERGY <br> COMMIS - <br> SIDN | DEPART- <br> MENT OF <br> CGM- <br> MERCE | DEPART MENT O: DEFENSE | DEPARTMENT OF HEALTH, EDULATIUN \& WELFARE | DEPART MENT OF THI INTER |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SYRACUSE UNIVERSITY RESEARCH CORP. $\qquad$ | 3, 174 | 0 | 0 | 0 | 3,17: | 0 397 | 0 |
| TRUDEAU INSTITUTE, INC........... | 397 | 0 | 0 | 0 | 0 | 397 |  |
| PENNSYLVANIA, TOTAL................. | 10, 836 | 0 | 33 | 50 | 2,865 | 5,757 | 0 |
| AMERICAN INSTITUTE FOR RESEARCH IN THE BEHAVIORAL |  |  |  |  |  |  |  |
| SCIENCES........................... | 3,005 | 0 | 0 | 0 | 1,904 | 26 | 0 |
| FRANKLIN INSTITUTE................ | 2,182 | 0 | 0 | 50 | 941 | 459 | 0 |
| GERMANT OWN LABORATORIES, INC.... | 32 | 0 | 12 | 0 | 20 | 0 | 0 |
| INSTITUTE FOR CANCER RESEARCH... | 3,980 | 0 | 21 | 0 | 0 | 3,635 | 0 |
| WISTAR INSTITUTE.................. | 1,637 | 0 | 0 | 0 | 0 | 1,637 | 0 |
| ASt NORTH CENTRAL, TOTAL.......... | 31, 711 | 0 | 3,243 | 26 | 1.1,099 | 3,417 | 4,160 |
| ILLINOIS,TOTAL...................... | 11, 323 | 0 | 18 | 26 | 3,4.97 | 160 | 3.691 |
| IIT RESEARCH INSTITUTE........... | 7, 958 | 0 | 18 | 26 | 5,497 | 0 | 486 |
| INSTITUTE OF GAS TECHNOLOGY..... | 3,205 | 0 | 0 | 0 | 0 | 0 | 3,205 |
| INTERSCIENCE RESEARCH <br> INSTITUTE. | 160 | 0 | 0 | 0 | 0 | 160 | 0 |
| MICHIGAN, TOTAL..................... | 704 | 0 | 71 | 0 | 0 | 633 | 0 |
| ATOMIC POWER DEVELOPMENT ASSOCIATES,INC..................... | 71 | 0 | 71 | 0 | 0 | 0 | 0 |
| MICHIGAN CANCER FQUNDATION INC.. | 633 | 0 | 0 | 0 | 0 | 633 | 0 |
| OHIO,TOTAL......................... | 19,531 | 0 | 3,154 | 0 | 8,602 | 2,471 | 469 |
| BATTELLE MEMORIAL INSTITUTE..... | 18,168 | 0 | 3,154 | 0 | 8,285 | 1,425 | 469 |
| COX HEART INSTITUTE............... | 773 | 0 | 0 | 0 | 266 | 507 | 0 |
| FELS RESEARCH INSTITUTE.......... | 590 | 0 | 0 | 0 | 51 | 539 | 0 |
| WI SCONS IN, TOTAL..................... | 153 | 0 | 0 | 0 | 0 | 253 | 0 |
| AMERICAN FOUNDATION FOR <br> BIOLOGICAL RESEARCH............... | 153 | 0 | 0 | 0 | 0 | 153 | 0 |

al obligations for research and uevelopment to indfoendent research institutions BY GEOGRAPHIC DIVISION, STATE, INSTITUTION, AND AGENCY - CON.

FISCAL YEAR 1971
(thousanos of oollarsi

|  | rrous | Of |  | depart- |  | NATIONAL At RO- |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| DEPART- | atomic | depart- |  | MENT OF | OEPART- | nautics | NATIONAL |  |
| MENT OF | ENEPGY | MENT OF | DEPART- | health, | MENT | AND SPACE | SCiENCE |  |
| agricul- | commis- | COM- | ment of | edulatiun | OF ThF | ADMINIS- | FOUND- |  |
|  | SIDN | MERCE | DEFENSE | $\varepsilon$ welfare | INTERIOR | tration | ATION |  |


federal obligations for research ano oevelopment to indepencent research instit BY GEOGRAPHIC DIVISION, STATE, INSTITUTION, ANO AGENCY-CON. FISCAL YEAR 1971
(THOUSANOS DF DOLLARS)

| GEOGRAPHIC DIVISION, STATE, AND INSTITUTION | total | OE PART MENT OF AGRICULTURE | ATOMIC ENERGY COMMIS - <br> SION | DEPART- MENT OF COMMERCE | OEPARTMENT OF OEFENSE | OEPARTMENT OF HEALTH, EOUCATION \& WELFARE | DEPAR OF TH INTERIO |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| WEST NORTH CENTRAL, TOTAL.......... | 9,307 | 91 | 0 | 0 | 1.011 | 7,362 | 0 |
| mi Nne sota, total. | 6,667 | 80 | 0 | 0 | 127 | 5,864 | 0 |
| MAYO FOUNDATION................... | 6,030 | 0 | 0 | 0 | 127 | 5,799 | 0 |
| MINNEAPOLIS MEO!CAL RESEARCH FOUNOATION........................ | 418 | 0 | 0 | 0 | 0 | 0 | 0 |
| NORTH STAR RESEARCH ANO OEVELOPMENT INSTITUTE........... | 219 | 80 | 0 | 0 | 0 | 65 | 0 |
| missouri,total.... . . . . . . . . . . . . . | 2.640 | 11 | 0 | 0 | 884 | 1,498 | 0 |
| CANC ER RESEARCH CENTER........... | 232 | 0 | 0 | 0 | 0 | 232 | 0 |
| - TITUTE FOR COMMUNITY <br> DIES. | 386 | 0 | 0 | 0 | 0 | 386 | 0 |
| M. west research institute...... | 2,022 | 11 | 0 | 0 | 884 | 880 | 0 |
| SOUTH ATLANTIC, TOTAL. | 10,982 | 131 | 15 | 10 | 1.319 | 5,140 | 0 |
| DISTRICT OF COL,TOTAL............... ARCTIC INSTITUTE OF NORTH | 5.116 | 0 | 15 | 0 | 580 | 1,205 | 0 |
| AMERICA. ........................... | 432 | 0 | 15 | 0 | 273 | 71 | 0 |
| BROOK INGS INSTITUTION............ | 414 | 0 | 0 | 0 | 0 | 67 | 0 |
| bureau of social science <br> RESEARCH.............................. | 1,127 | 0 | 0 | 0 | 0 | 310 | 0 |
| CARNEGIE INSTITUTION OF WASHINGTON. | 444 | 0 | 0 | 0 | 18 | 0 | 0 |
| CENTER FOR APPLIED LINGUISTICS.. | 85 | 0 | 0 | 0 | 32 | 5 | 0 |
| gorgas memorial institute of tropical ano preventive |  |  |  |  |  |  |  |
| MEDICINE............. | 555 | 0 | 0 | 0 | 121 | 434 | 0 |
| NATIONAL PLANNING ASSOC IATION... | 617 | 0 | 0 | 0 | 0 | 243 | 0 |
| RESEARCH FOUNDATION OF CHILDRENS HOSPITAL OF |  |  |  |  |  |  |  |
| WASHINGTON, DC.................... | 136 | 0 | 0 | 0 | 136 | 0 | 0 |
| the URban institute............... | 1,306 | 0 | 0 | 0 | 0 | 75 | 0 |

LIGATIUNS FOR RESEARCH AND OEVELOPMENT TO INDEPENOENT RESEARCH INSTITUTIONS by Geographic division, State, institution, ano agency- CON.
fiscal year 1971
(thousands of dollars)


| 9,307 | 91 | 0 | 0 | 1.011 | 7,362 | 0 | 324 | 59 | 460 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 6,667 | 80 | 0 | 0 | 127 | 5,864 | 0 | 119 | 59 | 418 |
| 6,030 | 0 | 0 | 0 | 127 | 5,799 | 0 | 45 | 59 | 0 |
| 418 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 418 |
| 219 | 80 | 0 | 0 | 0 | 65 | 0 | 74 | 0 | 0 |
| 2.640 | 11 | 0 | 0 | 884 | 1,498 | 0 | 205 | 0 | 42 |
| 232 | 0 | 0 | 0 | 0 | 232 | 0 | 0 | 0 | 0 |
| 386 | 0 | 0 | 0 | 0 | 386 | 0 | 0 | 0 | 0 |
| 2,022 | 11 | 0 | 0 | 884 | 880 | 0 | 205 | 0 | 42 |
| 10,982 | 131 | 15 | 10 | 1,319 | 5,140 | 0 | 68. | 1,258 | 2,423 |
| 5,116 | 0 | 15 | 0 | 580 | 1,205 | 0 | 178 | 1,258 | 1,880 |
| 432 | 0 | 15 | 0 | 273 | 71 | 0 | 0 | 73 | 0 |
| 414 | 0 | 0 | 0 | 0 | 67 | 0 | 0 | 136 | 211 |
| 1,127 | 0 | 0 | 0 | 0 | 310 | 0 | 0 | 65 | 752 |
| 444 | 0 | 0 | 0 | 18 | 0 | 0 | 178 | 248 | 0 |
| 85 | 0 | 0 | 0 | 32 | 5 | 0 | 0 | 48 | 0 |
| 555 | 0 | 0 | 0 | 121 | 434 | 0 | 0 | 0 | 0 |
| 617 | 0 | 0 | 0 | 0 | 243 | 0 | 0 | 244 | 130 |
| 136 | 0 | 0 | 0 | 136 | 0 | 0 | 0 | 0 | 0 |
| 1,306 | 0 | 0 | 0 | 0 | 75 | 0 | 0 | 444 | 787 |

FEDERAL OBLIGATIUNS FOK RESEARCH AND DEVELOPMENT TO INDEPENOENT RESEARCH INS BY GEOGRAPHIC DIVISIDN, STATE, INSTITUTION, ANO AGENCY- CON.

FISCAL YEAK 1971

|  |  |  | (THCUSAN | OF OOLLA |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| GEOGRAPHIC OIVISIUN, STATE. ANO INSTITUTION | total | DE PART MENT OF AGRICULTURE | ATOMIC <br> ENEPGY <br> COMMIS - <br> SION | DEPART- <br> MENT OF CGM- <br> MERCE | DEPARTMENT OF DEFENSE | DEPARTMENT UF HEALTH. EDUCATIUV \& WELFARE | DEP: <br> MEN <br> OF <br> INTI |
| MARYLAND, TOTAL...................... | 1,921 | 0 | 0 | 0 | 38 | 1.983 |  |
| EYE RESFARCH FOUNUATION OF BETHESOA............................ | 212 | 0 | 0 | 0 | 38 | 174 |  |
| FRIFNOS OF PSYCHIATRIC <br> RESEARCH.............................. | 689 | 0 | 0 | 0 | 0 | 689 |  |
| INSTITUTE FOR GEHAV!ORAL RESEARCH............................. | 649 | 0 | 0 | 0 | 0 | 649 |  |
| NATIONAL BIOMEDICAL RESEARCH FQUNOATIUN. | 371 | 0 | 0 | 0 | 0 | 371 |  |
| NDRTH CAROLINA,TOTAL.......... |  |  |  |  |  |  |  |
| NORTH CAROLINA,TOTAL............. RESFARCH TRIANGLE INSTIUTE.... | 3,945 3,945 | 131 131 | $\begin{aligned} & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & 10 \\ & 10 \end{aligned}$ | $701$ | $2.052$ |  |
| EAST SOUTH CENTRAL, TOTAL | 4,222 | 0 | 0 | 0 | 1,101 | 3.053 |  |
| EAST SOUTH CENTRAL. |  |  |  |  |  |  |  |
| AL ABAMA, TOTAL........................ | 4,222 | 0 | 0 | 0 | 1.101 | 3,053 |  |
| SUUTHERN FESEARCH INSTITUTE..... | 4,222 | 0 | 0 | 0 | 1.101 | 3,053 |  |
| WEST SOUTH CENTRAL, TOTAL........... | 8,464 | 2 | 111 | 0 | 4,976 | 2,781 |  |
| LOUISIANA, TOTAL..................... | 228 | 0 | 0 | 0 | 0 | 175 |  |
| GULF SOUTH RESEARCH INSTITUTE... | 228 | 0 | 0 | 0 | 0 | 175 |  |
| OKLAHOMA, TOTAL..................... | 1,307 | 0 | 0 | 0 | 153 | 1,154 |  |
| OKLAHOMA MEDICAL RESEARCH <br> FOUNOATION........................ | 1,307 | 0 | 0 | 0 | 153 | 1,154 |  |
| TEXAS,TOTAL.......................... | 6,929 | 2 | 111 | 0 | 4,823 | 1,452 |  |
| SOUTHWEST FOUNDATION FDR |  |  |  |  |  |  |  |
| RESEARCH AND EDUCATION | 1,359 | 0 | 111 | 0 | 4,823 |  |  |
| SOUTHWEST RESEARCH INSTITUTE.... | 5,570 | 2 | 111 | 0 | 4,823 | 111 |  |
| MOUNTAIN, TOTAL...................... | 3,042 | 0 | 1,837 | 0 | 566 | 64 |  |
| ARIIUNA, TOTAL....................... | 522 | 0 | 0 | 0 | 0 | 0 |  |
| LOWELL OBSERVATORY................ | 522 | 0 | 0 | 0 | 0 | 0 |  |
| NEW MEXICO,TOTAL. .................. | 2.520 | 0 | 1,837 | 0 | 566 | 64 |  |
| LOVELACE FUUNOATION FOR <br> MEDICAL EDUCATION................. | 2.520 | 0 | 1.837 | 0 | 566 | 64 |  |

cbligations for research and development to indfpenuent research institutions by gejgraphic oivision, state, institution, an' agency- CON.
fiscal year 1971
( th (usands of oollars)

| OEPAFT- | ATOMIC | DEPART- |
| :--- | :--- | :--- |
| MENT OF | ENLPGY | MENT CF |
| AGRICUL- | COMMIS- | CGY- |

total TURE

MENT CF COYSIDN


| 1,921 | 0 | 0 | 0 | 38 |
| ---: | ---: | ---: | ---: | ---: |
| 212 | 0 | 0 | 0 | 38 |
| 689 | 0 | 0 | 0 | 0 |
| 649 | 0 | 0 | 0 | 0 |
| 371 | 0 | 0 | 0 | 0 |
| 3,945 | 131 | 0 | 10 | 701 |
| 3,945 | 131 | 0 | 10 | 701 |
| 4,222 | 0 | 0 | 0 | 1,101 |
| 4,222 | 0 | 0 | 0 | 1,101 |
| 4,222 | 0 | 0 | 0 | 1,101 |
| 8,464 | 2 | 111 | 0 | 4,976 |
| 228 | 0 | 0 | 0 | 0 |
| 228 | 0 | 0 | 0 | 0 |
| 1,307 | 0 | 0 | 0 | 153 |
| 1,307 | 0 | 0 | 0 | 153 |
| 6,929 | 2 | 111 | 0 | 4,823 |
| 1,359 | 0 | 0 | 0 | 0 |
| 5,570 | 2 | 111 | 0 | 4,823 |
| 3,042 | 0 | 1,837 | 0 | 566 |
| 522 | 0 | 0 | 0 | 0 |
| 522 | 0 | 0 | 0 | 0 |
| 2,520 | 0 | 1,837 | 0 | 566 |
| 2,520 | 0 | 1,837 | 0 | 566 |


| 1.883 | 0 | 0 | 0 | 0 |
| ---: | ---: | ---: | ---: | ---: |
| 174 | 0 | 0 | 0 | 0 |
| 689 | 0 | 0 | 0 | 0 |
| 649 | 0 | 0 | 0 | 0 |
| 371 | 0 | 0 | 0 | 0 |
| 2.052 | 0 | 508 | 0 | 543 |
| 2.052 | 0 | 508 | 0 | 543 |
| 3.053 | 0 | 68 | 0 | 0 |
| 3,053 | 0 | 68 | 0 | 0 |
| 3.053 | 0 | 68 | 0 | 0 |
| 2.781 | 0 | 322 | 71 | 201 |
| 175 | 0 | 0 | 53 | 0 |
| 175 | 0 | 0 | 53 | 0 |
| 1.154 | 0 | 0 | 0 | 0 |
| 1.154 | 0 | 0 | 0 | 0 |
| 1.452 | 0 | 322 | 18 | 201 |
| 1.341 | 0 | 0 | 18 | 0 |
| 111 | 0 | 322 | 0 | 201 |
| 64 | 0 | 503 | 72 | 0 |
| 0 | 0 | 450 | 72 | 0 |
| 0 | 0 | 450 | 72 | 0 |
| 64 | 0 | 53 | 0 | 0 |
| 64 | 0 | 53 | 0 | 0 |

FEOERAL OBLIGATIONS FOR RESEARCH ANO OEVELOPMENT TO INDEPENOENT RESEARCH INS BY GEOGRAPHIC OIVISION, STATE, INSTITUTIUN, AND AGENCY- CON. FISCAL YEAR 1971

*Includes AID, EPA, HUD, LABOR, OEO, AND DOT. SOURCE: MATIOMAI SCIENCE FOUNDATION (CASE).

SDERAL OBLIGATIONS FOR RESEARCH ANO DEVELOPMENT TO INDEPENDENT RESEARCH INSTITUTIUNS BY GEOGRAPHIC OIVISION, STATE, INSTITUTIUN, ANO AGENCY-CON.

FISCAL YEAR 1971
(Thousanos of oollars)


BOR, OEO, AND DOT.
OUndation (CASE).

Of the remaining 12 agencies (each of which obligated less than $\$ 10$ million to the nonprofit sector), only three - NSF. AEC, and Interior - evidenced a significant change in nonprofit support levels between 1970 and 1971.

NSF funds to research institutions in this surve; more than tripled in 1971 from $\$ 2.5$ million te 58.0 million. Most of this increase was directed to two organizations, the National Bureau of Economic Research and the Center for Advanced Study in the Behavorial Sc:ences. Awards by NSF to the National Bureau of Economic Research in 1971 totaled $\$ 1.7$ million, primari!: funding the establishment of a research center for the development of computer technology in economic and managemeni science. The Center for Advanced Study in the Behavicral Sciences was awarded $\$ 1.6$ million under NSF's Research Applied to National Needs (RANN) program for the conduct of studies on the social consequences of technology.

The Department of the Interior sharply increased its support to research institutes included in this study from $\$ 1.6$ million in 1970 to $\$ 4.2$ million in 1971, reflecting the current expansion of coal gasification programs. Over 75 percent of Interior's 1971 funds were directed to the Institute of Gas Technology.

The Atomic Energy Commission was the only major supporting agency other than DOD to show a decline from 1970-71. AEC funds to nonprofit research organizations decreased by 26 percent to $\$ 6.3$ million, mainly as a result of reduced support to the Battelle Memorial Institute and the Atomic Power Development Associates, Inc.

A total of $\$ 407,000$ was obligated in 1971 to six research institutes for R\&D plant. Of that amount, $\$ 271,000$ represented AEC funds and $\$ 136,000$ NSF funds.

|  <br>  <br> fischa reiz 1971 <br> (theusarios of melips) |  |  |  |
| :---: | :---: | :---: | :---: |
|  240 tisitiurtay | 10ヶ92 |  | vaitneal <br> Scitrice <br> fsals:- <br> aft.18 |
|  | 407 | 271 | 136 |
|  | : Be | 0 | 136 |
| comactitcer. : ufat....................... <br>  | $\begin{aligned} & \text { iss } \\ & \text { ins } \end{aligned}$ | $\stackrel{0}{0}$ | $\begin{aligned} & 190 \\ & 192 \end{aligned}$ |
|  | 54 | 59 | 0 |
| miCnicen. iutzl............................ arguic PCofs bevilepoen: assictaresitac. | 3 | 3 | 0 |
| mulc.rcrit................................... <br>  | 52 | 52 | 0 |
| west scutn cemrase. forst.. | 5 | 5 | 0 |
| Pfres. Total $\qquad$ SNURHINF' \& ESESACM ICSTITURE.... | 5 | 5 | 0 |
|  | 120 | 100 | 0 |
| - $\qquad$ tivichat fimvos:imy fuan mytical fincaricy. $\qquad$ | 120 100 | 100 | 0 |
| PaCtfic. :sist........................ | 2* | 15 | 0 |
|  $\qquad$ manfoan E'oltateventat - Hilith fravositnv. | $: 5$ $: 9$ | 14 | 0 |

## Institutional Distribution

During 1971 the first 10 recipients of Federal R\&D support were awarded $\$ 111$ million, or 64 percent of total funding, essentially the same proportion as in 1970 . Eight of the 10 highestranking institutes in 1971 were among the 10 leaders in each of the last three years. Furthermore, the same three - Stanford Research Institute (SRI), Cornell Aeronautical Laboratory (CAL), and the Battelle Memorial Institute have led since 1969 and in the same rank order. These three institutions, each of which receives the major proportion of :ts support from DOD, accounted for 42 percent of the 1971 nonprofit total.

SRI registered the largest absolute gain in 1971. The $\$ 3$ million increase is attributable to a 12-percent DOD funding increase. DOD also increased its support to second-ranked CAL. However, overall Federal support to CAL fell by 2
percent due $t$ funds which DOD increase.

In 1971 it experienced b Institute of receive over HEW. Betwe tions to these million and 5

SOURCE: Nationa

|  <br>  FISCA YEAR 1771 |  |  |  |
| :---: | :---: | :---: | :---: |
|  2wi tosititurinv | Tust | erimic <br> retocr <br> crants - <br> Sicm | varin:, :l SCItNCE Furso art.aw |
| U:treo states, retal...........s | 417 | 271 | 136 |
| \%fm fachathe Fist=L................... | ise | 0 | 113 |
|  | 19 | 0 | 330 |
|  | 12. | $\checkmark$ | 136 |
|  | 53 | 52 | 0 |
| michtcariotgrat........................ | 6 | - | 0 |
| A8C:C PCaER DEVFLCDAEN: <br>  | $\bigcirc$ | 0 | 0 |
| mic.ictil.......................... | 52 | 52 | $\sigma$ |
|  | $5:$ | 3? | 0 |
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| ฯวuviatr. rjial...................... | 19.) | 100 | 0 |
| - ¢\% - xtceristal | 230 | 100 | 0 |
| Lnvisace finuog-iris for medtal enkaytcy | 170 | 170 | $\bigcirc$ |
| Pactfic. reter....................... | 14 | 14 | 0 |
| 42Spldercevotat... <br>  | 19 | 19 | 0 |
| MES: th frovositrx... | :4 | :* | 0 |

During 1971 the first 10 recipients of Federal R\&D support were awarded $\$ 111$ million, or 64 percent of total funding, essentially the same proportion as in 1970. Eight of the 10 highestranking institutes in 1971 were among the 10 leaders in each of the last three years. Furthermore, the same three - Stanford Research Institute (SRI), Cornell Aeronautical Laboratory (CAL), and the Battelle Memorial Institute have led since 1969 and in the same rank order. These three institutions, each of whicn receives the major proportion of its support from DOD, accounted for 42 percent of the 1971 nonprofit rotal.

SRI registered the largest absolute gain in 1971. The $\$ 3$ million increase is attributable to a 12-percent DOD funding increase. DOD also increased its support to second-ranked CAL. However, overall Federal support to CAL fell by 2
percent due to a substantial reduction in DOT funds which was not offset by the $\$ 2$ million DOD increase.

In 1971 the highest relative increases were experienced by the Mayo Foundation and the Institute of Cancer Research, both of which receive over 90 percent of their funding from HEW. Between 1970 and 1971 HEW obligations to these two institutions increased by $\$ 2$ million and $\$ 1$ million, respectively.



SOURCE: National Scitrice Foundation (CÁSE):

## Section 2. FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CEN

Federally Funded Research and Development Centers (FFRDC's) administered by nonprofit institutions constitute an important research resource for the Federal Government. Since 1968 Federal agencies have awarded a cumulative total of $\$ 970$ million to these organizations for the performance of research and development. Between 1968 and 1970 Federal R\&D support to nonprofit-managed FFRDC's increased at an average annual rate of 8 percent. However, in 1971 support to these centers fell by nearly 21 percent to a level of $\$ 216$ million.

Although each of the major supporting agencies contributed to the 1971 decline of $\$ 57$ million, three-fourths of the decrease can be attributed to a $\$ 43$ million reduction in AEC funds to the Pacific Northwest Laboratory (PNL). The lower support level for PNL in 1971 resulted from AEC's transfer of management responsibility for R\&D activities on the liquid metal fast breeder reactor (LMFBR) frcm PNL to the Westinghouse Corporation.

Agency Distribution

During 1971 the 27 FFRDC's administered by the nonprofit sector received funds for R\&D activities from 11 Federal agencies. Three agencies - DOD, HEW, and AEC - were the primary sponsors, together allocating $\$ 211$ million to these research centers, over 98 percent of the 1971 total. Of the three agencies, DOD predominated, accounting for 73 percent of the funds obligated to nonprofit FFRDC's in 1971.

DOD obligations to FFRDC's totaled $\$ 158$ million in 1971 , over $21 / 2$ times as much as all other agencies combined. Nearly three-fourths of the 1971 DOD total represented obligations by the Department of Air Force, primarily to three centers - Aerospace Corporation, 571 million; MITRE Corporation, 533 million; and the RAND Corporation, $\$ 11$ million.

The next largest supporter of non profit-assoc:ated FFRDC's was HEW which in 1971 obligated a total of $\$ 31$ million. Of that amount, $\$ 29$ mil!ion, or 96 percent, was awarded by the Office of Education to regional educational laboratories and educational polic) centers, now the primary recipients of OE's R\&D supporti. OE's educatinnal laboratories, which numbered 15 in 1971, were established in 1965 through regional initiative following expansion of the Cooperative Research Act, the major source of funds for OE-sponsored research.

While OE's R\&D funds to these laboratories increased by 11 percent from 1970-71, R\&D plant dropped from 511 million in 1970 to less than $\$ 500,000$ in 1.971 as the 1966 and 1967 Con ressional appropriations for educational research facilities were exhausted.


SOURCE- Nationa

## UNDED RESEARCH AND DEVELOPMENT CENTERS

Agency Distribution

During 1971 the 27 FFRDC's administered by the nonprofit sector received funds for R\&D activities from 11 Federal agencies. Three agencies - DOD, HEW, and AEC - were the primary sponsors, together allocating 5211 million to these research centers, over 98 percent of the 1971 total. Of the three agencies, DOD predominated, accounting for 73 percent of the funds obligated to nonprofit FFRDC's in $\mathbf{i 9 7 1}$.

DOD obligations to FFRDC's totaled $\$ 158$ million in 1971 , over $21 / 2$ times as much as all other agencies combined. Nearly three-fourths of the 1971 DOD total represented obligations by the Department of Air Force, primarily to three centers. Aerospace Corporation, 571 mil.lion; MITRE Corporation, 533 million; and the RAND Corporation, 511 million.

The next largest supporter of nonprofit-associated FFRDC's was HEW which in 1971 obli. gated a total of $\$ 31$ million. Of that amount, $\$ 29$ nillior., or 96 percent, was awarded by the Office of Ëducation to regional educational raboratories and educational policy centers, now the primary recipients of OE's R\&D support. OE's educational laboratories, which numbered 15 in 1971, were established in 1965 through regional initiative following expansion of the Cooperative Research Act, the major source of funds for OE-sponsored research.

While OE's R\&D funds to these laboratories increased by 11 percent from 1970-71, R\&D plant dropped from $\$ 11$ million in 1970 to less than $\$ 500,000$ in 1971 as the 1966 and 1967 Congressional appropriations for educational research facilities were exhausted.

Federal obligations to FFRDC's administered by nonprofit institutions


SOURCE: National Scierce Foundation (CASE).

Funding by the Atomic Energy Commission amounted to $\$ 23$ million for 1971 and supported R\&D activities at the Pacific Northwest Laboratory and the Atomic Bomb Casualty Commission. The afore mentioned $\$ 43$ million reduction in AEC funds to PNL brought AEC's share of the nonprofit FFRDC total down from 24 percent in 1970 to 11 percent in 1971.

R\&D funds from the eight remainıng agencies providing support to FFRDC's managed by nonprofit organizations totaled just over $\$ 5$ million, of which $\$ 3$ million was awarded by DOT, primarily to the MITRE Corporation.

## Institutional Distribution

Of the 27 nonprofit-administered FFRDC's receiving F\&D support in 1971, five - Aerospace Corporation, MITRE Corporation, RAND Corporation, Pacific Northwest Laboratory, and the Institute for Defense Anaylses, each with Federal R\&D funds in excess of $\$ 10$ million-accounted for $\$ 161$ million, 74 percent of the 1971 total for the nonprofit FFRDC sector. Nearly 90 percent of DOD's 1971 research center support was allocated to the four DOD-sponsored organiza-
tions within also the prim group of FF of the 528 n this group.

Four OEranked withis with R\&D ti the Far Wes search and D Northwest R

Federal obligations for research and development and R\&D plant to Federally Funded Research and Development Centers administered by nonprofit institutions, fiscal years 1968.71
[Dollars in thousands)

| State and institution | Total Federal obligations |  |  |  | Research and development |  |  |  | 1968 | R |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1968 | 1969 | 1970 | 1971 | 1968 | 1969 | 1970 | 1971 |  | 156 |
| Total | S234.093 | \$246.728 | \$273.269 | \$216,225 | \$229,308 | \$235,885 | \$256,491 | S213.997 | 54.785 | S10,8 |
| Arkansas: |  |  |  |  |  |  |  |  |  |  |
| South Centrei Regional Educationat Lab oratory Corporation ${ }^{\text {a }}$ | 711 | 320 |  |  | 700 | 320 |  |  | 11 |  |
| California |  |  |  |  |  |  |  |  |  |  |
| Aerospace Corporation | 73.626 | 76.338 | 72.953 | 71.405 | 73.537 | 76,338 | 72.953 | 71.405 | 89 |  |
| RAND Corporation | 20.407 | 20.438 | 21.167 | 21.156 | 20,295 | 20.438 | 21.167 | 21.156 | 112 |  |
| Center for Educational Policy Research ${ }^{\text {b }}$ | 500 | 500 | 448 | 444 | 500 | 500 | 448 | 444 |  |  |
| The Far West Laboratory for Educational Research and Development | 1.308 | 6.536 | 2,373 | 3.717 | 1.250 | 1.685 | 2,373 | 3.266 | 58 | 4.8 |
| Southwest Regional Laboratory for Educational Research and Cevelopment | 2.235 | 2,487 | 7,310 | 3.630 | 2.235 | 2.487 | 3,024 | 3,630 | ...... |  |
|  |  |  |  |  |  |  |  |  |  |  |
| Rocky Mountain regional Educational Laboratory ${ }^{\text {a }}$ | 514 | 346 |  |  | 514 | 346 |  | ......... | . . . . . |  |
| District of Columbia: |  |  |  |  |  |  |  |  |  |  |
| Atomic Bomb Casualty Commission . . . . . . . | 3.822 | 3.925 | 4,250 | 4.617 | 3,685 | 3.788 | 4.155 | 4.572 | 137 |  |
| Central Atlantic Regıonal Educatıonal Laboratory ${ }^{\text {a }}$ | 796 | 390 |  |  | 780 | 390 | . . . . . . . | . . . . . . . | 16 |  |
| Georgra: |  |  |  |  |  |  |  |  |  |  |
| Southeastern Educational Laboratory | 719 | 670 | 720 | 468 | 670 | 670 | 720 | 168 | $<3$ |  |
| llinois: |  |  |  |  |  |  |  |  |  |  |
| Ccoperative Educational Research Laboratory. Inc. ${ }^{\text {a }}$ | 622 | 241 |  |  | 600 | 241 | .. ..... | ...... - | 22 |  |
| Maryland: <br> Electromagnetic Compaiability Analysis Cente ${ }^{-C}$ | 5.237 | 4.642 | 5.210 | 5,903 | 5.237 | 4.642 | 5.210 | 5.903 |  |  |
| Massachusetts: |  |  |  |  |  |  |  |  |  |  |
| MITRE Corporjiion | 36,521 | 32,702 | 40.856 | 35.974 | 36.521 | 32.702 | 40,856 | 35.974 |  |  |
| Educationat Uevelopment Center. 'nc. . | 1.041 | 1.390 | 1.509 | 625 | 1.041 | 1.390 | 1,509 | 625 |  |  |

mmission supportvorthwest Casualty 3 million hit AEC's own from 71.
g agencies naged by over \$5 arded by tion.

## Institutional Distribution

Of the 27 nonprofit-administered FFRDC's receiving R\&D support in 1971, five - Aerospace Corporation, MITRE Corporation, RAND Corporation, Pacific Northwest Laboratory, and the Institute for Defense Anaylses, each with Federal R\&D funds in excess of $\$ 10$ miliion-accounted for $\$ 161$ million, 74 percent of the 1971 total for the nonprofit FFRDC sector. Nearly 90 percent of DOD's 1971 research center support was allocated to the four DOD-sponsored organiza-
tions within the leading five group. DOD was also the primary influence in the next ranked group of FFRDC's, obligating over 50 percentof the $\$ 28$ million total for the five centers in this group.

Four OE-sponsored educational laboratories ranked within the third group of leading centers with R\&D totals ranging from $\$ 3.7$ million for the Far West Laboratory for Educational Research and Development to $\$ 2.5$ million for the Northwest Regional Educational Laboratory.

Federal obligations for research and development and R\&D plant to Federally Funded Research
and Development Centers administered by non profit institutions, fiscal years 1968-71
[Dollars in thousands)

|  | Total Federal obligations |  |  |  | Research and development |  |  |  | R\&D plant |  |  |  | Sponsor. $\cdot \square$ agency |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1968 | 1969 | 1970 | 1971 | 1968 | 1969 | 1970 | 1971 | 1968 | 1969 | 1979 | 1971 |  |
|  | \$234.093 | \$246.728 | \$273.269 | \$216.225 | \$229,308 | \$235,885 | S256,491 | S213,997 | \$4,785 | \$10.843 | \$16.778 | \$ 2.228 |  |
|  | 711 | 320 |  |  | 700 | 320 |  |  | 11 | ........ | . . . . . | ....... | HEW (OE) |
|  | 73,626 | 76,338 | 72.953 | 71.405 | 73,537 | 76,338 | ;2,953 | 71.405 | 89 | ........ | . . . . . ${ }^{\text {a }}$ | ........ | DOD (Aır Force) |
|  | 20.407 | 20.438 | 21.167 | 21.156 | 20.295 | 20.438 | 21.167 | 21.156 | 112 |  |  |  | COD (A,r Force) |
|  | 500 | 500 | 448 | 444 | 500 | 500 | 448 | 444 |  |  |  |  | HEW (OE) |
|  | 1,308 | 6,536 | 2,373 | 3.717 | 1.250 | 1.685 | 2.373 | 3.266 | 58 | 4.851 | ....... | 451 | HEW (OE) |
|  | 2.235 | 2.487 | 7.310 | 3.63C | 2.235 | 2.487 | 3,024 | 3.630 |  | ........ | 4.286 |  | HEW (OE) |
|  | 514 | 346 |  |  | 514 | 346 |  | ........ | . . . . . | -....... |  |  | HEW (OE) |
|  | 3.822 | 3.925 | 4.250 | 4.617 | 3,685 | 3.788 | 4.155 | . 4.572 | 137 | 137 | 95 | 45 | AEC |
| tory ${ }^{\text {a }}$ | 796 | 390 |  | .. ..... | 780 | 390 |  |  | 16 | .... $\cdot$. |  |  | HEW (OE) |
|  | 719 | 670 | 720 | 468 | 670 | 670 | 720 | 468 | 49 | - | - |  | HEW (OE) |
| pory. | 622 | 241 |  |  | 600 | 241 |  |  | 22 | ... |  |  | HEW (OE) |
| Enter ${ }^{\text {c }}$ | 5,237 | 4.642 | 5.210 | 5.903 | 5.237 | 4.642 | 5.210 | 5.903 |  |  |  |  | DOD (Air Force) |
|  | 36,521 | 32,702 | 40.856 | 35.974 | 36.521 | 32.702 | 40,856 | 35.974 |  |  |  |  | DOD (Air Force) |
|  | 1.041 | 1,390 | 1.509 | 625 | 1,041 | 1.390 | 1,509 | 625 |  |  |  |  | HEW (OE) |

[Dollars in thousands]

| State and institution | Total Federal oblıgatıons |  |  |  | Research and development |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1968 | 1969 | 1970 | 1971 | 1968 | 1969 | 1970 | 1971 | 1968 |
| Michigan: <br> Mıchıgan-Ohıo Regıonal Educatıonal Laboratory ${ }^{a}$ | 853 | 385 |  |  | 800 | 385 |  |  | 53 |
| Minnesota: |  |  |  |  |  |  |  |  |  |
| Upper Midwest Regional Educational Laboratory. Inc. | 678 | 800 | 958 | 733 | 678 | 800 | 958 | 733 |  |
| Missouri: $\quad$. |  |  |  |  |  |  |  |  |  |
| Central Midwestern Regional Educational Laboratory | 1.370 | 1.746 | 6.138 | 4.462 | 1,350 | 1.746 | 3.233 | 4.462 | 20 |
| Mid-Continent Regional Educaional Laboratory | 730 | 938 | 957 | 869 | 730 | 938 | 957 | 869 |  |
| New Mexico: |  |  |  |  |  |  |  |  |  |
| Southwestern Cooperative Educational Laboratory | 791 | 862 | 956 | 1,097 | 752 | 862 | 956 | 1,097 | 39 |
| New York: |  |  |  |  |  |  |  |  |  |
| Center for Urban Education | 2.675 | 2,646 | 2,600 | 2,000 | 2.675 | 2,646 | 2,600 | 2,000 |  |
| Policy Research Center ${ }^{\text {d }}$. | 499 | 587 | 689 | 822 | 499 | 587 | 689 | 822 |  |
| Eastern Regional Institute for Education | 947 | 999 | 844 | 408 | 943 | 999 | 844 | 408 | 4 |
| North Carolına: National Laboratory for Higher Education ${ }^{\text {e }}$ | 698 | 820 | 1.152 | 1.170 | 694 | 820 | 1.152 | 1.170 | 4 |
| Oregon: Northwest Regional Educational Laboratory. | 1.566 | 1.763 | 1841 | -.472 | 1.544 | 1.763 | 1.841 | 2.472 | 22 |
| Pennsylvania- |  |  | 3.397 | 3.526 | 2.689 | 2.700 | 3.397 | 3.526 | 5 |
| Rasearch for Beiter Schools, Inc. . | 2.094 | 2.757 | 3,397 | 3.526 | 2.089 | 2.700 | 3.397 | 3.526 | 5 |
| Texas: Southwest Educational Development Laboratory | 1.452 | 1.843 | 6,363 | 2.160 | 1.400 | 1.710 | 2.263 | 2.160 | 52 |
| Virginia: |  |  |  |  |  |  |  |  |  |
| Instıtute for Defense Analyses . . . . . . . . . . . | 11.941 | 12.388 | 11.859 | 12.660 | 11.941 | 12,388 | 11.859 | 12,660 |  |
| Research Aanlysis Corporation | 10.308 | 9.915 | 9.524 | 9.278 | 10,308 | 9.915 | 9.524 | 9.278 | -•• |
| Human Resources Research Organization ${ }^{\text {f }}$ |  |  | 4.291 | 4.007 |  |  | 4.291 | 4.007 |  |
| Analytical Services, Inc. . . . . . . . . . . . . . . . . | 1.495 | 1.180 | 1,659 | 2.256 | 1.495 | 1.180 | 1.659 | 2.256 |  |
| Washıngton: |  |  |  |  |  |  |  |  |  |
| Pacific Northwest Laboratory. | 46,943 | 55,258 | 62.119 | 19.391 | 42.851 | 49,613 | 56.727 | 17.659 | 4.092 |
| West Virginia: <br> Apnalachia Eoucational Laboratory | 994 | 916 | 1.126 | 975 | 994 | 896 | 1,126 | 975 |  |

${ }^{3}$ Discontinued in FY 1970
${ }^{\text {badministered by Stanford Research Institute. }}$
${ }^{c_{\text {Administered }} \text { by Illinois institute of Technology Research Institute. }}$
$\mathbf{d}_{\text {Administered by }}$ Syracuse University Research Corporation.
${ }^{\text {EFormerly known as Regional Educational Labora }}$
"Was "university administered" prior to fiscal ye years.
SOURCE National Science Foundation (CASE)

Federal obligations for research and development and R\&D plant to Federally Funded Research and Development Centers, administered by nonprofit institutions, fiscal years 1968.71 (cont.)
[Doltars in thousands]

|  | Total Federal obligations |  |  |  | Research and development |  |  |  | R\&D plant |  |  |  | Sponsoring agency |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1968 | 1969 | 1970 | 1971 | 1968 | 1969 | 1970 | 1971 | 1968 | 1969 | 1970 | 1971 |  |
| $r y^{\text {a }}$ | 853 | 385 |  |  | 800 | 385 |  |  | 53 |  |  |  | HEW (OE) |
|  | 678 | 800 | 958 | 733 | 678 | 800 | 958 | 733 | ...... | ....... |  |  | HEW (OE) |
|  | 1.370 | 1.746 | 6.138 | 4.462 | 1.350 | 1.746 | 3.233 | 4.462 | 20 | ....... | 2,905 |  | HEW (OE) |
| ory | 730 | 938 | 957 | 869 | 730 | 938 | 957 | 869 | .... |  |  |  | HEW (OE) |
| ory | 791 | 862 | 956 | 1.097 | 752 | 862 | 956 | 1.097 | 39 | ....... |  | $\ldots$ | HEW (OE) |
|  | 2.675 | 2.646 | 2,600 | 2,000 | 2,675 | 2.646 | 2.600 | 2.000 |  |  |  | . . . . . | HEW (OE) |
|  | 499 | 587 | 689 | 822 | 499 | 587 | 689 | 822 | ..... | ....... |  | ... | HEW (OE) |
|  | 947 | 999 | 844 | 408 | 943 | 999 | 844 | 408 | 4 | ........ |  |  | HEW (OE) |
|  | 698 | 820 | 1.152 | 1.170 | 694 | 820 | 1.152 | 1,170 | 4 | ...... |  |  | HEW (OE) |
|  | 1.566 | 1.763 | 1.841 | 2.472 | 1.544 | 1.763 | 1.841 | 2.472 | 22 |  | $\cdots \cdot \cdots$ |  | HEW (OE) |
|  | 2,094 | 2.757 | 3.397 | 3,526 | 2.089 | 2.700 | 3,397 | 3.526 | 5 | 57 | $\ldots$ |  | HEW (OE) |
| fory | 1.452 | 1,843 | 6,363 | 2,160 | 1.400 | 1.710 | 2.263 | 2.160 | 52 | 133 | 4.100 | ...... | HEW (OE) |
|  | 11.941 | 12,388 | 11.859 | 12.660 | 11.941 | 12.388 | 11.859 | 12.660 | ...... |  |  | . . . . . | DOD (Office of the Secretary) |
|  | 10,308 | 9,915 | 9.524 | S. 278 | 10.308 | 9.915 | 9.524 | 9,278 |  |  | ..... |  | DOD (Army) |
|  |  |  | 4.291 | 4,007 |  |  | 4.291 | 4.007 | ...... |  |  |  | DOD (Army) |
|  | 1.495 | 1.180 | 1.659 | 2,256 | 1.495 | 1.180 | 1,659 | 2.256 |  |  |  |  | DOD (Aır Force) |
|  | 46,943 | 55,258 | 62.119 | 19.391 | 42.851 | 49.613 | 56.727 | 17.659 | 4.092 | 5,645 | 5.392 | 1.732 | AEC |
|  | 994 | 916 | 1,126 | 975 | 994 | 896 | 1,'26 | 975 |  | 20 |  |  | HEW (OE) |

Eformerly known as Regional Educational Laboratory for the Carolinas and Virginia.
"Was "university administered" prior to fiscal year 1970. See part II, sectior. 2 for data for those years.
STURCE National Science Foundation (CASE).

## APPENDIXES

A. Technical Notes<br>B. Statistical Tables

## CONCEPTS AND LIMITATIONS

The do!!a; totals in this report represent obligations to academic institutions, selected other nonprofit organizations, and associated Federally Funded Research and Development Centers (FFRDC's), incurred by 14 Federal agencies. Data on academic institutions and their associated FFRDC's are extracted from the CASE data collection system established by the Committee on Academic Science and Engineering of the Federal Council for Science and Technology. Data on other nonprofit organizations were collected separately.

The present data collection system used for CASE reporting represents an amalgamation of two distinct systems used in previous years. Refinements made in reporting concepts and categories should be noted when category totals for 1971 are compared with those for previous years. To the extent that "general support for science" funds are ultimately directed into "research and development" or any of the other specific academic science areas, category totals as published in previous reports in this series are not comparable with those published in this report. In trend tables and chards in this report, however, adjustments were made to data for prior years in order to make the data comparable.

Note also that the field of science distribution of some $\$ 62$ million in R\&D obligations and $\$ 28$ million in fellowship and training obligations from NIH was estimated on the basis of 1970 data reported by NIH. Because of the significant margin of error at the institution level, field of science totals for individual institutions are not shown in this report.

Data for three of the reporting agencies - the Agency for International Development, and the Departments of Housing and Urban Development and Labor - are combined for the purpose of tabular presentation. These units constitute the "other" category used as the final column heading in tables showing agency detaii.

Dollar totals reflect actual obligations by the reporting agency during a fiscal year (July 1 to Jurie 30) regardless of when funds were spent by a recipient. ${ }^{1}$ Cereain allocations for financial assistance by Federal agencies were excluded from the study, notably loans such as those made by the Office of Education for undergraduate and graduate construction, and agency support of Federal employee training and development activities. Obligations were reported in amounts rounded to the nearest thousand dollars.

Data for individual institutions represent direct support from Federal agencies and, therefore, do not make allowances for amounts subcontracted to or from other institutions. Consequently, the location of actual performance of obligated

[^19]amounts cannot be identified if that performance some site other than that of the institution to wil obiigateci. in cases of interagency transfers of fun that made the final distribution of the funds to at tutions reported the obligations.

Federal obligations :o university "systems" terms of the individual institutions comprising listed separately are Federal dollars awarded dired ministrative center of a system. However, where $t$ tion of funds is not known at the time the award cies report the funds as obligations to the system tive office, or "central system." In many case. funds are distribused by the system's central offic, institutions. To the extent this filtering effect ta amounts reported for the individual institutions w may be understated. Central system obligations in reported for the following:

> Maricopa County Junior Colleges System Claremont Colleges System Peralta Junor College District System San Diego Junior Colleges System University of California System State University System of Florida University of Illinois System Indiana University System Louisiana State University System University of Missouri System University of Nebraska Systeri University of Nevada System City University of Nevy York System Columbia Universily bystem State University of New York System University of North Carolina System Oregon State Higher Education System University of Tennessee System Texas A\&M University System University of Texas System: Virginia Community College System University of Wisconsin System Wisconsin State University System University of Puerto Rico System

Among the categories of support reported $b y$ cies, amounts shown for individual institutions m indicate the way the funds are actually spent by tions. For instance, the entire obligations by the Defense were reported under research and de though some of the funds were actually expende facilities.

Sections 1 and 2 in part 1 of this report includ between obligation data and educational data of conferred over the academic year 1969-70. The compiled from degree data collected by the Offic in the Higher Education General Information Su

## ondepts and limitations

The dollar totals in this report represent obligations to wademic institutions, selected other nonprofit organizations, and associated Federally Funded Research and Development . enters (FFRDC's), incurred by 14 Federal agencie.. Data on . odemic institutions and their associated FFRDC's are exracted from the CASE data collection system established by the Committee on Academic Science and Engineering of the $t$ ederal Council for Science and Technology. Data on other nonprofit organizations were collected separately.

The present data collection system used for CASE reporting represents an amalgamation of two distinct systems used in previous years. Refinements made in reporting concepts and ategories should be noted when category totals for 1971 are compared with those for previous years. To the extent that "乡eneral support for science" funds are ultimately directed into "research and development" or any of the other specific academic science areas, category totals as published in previous reports in this series are not comparable with those published in this report. In trend tables and charts in this report, however, .djustments were made to data for prior years in order to make the data comparable.

Note also that the field of science distribution of some $\$ 02$ million in R\&D obligations and $\$ 28$ million in fellowship and training obligations from NIH was estimated on the basis of 1970 data reported by NIH. Because of the significant margin of error at the institution level, field of science totals for individual institutions are not shown in this report.

Data for three of the reporting agencies - the Agency for International Development, and the Departments of Housing and Urban Development and Labor - are combined for the purpose of tabular presentation. These units constitute the "other" category used as the final column heading in tables showing agency detail.

Dollar totals reflect actual obligations by the reporting agency during a fiscal year (July 1 to June 30) regardless of when funds were spent by a recipient. ${ }^{1}$ Certain allocations for financial assistance by Federal agencies were excluded from the ,tudy, notably loans such as those made by the Office of Education for undergraduate and graduate construction, and agency ,upport of Federal employee training and development activities. Obligations were reported in amounts rounded to the nearest thousand dollars.

Data for individual institutions represent direct support from rederal agencies and, therefore, do not make allowances for mounts subcontracted to or from other institutions. Consequently, the location cf actual performance of obligated
${ }^{1}$ Data for the Atomic Energy Commission were provided in ierms of costs rather than obligations but are treated as subtantially the same thing in this analysis.
amounts cannot be identifice if that performance takesplace at some site other than that oi the institution to which funds are obligated. In cases of interagency transfers of funds, the agency that made the final distribution of the funds to academic institutions reported the otligations.

Federal obligations to university "systems" are shown in terms of the individual institutions comprising a system. Also listed separately are Federal dollars awarded directly to the administrative center of a system. However, where the final allocation of funds is not known at the time the award is made, agencies report the funds as obligations to the system's administrative office, or "central system." In many cases, the Federal funds are distributed by the system's central of fice to individual institutions. To the extent this filtering effect takes place, the amounis reported for the individual institutions within a system may be נnderstated. Central system obligations in FY 1971 were reported for the following:

Maricopa County Junior Colleges System
Claremont Colleges Systen:
Peralta Junior College Distuict System
San Diego Junior Colleges System
Universit: of California System
State University System of Florida
University of Illinois System
Indiana University System
Louisiana State University System
University of Missouri System
University of Nebraska System
University of Nevada System
City University of New York System
Columbia University System
State University of New York System
University of North Carolina System
Oregon State Higher Education Sustem
University of Tennessee System
Texas A\&M University System
University of Texas System
Virginia Community C.ollege System
University of Wisconsin System
Wisconsin State University System
University of Puerto Rico System
Among the categories of support reported by Federal agencies, amounts shown for individual institutions may not always indicate the way the funds are actually spent by these organizations. For instance, the entire obligations by the Department of Defense were reported under research and development, although some of the funds were actually expended for plant and - facilities.

Sections 1 and 2 in part $I$ of this report include comparisons between obligation data and educational data on total degreés conferred over the academic year 1969-70. These figures were compiled from degree data collected by the Office of Education in the Higher Education General Information Survey (HEGIS).

## relationship of this study to federat funds FOR RESEARCH, DEVELOPMENT, AND OTHER sCientific activities

Both this study and Federal Funds for Research, Develop. memt, and Other Screntific Activities, ${ }^{2}$ obtan data on obligations by Federal agencies for research and development and R\&D plant to universities, colleges, other nonprofit institutions, and their associated Federally Funded Research and Development Centers. This study is oriented toward obtaining information on total Federal support for individual institutions and selected nonprofit research organizations, while the federal Funds study obtains data on research and development and R\&D plant obligated by Federal agencies to each sector of the economy, including Government, industry, universities and colleges, and all other nonprofit organizations. In Federol Funds, the emphasis is on character of activity and field of science, rather than individual recipients.

In general, there is confort ity of concepts and definitions used in the two slulies. Note, nowever, that data do not and cannot conform in all respects. Information used in Federal Funds is based on the agencies' budgets which, of course, cannot sfow details on the recipients of funds.

For the purpose of this report, "selected nonprofit organizations" include primarily independent nonprofit research institutions. Omitted from this group ate hospitals, academies of science, museums, professional and technical societies, and private philanthropic foundations all of which are included in the Feder. of Funds classification of nonprofit organizations. Also, since this study covers 14 Federal departments and agencies and Federal funds obtains reports on a Government-wide basis, there is a difference repiesenting the amounts obligated to institutions by agencies not in the CASE study.

Among other differences is the fact that the Nationat Institutes of Health (NIH) reported its General R earch Support Grants Program as research and development ir, Federal Funds, and "general support for science" in the CASE study. The National Science Foundation provided estimates to Federal Funds of amounts expended by universities for research and development and R\&D plant from institution-based grants, university science development grants, departmental science development grants, and college science improvement pranis. For individual institutions of higher education, the allocation of funds from these programs differ widely and, consequently, all of the Foundation's obligations for institutional grant and science development programs were reported as "general support for science" in the CASE study.

In cases of interagency transfers of funds, the present study instructs the agency that actually obligates funds to an academic institution to report the obligation. In Federal Firnds, on the other hand, agencies initiatong the interagency transfers report the obligated amounts.

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## DEFINITIONS OF TERMIS

University or college consists of all parts of the academic institution such as a college of liberal arts, professional school, hospital, school of agriculture, agricultural experiment station, etc. - except an associated Federally Funded Research and Development Center. Universities and colleges inclu de all institutions of hig:-r education in the United States that offer at least 2 years of college-level studies in residence. The universe of institutions for this report is based upon the Office of Education's Education Directory 1970-71. To be included in this report, an institution must have received some Federal support in fiscal year 1971 and must possess a significant degree of autonomy with respect to educational administrative responsibilities. Thus, universities and colleges organized under systems, e.g., groups of institutions collectively having legal status and generally accorded recognition by a State, by a board of education, or other relevant organization, are shown as separate instututions in ca..; where significant autonomy exists. Obligations to branches and campuses of institutions are not shown separately but are included in the total for the parent institutions. Obligations to service schools were excluded from the study. Also excluded were funds awarded to the U.S. Department of Ast,culture Graduate School.

Nomprofit research institutions inc!uded in this study were limited to 74 selected independent research institutes and 27 nonprofit-administered FFRDC's. Compiled prior to the sta:t of the 1971 survey, the list of research institutes sent to Federal agencies was made up of those institutions that were believed to be most likely to receive at teast $\$ 300,000$ in Federal R\&D obligations for FY 1971. To assure as complete coverage as possible, the list includes several institutions that had funding levels below $\$ 300,000$. Since the survey produced funding information on these smaller organizations, they are included in the report. Excluded from the study of selected nonprofit insti. tutions are such nonprofit organizations as nonprofit hispotals, academies of sciences, professional and technical sovieties, museums, and philanthropic ticundations.

FFRDC's in this report are organizational untts managed by universities and colleges or other nonprofis anstitutions. Generally, these units have been established to meet a particular R\&D need of a Federal agency. The Committee on Academic Science and Engineering (CASE) has developed uniform identification and classification criteria for use by all sponsoring agencies. To be classified as an FFRDC, an organization should:
(a) Perform primarily one or more of the following: basic research, applied research, development, or management of research and development. Specifically excluded are organizations engiged primarily in routine quality control and testing, routone service artivities production mapping an. surveys, and information dissemınation;
(b) Constitute a separate operational unit within the parent organization or be organized as a separately incorporated organization;

## DEFINITIONS OF TERAS

University or college consists of all parts of the academic institution such as a college of liberal arts, professional school, hospital, school of agriculture, agricultural experiment station, etc. - except an associated Federally funded Research and Development Center. universities and colleges include all institutions of higher education in the United States tha' offer at least 2 years of college-level studies in residence. The universe of institutions for this report is based upon the Office of Educrtion's Education Directory 197ril. To be included in this report, an institution must have received some Federal support in fiscal year 1971 and must possess a significant degree of autonomy with respect to educational administrative resporsibilities. Thus, unibersities and colleges organized under systems, e.g. groups of institutions collectively having legal status and generally accorded recognition by a State, by a board of education, or other relevant organization, are shown as separate institutions in cases where significant sutonomy exists. Obligations to branches and campuses of institutions are not shown separately but are included in the total for the parent institutions. Obligations to senice schools were excluded from the study. Also eveluded were funds awarded to the U.S. Department of Agriculture Graduate School.

Nonprofit research institutions included in this study were limited to 7.4 selected independent research institutes and 27 nonprofit-zdministered FFRDC's. Compled prior to the start of the 1971 suncey, the list of research institutes sent to Federal agencies was made up of those institutions that were believed to be most lihely to receive at least $\$ 300,000$ in Federal $\mathrm{K} \& 0$ obligations for FY 1971. To assure as complete coverage as possible, the list includes several institutions that had funding levels below $\$ 300,000$. Since the survey produced funding information on these smaller organizations, they are included in the report. Excluded from the study of selected nonprofit institutions are such zonprofit organizations as nonprofit hospitals, academies of sciences, professional and technical societies. muscums, and pt. 'hropic foundations.

FFRDC's in this report are organizational units managed by universities and colleges or other nonprofit institutions. GeneralIy, these units have been established to meet a particular R\&D need of a Federal agency. The Committee on Academic Science and Engincering (CASE) has developed uniform identification and classification criteria for use by all sponsoring agencies. To be classified as an FFRDC, an organization should:
(a) Perform primarily one or more of the following: basic research, applied research, development, or management of research arid development. Specifically excluded are organizations engaged primarily in routine quality control and testing, routine service detivities, production mapping and surveys, and information dissemination:
(b) Constitute a separate operational unit within the parent organization or be organized as a separately incorporated organization;
(c) Perform actual research and development or R\&D management either upon dirt. 1 request of the Gotern. ment or under a broad charter from the Government, but in either case under the direct monitorship of the Government:
(d) Receive its major financial support - 70 percent or more - from the Federal Government, usually from one agency;
(e) Have, or be expected to have, a long-term relation. ship - about 5 years or more - with its sponsoring agency, as evidenced by the specific obligations it and the agency assume:
(f) Be established in the contract so that most or all of the facilities are owned or funded by the Government; and.
(g) Have an average annual budget, including operating ared capital equipment, of at least $\$ 500.000$.
Inclucied in this report are 31 FFRDC's administered by universittes and colleges and 27 FFROC's administered by other nonprofit institutions. Of the 31 FFROC's associated with unisersities and colleges in 1971,23 are admanistered by specified universities: seven are managed solely by university consortia; and one, Argonne National Laboratory, is managed jointly by the Unive rsity of Chicago Jnd Argonne Universitics Association.

Academic science includes the sum of activities classified under si eategories: research and development: R\&D plant; facilities and equipment for instruction in science and engineering; fellow ships, traineeships, and training grants; general support for science: and other science activities. Each of these categories is defined below.

Research is defined as scientific inquiry. It includes basic studies - those oriented toward deeper or more meaningful understanding and knowledge per se in a particular subject or field: sed applied studies - those aimed at new or more complete knowledge in the light of potential practical application.

Development is the systematic use of scientific knowledge directed toward the production of useful materials, devices, systems, or methods, including design and development of prototypes and processes. It excludes quality controi, routine product testing, and production.

R\&D pla . includes all direct, indirect, incidental, or related costs resulting from, or necessary to the construction of, acquisition of, major repair to, or alterations in structures, works, fixed equipment, facilities, or land for use in scientific reseurch und dete/opment. Fixed equipment includes accelerators, reactors, wind funnels, radio telescopes, etc.

Facilities and equipment for instruction in science and engineering include all direct, indirect, incidental or other costs relating to the construction, dequisition, renovation, modificaticn. repair, or rent.al of facilities, land, works, or equipment for use in instruction in science .nd eng. ecering.

Fellowships, traineeships, and training grants include all awards (stipends and cost-of-education allowances) for the training of individuals or groups of individuals to meet the future demand for scientific and technical manpower. Eiactuded from this category are funds for research institutes, seminars, and conferences: educational institutes. seminars, and conferences; and ihe decelopment of educational techniques or materials.

General support for science includes activities which provide support for nonspecific or generalized purposes related to scientific research and education. Such projects are generally oriented toward academic departments, institutes, or institutions as a whole. "General support" implies a spectrum of varying types of support. At one extreme is support provided without any specification of purpose other than that funds be used for scientific activities. Another kind of "general support" is to be found in projects that provide funds for activity within a specified field of science or engineering but without specification of explicit purpose. The distinguishing feature of 'general support for science" projects is that they permit a significant measure of freedom as to purpose (research, faculty support, education, institutional support, ctc.).

Among the projects reported under the category "General Support for Science" were projects awarded through the following agency programs:

NIH General Resfarch Support Grants
NIH Health Sciences Advancement Awards
NIH Biomedical Sciences Support Grants
NSF Institutional Grants for Science
NSF Science Development Program
NSF College Science Improvement Programs
NSF Cooperative College - School Science Program
Other science activities include USDA's cooperative extension programs; educutional or rescurch institutes, seminars, or conferences; and other science activities not included in one of the other five academic science categories.

Nonscience activities include all other programs not included in the six science categories defined above.

## Fields of Science

Science and enginecring represent the sum of ail fields of science and engineering. These are divided into eight broad categories each consisting; of a number of fields. Shown below are definitions of each broad field together with an illustrative list of disciplines under each of the subfields.
(.) Physical sciences are concerned with the underst.anding of the material universe and its phenomena. They comprise the fields of astronomy. chemistry, physics, and physical sciences not elsewhere classified. Examples of the disciplines under each of these fields follow.
istronomy:
Laborators astrophysics: optical astronomy: radio astronomy: theoretical astrophysics: X-r.st, gammairay, neutrino astranomy.

Chemistry:
Inorganic: organo-metallic organic: physical.
Phy sics:
Acoustics: atomic and molecular: condensed matter: elementary particles: nuclear structure: optics: plasma.

Phisicicul sciences, n.e.c. ${ }^{3}$
(b) Mathematics employs logical reasoning with the aid of symbols and is concerned with the development of methods of operation employing such symbols. Evampies of mathemati. cal disciplines are:

Algebra; analysis: applied mathematics: computer science: foundations and logic; geometry; nume. analysis: statistics; and topology:
(c) Environmental sciences (terrestrial and extraterrestrial) are concerned with the gross nonbiological properties of the areas of the solar system which directly or indirectly affect man's survival and welfare. They comprise the fields of atmospheric sciences, geological sciences, oceanography, and ensironmental sciences not elsewhere classified. Examples of the disciplines under each of these fields are

## . itmospheric sciences:

Aeronomy: solar; weather modification; evtraterrestrial atmospheres: metcorology.

## Geologicul sciences:

Enyinecring geophysics: senera! geology: geodesy, and graitv: geomaynetism: hydrology: inorganic geochemistry; isotopic geochemistry; organic geockemistry: laboratory geophysics; paleomagnetism: palcontology: physical geography and cartography; seismolosy: soil sciences.

> Occonogruphy:

Chemical oceanography: geologic.al oce.anography: physic.al oceanography; marine geophysics.

Environmentul sciences, n.e.c. ${ }^{3}$
(d) Engineering is concerned with studies directed toward developing enginecring principles or toward making specific scientific principles usable in enginecring practice. Engincering is divided into eight categories: Aeronautical, astronautical, chemical, civil, electrical, mechanical, metallursy and materials, and engineering not elsewhere classified. Examples of disciplines under each of these engineering fields are

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. They comprise
and ohysical sci-
fisciplines under

## Astronomy:

Laboratory astrophysics; optical astronomy; radio astronomy; theoretical astrophysics; X-ray, gammaray, neutrino astronomy.

Chemistry:
Inorganic; organo-metallic organic; physical.

## Physics:

Acoustics: atomic and molecular: condensed matter; elementary particles: nuclear structure: optics: plasma.

Physical sciences, n.e.c. ${ }^{3}$
(b) Mathematics employs logical reasoning with the aid of symbols and is concerned with the development of methods of operation employing such symbols. Examples of mathematical disciplines are:

Algebra; analysis; applied mathematics; computer science; foundations and logic; geometry; numerical analysis; statistics; and topology.
(c) Environmental sciences (ierrestrial and extraterrestrial) are concerned with the gross nonbiological properties of the areas of the solar system which directly or indirectly affect man's survival and welfare. They comprise the fields of atmospheric sciences, geological sciences, oceanography, and environmental sciences not elsewhere classified. Examples of the disciplines under each of these fields are

Atmospheric sciences:
Aeronomy: solar; weather modification; extraterrestrial atmospheres; metcorology.

Geological sciences;
Enginecring geophysics: general geology; geodesy and gravity; geomagnetism: hydrology; inorganic geochemistry; isotopic geochemistry; organic geochemistry; laboratory geophysics: palcomagnetism; palcontology; physical geography and cartography: seismology; soil sciences.

## Oceanogruphy:

Chemical oceanography; geological occanography; physical oceanography; marine geophysics.

Environmental sciences, n.e.c. ${ }^{3}$
(d) Engineering is concerned with studies directed toward developing engineering principles or toward making specific scientific principles usable in engineering practice. Engineering is divided into eight categories: Acronautical, astronautical, chemical, civil, electrical, mechanical, metallurgy and materiats, and engineering not elsewhere classified. Examples of disciplines under each of these engineering fields are

[^22]
## Aeronautical:

Acrodynamics.
Astronouticul:
Aerospace; space technology. Clıemical:
Petrolcum; petroleum refining: process. Ciril:
Architectural; hydraulic; hydrologic; marine; sanitary and envi ronmental; structural: transportation.

## Electrical:

Communication; electronic; power. Mechanicui:
Engineering mechanics.
Metallurgy and materials:
Ceramic; mining; textile; welding.
Engineering, n.c.c.: ${ }^{3}$
Agricultural; industrial and management; nuclear; ocean engineering; systems.
(c) Life sciences consist of the biological, clinical medical, other medical sciences and life sciences not elsewhere classified.

Biological sciences are those which, apart from the clinical medical and other medical sciences defined below. deal with the origin. development, structure, function, and interaction of living things. The agricultural and basic medical sciences are included. Examples of biological sciences are

Anatomy: animal sciences; bacteriology; biochemistry: biogeography; biological oceanography; biophysics; ecology; embryology; entomology; evolutionary biology: genetics; immunology; microbiology; nutrition and metabolism; parasitology: pharmacology: physical anthropology; physiology; plant sciences; radiobiology: systematics.

Clinical medical sciences are concerned with the study of the pathogenesis, diagnosis or therdpy of a particular disease or abnormal condition in living human subjects under controlled conditions.

Other medicul sciences are concerned with studies of the causes, effects, prevention, or control of abnormal conditions in man or in his environment as it relates to health, except for the clinical aspects as defined above.

## Life sciences, n.e.c. ${ }^{3}$

(i) Psychology deals with behavior, mental processes, and individual and group characteristics and abilities. Psychology is divided into three categories: biological aspects, social aspects, and psychological sciences not elsewhere classified. Examples of the disciplines under each of these fields are

Biological aspects:
Experimental psychology; animal behavior; clinical psychology; comparative psychology; ethology.

## Social uspects:

Social psychology; educational, personnel, vocational psychology and testing; industrial and engineering psychology; development and personality.

## Psychological sciences, n.e.c. ${ }^{3}$

(g) Social sciences are directed toward an understanding of the behavior of social institutions and of individuals as members of a group. These include anthropology, economics, history, linguistics, political science, sociology, and social sciences not elsewhere classified. Examples of the disciplines under each of these fields are

Anthropology:
Archaeology; cultural and personality; social and ethnology; applied anthropology.

## Economics:

Econometrics and economic statistics; history of economic thought; international economics; industrial, labor and agricultural econom:cs; macroeconomics; microeconomics; public finance and fiscal policy; theory.

## History:

Cultural; political; social; history and philosophy of science.

Line aistics:
Anth:opological-archacological; computational; psycholinguistics: sociolinguistics.

## Political science:

Area or regional studies; comparative government; history of political ideas; international relations and law; national political and legal systems; political theory; public administration.

## Sociology:

Comparative and historical complex organizations; culture and social structure; demography; group interactions; social problems and social welfare; sociological theory.

Social sciences, n.e.c. ${ }^{3}$
Research in law and education, n.e.c.; socioeconomic geography.
(h) Other sciences not elsewhere classified for this report include single projects as well as multidisciplinary and interdisciplinary projects that could not be classified within one of the above broad fields of science.

B-1 Federal .obligations to universities and colleges, by type of program and agency, fiscal years 1963.71

B-2 Federal obligations to universities and colleges, by agency and type of activity, FY 1971 $\qquad$ Obligations by the Department of Health, Educa tion, and Welfare to universities and colleges, by type of program and subdivision, fiscal year 19714
B-4 Obligations by the Department of Defense to universities and colleges, by type of program and subdivision, FY 1971

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B-6 Total Federal obligations to universities and colleges, by geographic division, State, and agency, FY 1971
B. 7 Federal obligations for academic science, by geo graphic division, State, and agency, FY 1971 . . . . 5
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Geographic Distribution
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Table B－1．Federal obligations to universities and colleges，by type of program and agency，FY 1963.71

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[^23]Table B－2．Federal obligations to universities and colleges，by agency and type of activity，FY 1971
［Dollars in thousands］

| Agency | Toral obligations | Academic science |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Tótal academic science | Research and development | R\＆D plant | Facilities and equipment for instruction in science and engineering | Fellowships， traineeships， and training grants | General suppart for science | Other science activities | Nonscience activities |
| Total，all agencies． | 3，480，150 | 2.335 .868 | 1．544．130 | 29，942 | 28，729 | 421，029 | 99.669 | 212．369 | 1，144，282 |
| Department of Agriculture | 214.597 | 214.597 | 74.793 |  | 325 | ＊．．．－． | －．．．． | 139.479 | －－．．．．． |
| Atomic Energy Commission． | 105.836 | 105，836 | 95.862 | 4．800 | 2，300 | 2.606 |  | 268 | －－．．．．．． |
| Department of Commerce．． | 9.673 | 7.637 | 6.887 | ．－．． | ．－－ | 25 | 221 | 504 | 2,036 |
| Department of Defense | 241.773 | 241.773 | 241.773 |  |  | … |  | ．．．．－－ |  |
| Office of Economic Opportunity ．． | 37，521 | 16.378 | 16.378 | －－－－ | ． | 10.133 |  |  | 21，143 |
| Environmental Protection Agency ．．． | 27，160 | 27，160 | 17.027 |  |  | 10，133 |  |  |  |
| Department of Health，Education，and Welfare． | 2，263，406 | 1．142．338 | 695.717 | 15．169 | 13，908 | 361．440 | 40，209 | 15，895 | 1，121，068 |
| Department of the interior ．．．．．．． | 22.617 | 22，582 | 21.277 |  | 129 | 38 | 1.138 |  | 35 |
| National Aeronautics and Space Admin－ istration | 134，054 | 134，054 | 128.531 | 235 |  | 1，044 |  | 4.244 | ．．．．．．．．． |
| National Science Foundation | －387，737 | 387.737 | 216.883 | 9.738 | 12,067 | 42，293 | 56，892 | 49，864 | ．．．．．． |
| Department of Transportation | 10,824 24.952 | 10.824 24.952 | 7.977 21.025 | －．．．． | ．．．．．． | 2,847 603 | 1．209 | 2，115 |  |

[^24]Table B－3，Obligations by the Department of Health，Education，and Welfare to universities and colleges，
on and type of activity，FY 1971
［Dollars in thousands］

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[^25]| Nationat Aeronaturics dita Space Maimm is:ration | 134.054 | 134.054 | 128.531 | 235 | 12 | 1,044 |  | 4,244 | **-...* |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| National Science Foundation | 387,737 | 387.737 | 216.883 | 9.738 | 12.067 | 42.293 | 56,892 | 49,864 | "-...... |
| Department of Transportation | 10,824 | 10.824 | 7.977 | . - - . | . . . . | 2,847 |  | . . . . - |  |
| Other ${ }^{\text {a }}$. . . . . . . . . . . . | 24,952 | 24.952 | 21,025 |  |  | 603 | 1.209 | 2,115 |  |

a Includes AID, HUD, and Labor.
SOURCE: National Science Foundation (CASE).
Table B-4. Obligations by the Department of Defense to universities and colleges,
[Dollars in thousands)


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USDA$\begin{array}{rr}279,233 & 0,443 \\ 3,308 & 1,042 \\ 11,903 & 1,329 \\ 6,470 & 1,341 \\ 200,113 & 2,551 \\ 12,520 & 1,013 \\ 44,911 & 1,367 \\ 403,050 & 18,453\end{array}$297，717 30，712$N$
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TAgle 8－7 GEOGRAPHIC DIVISION UNITED STATES，TOTAL ..... nEh EnGland，total
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Table B-8 Distribution of Federal obligations to universities and colleges and degrees awarded by universities and

| Division and State | Total obligations FY 1971 | Total <br> degrees awarded <br> 1969.70 | Academic science obligations <br> FY 1971 | R\&D obligations <br> FY 1971 | Dogrees awarded in the sciences and engineering, 1969-70 |  |  |  <br> D.D.S. degrees <br> 1969.70 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | Ph. ${ }^{\text {d. }}$ | Master's | Bachelor's |  |
| United States, total | 3,480,150 | 1,068,849 | 2,335,868 | 1,544,130 | 17,627 | 48,662 | 263,301 | 12,122 |
|  | Percent of U.S. total |  |  |  |  |  |  |  |
| New England | 9.81 | 7.38 | 11.95 | 13.58 | 8.95 | 7.82 | 7.61 | 4.84 |
| Maine | . 20 | . 45 | . 14 | . 09 | . 12 | . 27 | . 55 |  |
| New Hampshire | .56. | . 45 | . 51 | . 43 | . 28 | . 38 | . 59 | -..--. |
| Vermont | . 29 | . 34 | . 28 | . 26 | . 16 | . 11 | . 42 | . 48 |
| Massachusetts | 6.65 | 4.10 | 8.57 | 10.29 | 5.86 | 5.29 | 4.16 | 3.68 |
| Rhode island | . 47 | . 57 | . 54 | . 61 | . 83 | . 58 | . 59 | ...... |
| Connecticut | 1.64 | 1.48 | 1.92 | 1.90 | 1.70 | 1.20 | 1.30 | . 68 |
| Middle Atlantic | 16.37 | 17.54 | 17.25 | 17.61 | 17.20 | 19.90 | 18.08 | 21.16 |
| New York | 9.77 | 9.46 | 10.75 | 11.21 | 10.17 | 11.98 | 9.52 | 11.23 |
| New Jersey | 1.60 | 2.27 | 1.49 | 1.55 | 2.14 | 2.58 | 2.17 | 1.34 |
| Pennsylvania | 5.00 | 5.81 | 5.02 | 4.85 | 4.88 | 5.33 | 6.39 | 8.59 |
| East North Central | 15.23 | 20.43 | 16.11 | 16.06 | 22.49 | 20.82 | 19.43 | 19.79 |
| Ohio | 3.16 | 5.02 | 3.08 | 2.62 | 4.00 | 3.96 | 4.77 | 4.44 |
| Indiana | 1.86 | 3.04 | 1.92 | 1.84 | 3.98 | 3.73 | 2.76 | 2.52 |
| llinois | 4.43 | 5.17 | 4.86 | 5.26 | 6.64 | 5.84 | 4.91 | 6.48 |
| Michigan | 3.48 | 4.71 | 3.67 | 3.73 | 4.77 | 4.98 | 4.33 | 3.99 |
| Wisconsin | 2.29 | 2.49 | 2.57 | 2.63 | 3.10 | 2.31 | 2.66 | 2.36 |
| West North Central | 9.06 | 9.61 | 7.22 | 6.21 | 8.92 | 8.15 | 9.34 | 10.92 |
| Minnesota | 2.42 | 2.05 | 1.98 | 1.75 | 1.89 | 1.15 | 2.14 | 2.36 |
| lowa | 1.53 | 1.66 | 1.25 | 1.02 | 2.25 | 1.19 | 1.79 | 1.35 |
| Missouri | 2.70 | 2.40 | 2.20 | 2.05 | 2.09 | 2.72 | 2.21 | 4.11 |
| North Dakota | . 29 | . 14 | 22 | . 16 | . 31 | . 56 | . 43 | . $\cdot$.... |
| South Dakota | . 32 | . 53 | . 25 | . 19 | . 17 | . 53 | . 54 | ...... |
| Nebraska | . 82 | 1:06 | . 47 | . 34 | . 59 | . 51 | . 87 | 2.12 |
| Kansas | . 98 | 1.48 | . 85 | . 71 | 1.63 | 1.47 | 1.37 | . 98 |
| South Atlantic | 14.61 | 12.42 | 12.75 | 11.67 | 11.44 | 10.70 | 12.29 | 15.53 |
| Delaware | . 16 | . 18 | . 17 | . 12 | . 29 | . 27 | . 22 | . $\cdot$... |
| Maryland | 2.30 | 1.54 | 2.69 | $\times 2.92$ | 2.09 | 1.26 | T. 42 | 2.62 |
| District of Columbia | 2.83 | 1.11 | 1.08 | * 1.08 | 1.45 | 2.06 | . 86 | 3.95 |
| Virginia | 1.29 | 1.62 | 1.20 | . 97 | 1.19 | 1.10 | 1.94 | 2.08 |
| West Virginia | . 57 | . 89 | . 40 | . 25 | . 57 | . 61 | . 86 | . 85 |
| North Carolina | 3.01 | 2.16 | 3.20 | 2.80 | 2.31 | 1.59 | 2.37 | 1.98 |
| South Carolina | . 69 | . 84 | . 48 | - 29 | . 47 | . 45 | . 86 | . 67 |
| Georgia | 1.66 | 1.71 | 1.50 | 1.27 | 1.13 | 1.43 | 1.74 | 2.22 |
| Florida | 2.10 | 2.38 | 2.04 | 1.96 | 1.95 | 1.93 | 2.03 | 1.15 |
| East South Central | 5.60 | 5.81 | 4.09 | 3.37 | 3.30 | 4.03 | 5.50 | 7.30 |
| Kentucky | 1.03 | 1.45 | . 79 | . 59 | . 68 | . 81 | 1.24 | 2.00 |
| Tennessee | 2.17 | 1.89 | 1.63 | 1.39 | 1.54 | 1.54 | 2.01 | 3.61 |
| Alabama | 1.55 | 1.48 | 1.10 | 1.01 | . 66 | . 99 | 1.42 | 1.06 |
| Mississippi | . 85 | . 99 | . 57 | . 38 | . 43 | . 69 | . 83 | . 62 |
| West South Central | 7.94 | 8.83 | 6.82 | 5.87 | 7.20 | 7.59 | 8.17 | 8.60 |
| Arkansas | . 63 | . 82 | . 41 | . 25 | . 29 | . 48 | . 80 | . 72 |
| Louisiana | 1.89 | 1.67 | 1.30 | . 88 | 1.25 | 1.24 | 1.54 | 2.43 |
| Oklahoma | . 92 | 1.48 | . 80 | . 54 | 1.53 | 1.43 | 1.20 | . 78 |
| Texas | 4.50 | 4.86 | 4.31 | 4.20 | 4.14 | 4.44 | 4.63 | 4.69 |
| Mountain | 5.14 | 5.15 | 5.27 | 5.41 | 5.45 | 5.85 | 5.16 | 1.35 |


aincludes Puerto Rico, Virgin Islands, and Guam. The amounts to the Virgin Islands
and Guam were a smail fraction of the total.

## TABLE 8-9

FEDERAL OBLIGAYIONS YO UNIVFRSITIES AND COLLEGES IN DESCEVOING ORDER
OF AMOUNTS RECEIVFO. BY INSTITUYION ANO TYPE OF ACTIVITY, FY IOTI

| RANK | institution tranked <br> by total federal obligations) | TOTAL, ALL ACTIVITIES | TOTAL aCademic SCIENCE | $\begin{aligned} & \text { RESEARCH } \\ & \text { DEVELOPDENT } \end{aligned}$ | $\begin{aligned} & \text { REO } \\ & \text { PLANT } \end{aligned}$ | $\begin{aligned} & \text {-ACADEMIC SO } \\ & \text { FACIL, FOR } \\ & \text { INSTR, IV } \\ & \text { SCI, \&ENG } \end{aligned}$ | ENCF FELLOWSHIPS. TRalneeships. TRAIN, GRANTS | GENERAL SUPPORT FOR SCIENCE | OPHER SCIENCE | VONSCIENCE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | UNITEO STATES.. TOTAL | 3.480 .150 | 2,335,858 | 1.544.130 | 29.942 | .23 .727 | 421,020 | 09,669 | 212:369 | 1,144.282 |
| 1 | MASS 1 NST OF TECH | 89.574 | 88,823 | 81.5.\% | 1.050 | 29 | 4.507 | 376 | 1.330 | $751$ |
| 2 | UNIV OF MINNESOTA | 72.534 | 43.812 | 26,707 | -2.983 | 11 | 8,909 | 1:031 | 4.171 | $28,722$ |
| 3 | UNIV OF MICHIGAN | 60.881 | 53.505 | 40.819 | 103 | 375 | 9,057 | 987 | 2.164 | 7.376 |
| 4 | UNIV OF WISCDNSIN MADISON | 57,320 | 52.124 | 36.871 | 136 | 47 | 8.786 | $2 \cdot 3: 1$ | 3.973 | 5.196 |
| 5 | UNIV OF WASHINGTON | 56.535 | 49.576 | 36.079 | 127 | 709 | 9.795 | 2.334 | 533 | 61959 |
| 6 | STANFORO LNIV | 54.648 | 52.280 | 41.786 | 0 | 211 | 8.084 | 916 | 1.283 | 2,368 |
| 7 | HARVARD UAIV | 54.037 | 50.119 | 37.109 | 215 | 15 | 11.320 | 968 | 492 | 3,918 |
| 8 | UNIV OF CAL LOS ANGELES | 54.030 | 47.574 | 36.825 | 553 | 29 | 7.728 | 998 | 1.441 | B, 456 |
| 9 | UNIV OF CAL BERKELEY | 52.279 | 46.725 | 32.979 | 37 | 20 | 6.995 | 667 | 6.027 | 5.554 |
| 1.0 | COLUMBIA LNIV | 52,219 | 47.450 | 37,589 | 191 | 648 | 8.111 | 851 | 60 | 4.769 |
|  | TOTAL LST 10 INSTS. | 604.057 | 531.988 | 400,295 | 5,395 | 2.093 | 83,292 | 11.439 | 21.474 | 72,069 |
| 11 | HOWARE UNIV | 51,543 | 3.361 | 1.807 | 0 | 0 | 1.351 | , 7 | 106 | 48.182 |
| 12 | UNIV OF CAl SAN OIEGO | 49.650 | 47.553 | 36.593 | 4,900 | 2.015 | 2.868 | 1.187 | 50 | 2.097 |
| 13 | JOHNS MOPKINS UNIV | 45.548 | 39.070 | 28.955 | 35 | 95 | 8.762 | 852 | 371 | 6.478 |
| 14 | UNIV OF ILLINOIS-URBAAA | 44.244 | 41.538 | 31.331 | 426 | 7 | 3.937 | 376 | 5.461 | 2.706 |
| 15 | OHIO STATE UNIV | 42.160 | 32.119 | 15,546 | 0 | 0 | 4.242 | 574 | 11.757 | 10,041 |
| 16 | UNIY OF PENNSYLVANIA | 41,385 | 36.405 | 25,241 | 62 | 52 | 8,561 | 2.387 | 102 | 4.980 |
| 17 | CORNELL Unly | 41,369 | 38.953 | 23.893 | 2,744 | 10 | 5,515 | 820 | 5.963 | 2.414 |
| 18 | NEW YORK LNIV | 40.496 | 29.866 | 20.780 | 91 | 35 | 8.217 | 639 | 101 | 10.630 |
| 19 | Yale Univ | 38.400 | 33.572 | 23.992 | 258 | 0 | 7.919 | 2.198 | 105 | 4.828 |
| 20 | UNIV OF CHICAGO | 37.819 | 34.615 | 26:479 | 202 | 0 | 7,345 | 551 | 38 | 3.204 |
|  | TOTAL IST 20 INSTS. | 1.036 .669 | 869.040 | 642.012 | 14.113 | 4.318 | 141.959 | 21.110 | 45.526 | 167.629 |
| 21 | UNIV OF CCLORADO | 32,720 | 24.141 | 16.447 | 35 | 0 | 4,937 | 1.870 | 852 | 8.579 |
| 22 | UNIV OF SCUTHEAN CAL | 30.733 | 21.341 | 14,978 | 413 | 499 | 4.671 | 544 | 236 | 9,392 |
| 23 | UNIV OF N C AT CHAP HILL | 30.321 | 24.838 | 16.160 | 6 | 0 | 6.149 | 2.297 | 226 | 5.483 |
| 24 | DUKE UNIV | 29.157 | 25.509 | 16.714 | 223 | 413 | 6.210 | 1.155 | 794 | 3.640 |
| 25 | WASHINGTOA UNIV | 28.480 | 25.226 | 13.224 | 0 | - | 6.151 | 836 | 15 | 3.258 |
| 26 | UNIV OF CAL SAA FRANCISCO | 26,906 | 22,775 | 16.064 | 142 | 0 | 6,054 | 494 | 21 | 4.131 |
| 27 | MICHIGAN STATE UNIV | 26.810 | 20.314 | 10.957 | 295 | 0 | 3,746 | 617 | 4.709 | 6.496 |
| 28 | UNIV CF UTAH | 26,072 | 18.198 | 12.786 | 252 | 0 | 3,787 | 1.234 | 130 | 7.874 |
| 29 | UNIV OF PITTSBURGH | 25,931 | 17.990 | 10.984 | 38 | 0 | 5,580 | 671 | 717 | 7.941 |
| 30 | UNIV OF RCCNESTER | 25.497 | 22,906 | 16.633 | 258 | 64 | 4,517 | 1,375 | 59 | 2.591 |
|  | TOTAL IST 30 INSTS. | 1.319.296 | 1.092.278 | 791,959 | 15.765 | 5.294 | 193.761 | 32.203 | 53.296 | 227.01 |
| 31 | YESHIVA UAIV | 24.926 | 20.413 | 14.458 | 0 | 0 | 5,433 | 514 | \% | 4,513 |
| 32 | UNIV OF ICHA | 24.914 | 17.878 | 10.798 | 0 | 0 | 3.944 | 2.383 | 753 | 7.036 |
| 33 | UNIV OF TEXAS AT AUSTIN | 24.666 | 20.237 | 14,116 | 20 | 190 | 3,323 | 1.918 | 670 | 4.429 |
| 34 | PENNSYLVAAIA STATE UNIV | 24.629 | 21.260 | 12.386 | 25 | 167 | 2.428 | 497 | 5.767 | 3.369 |
| 35 | PURDUE UNIV | 24,443 | 22.280 | 14,728 | 21 | 53 | 2.593 | 817 | 4.068 | 2.163 |
| 36 | UNIV OF FLORIDA | 23.357 | 18.723 | 10,368 | 41 | 19 | 4.736 | 494 | 3.065 | 4.634 |
| 37 | CASE WESTERK RESERVE UNIV | 22.979 | 19,240 | 12.259 | 15 | 0 | 6.310 | 595 | 61 | 3.739 |
| 38 | UNIV OF MIAMI | 22.848 | 16.649 | 12.424 | 14 | 1.260 | 2,392 | 441 | 116 | 6.199 |
| 39 | UNIV OF MISSOURI COLURBIA | 22.348 | 15,986 | 7.343 | 840 | 1.5 | 2,914 | 649 | 4.235 | 6.362 |
| 40 | NORTHWESTERN UNIV | 22.245 | 16,148 | 11.052 | 0 | 57 | 4,415 | 503 | 121 | 6.097 |
|  | TOTAL IST 40 INSTS, | 1,556.651 | 1.281.092 | 911.891 | 16.741 | 7.045 | 232.249 | $41: 004$ | 72.162 | 275,559 |
| 41 | CAL INST CF TECH | 20.490 | 20.456 | 17,074 | ${ }^{0}$ | 290 | 1.633 | 1.420 | 39 | 34 |
| 42 | TEXAS A EM UNIV | 20.4\% | 19.425 | 9.48K | 145 | 329 | 443 | 668 | 8.354 | 1.054 |
| 43 | LA ST U MED CT SHREVEPORT | 20,475 | 4.353 | - ${ }^{3}$ | 4.958 | 9 | ${ }^{0}$ | 0 | 0 | 15.517 |
| 44 | U OF ALA IN GIRHINGHAY | 19.516 | 10.970 | A. 823 | 0 | 11 | 1,525 | 572 | 19 | 8,546 |
| 45 | RUTGERS UNIVERSITY | 19.489 | 14,537 | 8.143 | 13 | 44 | 2,356 | 1.419 | 2.56\% | 4.952 |
| 46 | UNIV OF HAWAII | 19.011 | 14.351 | 11.021 | 28 | 724 | 1.295 | 395 | 888 | 4.660 |
| 47 | UNIV OF KENTUCKY | 18.701 | 14.070 | 7.243 | 0 | 182 | 1,908 | . 356 | 4.481 | 4.631 |
| 48 | N C StATE UNIV AT RALEIGH | 18.174 | 17.377 | 7.269 | 70 | 127 | 908 | 1.261 | 7.747 | 797 |
| 49 | UNIV OF CAL Davis | 28,14i | 14.784 | 11.408 | 222 | 470 | 1.754 | 890 | 40 | 3,357 |
| 50 | UNIV OF ARIZONA | 18.100 | 14.077 | 10.148 | 28 | 10 | 2,152 | 256 | 1.483 | 4.023 |
|  | TOTALL LST 50 InStS. | 1.749.227 | 1.426 .097 | 1.002.506 | 22.205 | 0.227 | 246.123 | 48.261 | 97.775 | 3<3.130 |
| 51 | ST LOUlS LNIV | 18,044 | 0.737 | 4.504 | 335 | 0 | 1.268 | 251 | 109 | 11.307 |
| 52 | TEMPLE UNIV | 17.647 | 11.497 | 3.735 | 0 | ก | 2.117 | 482 | 73 | 6.240 |
| 53 | IOWA ST U OF SCIENCESTECH | 17,369 | 9.587 | 4.676 | 462 | 37 | 768 | 240 | 3.411 | 7.782 |
| 54 | UNIV OF KANSAS | 17.130 | 12.513 | 7.847 | 3 | 0 | 3.419 | 1.152 | 10 C | 4.617 14.498 |
| 55 | MEHARRY MEDICAL COL | 15.883 | 2.385 | 1.627 | 0 | 0 | 676 | 80 | 2 | 14.498 |
| 56 | UNIV OF ME COLLEGE PARK | 13.877 | 14,918 | 10.389 | 54 | 13 | 1,182 | 1.237 | 2.043 | 1.959 |




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| 41 CAL INST CF TECh <br> 42 TEXAS A $M$ UNIV <br> 43 LA ST U MEC CT SHREVEPJRT <br> 44 U OF AbA IJ HIRMINGHAT <br> IS RUTGERS UNIUERSITY |  |
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| 46 UnIV of hamall <br> 47 UNIV CF KENTUCKY <br> as n state univ at raleigh <br> 49 unlv or Cal．davis <br> so UNIV EF AEIZONA |  |
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| 56 UNIV OH ME COLLEGE PARK <br> 57 UNIV OF GEORGIA <br> 58 baylop col of medicine <br> 59 VANDEREILT UNIV <br> 60 U fex Sn red sch gallas |  |
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| Rank | institutgon prankec By AMOUNT RECEIVEDS |
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| 04 | UNIV OF MEW MExICO |
| 85 | OKLAROMA STATE UNIV |
| 86 | AUBURK UNIV |
| 87 | CUNY MI Sinal sch of red |
| 08 | UNIV OF OEECTON - EUGEAE |
| $\begin{aligned} & 89 \\ & 90 \end{aligned}$ | UNIV CF HISSOURI KAN CITY |
| 02 | univ or mi baltimore |
| 92 | carnegie rellon univ |
| 93 | U TEX houston med semcel |
| 94 | U Of tenn med units mempa |
| 95 | la st unit baton rouge |
| 96 | kansas stape unjv |
| 97 | UNIV Of Mass amherst |
| 98 | UNIV of nebraska-lincelw |
| ${ }^{99}$ | floriba stape univ |

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| 212223 | UNIV OF N C AT Chap HILL |
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| 25 | UnIV of cal san francisco |
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| 27 | UNIV OF SCUTHERN CAL |
| 28 | PENNSYLVAAIA State univ |
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| 30 | YESHIVA UAIV. |
| 31 | MICHIGAN STATE UNIY |
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|  | TEXAS A \% M UNIV |
| 3435 | CASE KESTERN RESERVE UNIV |
|  | UNIV OF FLORIDA |
| 36 | UNIV OF UPAH |
| 3738 | UNIV OF PITTSEURGH |
|  | UNIV OF ICWA |
| 38 | n C State univ at raleigh |
| 38 40 | UNIV OF MIAMI |
| 41 | NORYHNESTERN UAIV |
| 42 | UNIV OF MISSOURI COLUMBIA |
| 43 | PRINCETON UNIV |
| 44 | UNIV OF MC COLLEGE PARK |
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| 60 | TEMPLE UNIV |
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| 65 | carnegie mellon univ |
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| 68 | IOWA ST U OF SCIENCESTECH |
| 69 | NEH MEXICC STATE UNIV |
| 70 | OKLAHOMA STATE UNIV |
| 71 | UNIV of ARK |
| 72 | ENORY UNIV |
| 73 | AUBURN UNIV |
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| 75 | GEORGE WASHINGTON UNIV |

Pable b-11
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| :---: | :---: |
| Rank | institution tranked by anOUNT RECEIVEDI |
| 76 | UnIV of cennecticut |
| 77 | UNIV OF OREGON - EuGEAE |
| 78 | florioa state univ |
| 79 | virginia polytechnic inst |
| AO | Rockefeller UNIV |
|  | UNIV of ${ }^{\text {a }}$ A $S_{\text {K }}{ }^{\text {a }}$ |
|  | QROWN UNIV |
| A3 | WEST VIRGINIA UNIV |
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| 85 | OARTMOUTH COL |
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| 87 | UNIV OF OKLAMOMA |
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| 93 | UTAH STATE UNIV |
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| of georgia last of tech <br> 97 ST LOUIS LNIV <br> O8 UNIV OF NEBRASKA-LIACCLN <br> 09 TUFTS UnIV <br> 100 GLEMSON UAIV |  |
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27 UNI OF SOUYHERN CAL
28 PURDE UNIV
29 YEESHVA UNIV
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31 PRINCE PON UNIV
32 UNIV OF UTAH
33 UNIV OFIANI
34 PENNYLVANIA STATE UNIV
35 CASE WESTERN RESERYE UNIV 36 UNIV OF CAL DAVIS
37 HOODS HOLE OCEANINST
38 BAYLOR COL OF MEDICINE
39 NOPHUESTERN UNIV 39 NORTHWESTERN UN！
40 UNIV OF HAWA！？  ..... 51 U OF ALA IN BIRMINGHAM
S2 TEMPLE UNIVIVERITY
53 RUTGERS UNIVERSITY
54 UNIV OF KANSAS
 







Taple b-12
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| $\begin{aligned} & \text { TABLE } \\ & \text { CONTI } \end{aligned}$ | $\begin{aligned} & \text { B-12 } \\ & \text { NUED } \end{aligned}$ |
| :---: | :---: |
| Rank | instipution inanked BY AMOUNP RECEIVEDI |
| $\begin{aligned} & 76 \\ & 78 \\ & 78 \\ & 79 \\ & 80 \end{aligned}$ | upah state univ <br> UNIV OF MD - BALTIMDRE EMORY UNIV <br> u tex sw med sch gallas <br> UNIV OF CONNECTICUY |
| $\begin{aligned} & 81 \\ & 82 \\ & 83 \\ & 84 \\ & 65 \end{aligned}$ | univ of tenn ap knoxville <br> SUNY ST U ALBANY <br> RICE UNIV <br> IOWA SY U OF sCiENCESPECH purts univ |
| $\begin{aligned} & 86 \\ & 87 \\ & 88 \\ & 89 \\ & 90 \end{aligned}$ | sp LOUIS UNIV <br> ba sp univ bayon rouge UNIV OF HASS ANHERS? ILLINOIS INST OH TECH UNIV OF NEW MExICO |
| $\begin{aligned} & 01 \\ & 92 \\ & 93 \\ & 94 \\ & 93 \end{aligned}$ | SUNY 5P U SPONy GRODK UNIV OF CINCINNATI dxlahoma state univ hayne stape univ UNIV OF DAYTON |
| $\begin{array}{r} 96 \\ 07 \\ 98 \\ 98 \\ 100 \end{array}$ | geongefohn univ DARTHOUTH COL <br> UNIV OF OKLA HOMA <br> VIRGINIA POLYPECHNIC inst <br> U DF PENN MED UNITS MEMPH |


TABLE B－13

| ISDA | AEC | CON |
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|  | WAYNE STATE UNIV | 2,318 | 0 | 0 | 0 | $\begin{aligned} & 0 \\ & 0 \end{aligned}$ | $0$ | $\begin{array}{r} 15 \\ 0 \end{array}$ | $\begin{array}{r} 2,164 \\ 1,978 \end{array}$ | $\begin{aligned} & 0 \\ & 0 \end{aligned}$ | $\begin{array}{r} 0 \\ 0 \end{array}$ | $\begin{aligned} & 139 \\ & 229 \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \end{aligned}$ | 0 0 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | DUKE UNIV | 0.210 | 0 | 0 | 4 | 0 | 0 |  | 6,013 | 0 | 0 | 197 | 0 | $v$ |
|  | WASHIAGTOA UNIV | 6.151 | 0 | 0 | 0 | 0 | 0 | 0 | 5,902 | 0 | 0 | 240 | 0 | 9 |
| 18 | UNIV OF N C AT Chap mill | 6.149 | 0 | 0 | 0 | 0 | 0 | 173 | 5,640 | 0 | 0 | 336 | 0 | 4 |
| 19 | UNIV OF CAL SAN FRANCISCO | 6.054 | 0 | 0 | 0 | 0 | 0 | 0 | 6,018 | 0 | 0 | 36 | 0 | 0 |
| 20 | UNIV OF PITTSBURGH | 5.580 | 0 | 5 | 0 | 0 | 0 | 183 | 5,033 | 0 | 0 | 211 | 148 | 0 |
| 21 | CORNELL UAIV | 5.515 | 0 | 27 | 0 | 0 | 0 | 84 | 4.569 | 0 | 0 | 835 | 0 | 0 |
| 22 | YESHIVA UAIV | 5.433 | 0 | 0 | 0 | 0 | 0 | 0 | 5,382 | 0 | 0 | 51 | 0 | 0 |
| 23 | UNIV OF CClorado | 4.937 | 0 | 10 | 0 | 0 | 0 | 70 | 4.444 | 0 | 0 | 410 | 0 | 3 |
| 24 | UNIV OF FLORIOA | 4.736 | 0 | 45 | 0 | 0 | 0 | 276 | 4.148 | 0 | 0 | 267 | 0 | 0 |
| 25 | UNIV OF SCUTHERN CAL | 4.671 | 0 | 0 | 0 | 0 | 0 | 129 | 4.350 | 0 | 0 | 128 | 0 | 13 |
|  | BOSTON UNIV | 4.569 | 0 | 0 | 0 | 0 | 0 | 9 | 4.460 | 0 | 0 | 109 | 0 | 0 |
| 27 | UNIV OF RCCHESTER | 4.517 | 0 | 96 | 0 | 0 | 0 | 0 | 4. 202 | 0 | 0 | 209 | 0 | 10 |
| 28 | MASS INS ${ }^{\text {P OF TECH }}$ | 4,507 | 0 | 183 | 0 | 0 | 0 | 86 | 2.288 | 0 | 0 | 1.785 | 148 | 47 |
| 29 | NORTHWESTERN UNIV | 4,415 | 0 | 14 | 0 | 0 | 0 | 203 | 3,648 3,540 | 0 | 0 | 402 526 | 148 | - 2 |
| 30 | OHIO STATE UNIV | 4.242 | 0 | 61 | 0 | 0 | 0 | 73 | 3,540 | 0 | 0 | 526 | 0 |  |
| 31 | UNIV OF ICWA | 3.944 | 0 | 2 | 0 | 0 | 0 | 91 | 3.462 | 0 | 0 | 243 | 146 | 0 |
| 32 | UNIV OF ILLINOIS-URBAAA | 3.937 | 0 | 89 | 0 | 0 | 0 | 217 | 2.878 | 0 | 0 | 753 | 0 | 0 |
| 33 | UNIV OF UTAH | 3.787 | 0 | 5 | 0 | 0 | 0 | 59 | 3.527 | 0 | 0 | 106 | 0 | 0 |
| 34 | MICHIGAN STATE UNIV | 3.746 | 0 | 8 | 0 | 0 | 0 | 39 | 3.148 | 0 | 0 | 551 | 0 | 0 |
| 35 | UNIV CF KANSAS | 3.411 | 0 | 40 | 0 | 0 | 0 | 69 | 3.103 | 0 | 0 | 190 | 0 | 0 |
| 36 | UNIV Of TEXAS AT AUSTIV | 3.323 | 0 | 49 | 0 | 0 | 0 | 95 | 2.735 | 0 | 0 | 444 | 0 | 0 |
| 37 | UNIV of CINCINNATI | 3.111 | 0 | 1 | 0 | 0 | 0 | 117 | 2.694 | 0 | 0 | 99 | 0 | 0 |
| 38 | TULANF UNIV | 3.026 | 0 | 0 | 0 | 0 | 0 | ? | 2.896 | 0 | 0 | 130 | 0 | 0 |
| 39 | VANDERBILT UNIV | 3.018 | 0 | 26 | 0 | 0 | 0 | 13 | 2.814 | 0 | 0 | 165 | 0 | 0 |
| 40 | UNIV Of VIRGINIA | 2.936 | 0 | 72 | 0 | 0 | 0 | 0 | 2.733 | 0 | 0 | 131 | 0 | 0 |
| 41 | UNIV OF M, SSOUR ${ }_{\text {S }}$ COLUPBIA | 2.914 | 0 | 19 | 0 | 0 | 0 0 | 18 | 2,642 2,689 | 0 | 0 | 235 167 | 0 | 19 19 |
| 42 | SUNY ST U BUFFALO | 2.875 | 0 | 0 | 0 | 0 | 0 | 0 | 2,089 | 0 | 0 | 167 | 0 | 10 |
| 43 | UNIV OF CAL SAN DIEGC | 2,908 | 0 | 0 | 0 | 0 | 0 | 0 | 2.481 | 0 | 0 | 327 | 0 | 0 |
| 44 | EMORY UNIV | 2.676 | 0 | 85 | 0 | 0 | 0 | 155 | 2,556 1,782 | 0 | 0 | 120 571 | 0 | 0 |
| 45 | PURDUE UNIV | 2.593 | 0 | 85 | 0 | 0 |  |  |  |  |  |  |  |  |
| 46 | UNIV OF OKLAMOMA OT MED | 2,568 | 0 | 0 | 0 | 0 | 0 | 190 | 2,130 | 0 | 0 | 240 | 0 | 0 |
| 47 | Cuny mi sinal Sch of med | 2.437 | 0 | 0 | 0 | 0 | 0 | 0 | 2.432 | 0 | 0 |  | 0 | 0 |
| 48 | PENNSYLVAAIA STATE UVIV | 2.428 | $00^{\circ}$ | 40 | 2 | 0 | 0 | 298 | 1,638 | 0 | 0 | 452 176 | 0 | 0 |
| 49 | UNIV OF MIAMI | 2,392 | 0 | 0 | 0 | 0 | 0 | 0 | 2.216 | 0 | 0 | 176 | 0 | 0 |
| 50 | RUTGERS UAIVERS:TY | 2.356 | 0 | 13 | 0 | 0 | 0 | 189 | 1,886 | 0 | 0 | 254 | 0 | 14 |
| 51 | mayne state univ | 2.318 | 0 | 0 | 0 | 0 | 0 | 15 | 2,164 | 0 | 0 | 139 | 0 | 0 |
|  | UNIV OF OREGGON - EUGENE | 2. 207 | 0 | 0 | 0 | 0 | 0 | 0 | 1,978 | 0 | 0 | 229 | 0 | 0 |
| 53 | ' BAYLOR COL OF MEDICINE | 2,161 | 0 | 0 | 0 | 0 | 0 | 4 | 2.149 | 0 | 0 | 12 | 0 | 0 |
| 54 | UNIV OF CCRNECTICUP | 2,156 | 0 | 0 | 0 | 0 | 0 | 44 | 1.948 | 0 | 0 | 164 | 0 |  |
| 55 | UNIV OF ARIZONA | 2.152 | 0 | 27 | 0 | 0 | 0 | 54 | 1,775 | 0 | 0 | 296 | 0 | 0 |
| 56 | Florida state univ | 2.144 | 0 | 3 | 0 | 0 | 0 | 0 | 1.759 | 0 | 0 | 218 | 152 | 12 |
| 57 | U TEX SH HED SCH DALLAS | 2.134 | 0 | 0 | 0 | 0 | 0 | 0 | 2,134 | 0 | 0 | ${ }^{0}$ | 0 | 0 |
| 58 | TEMPLE UNIV | 2.117 | 0 | 11 | 0 | 0 | 0 | 20 | 2.034 1.670 | 0 | 0 | 63 402 | 0 | 11 |
| 59 | INOIANA UAIV-BLOOMINGION | 2.094 | 0 | 11 | 0 | 0 | 0 | 5 | 1.670 1.600 | 0 | 0 | 275 | 159 | 9 |
| 60 | SYRACUSE LNIV | 2.045 | 0 | 0 | 0 | 0 | 0 | 5 | 1,600 | 0 | 0 | 275 | 159 | 。 |
| 61 | TEACHERS COL | 1.963 | 0 | 0 | 0 | 0 | 0 | 0 | 1.949 | 0 | 0 | 14 | 0 | 0 |
| 62 | WEST VIRGINIA UNIV | 1.91 n | 0 | 0 | 0 | 0 | 0 | 300 | 1.480 | 0 | 0 | 138 | 0 | 0 |
| 63 | UNIV OF TENN AT KNOXVILLE | 1.818 | 0 | 117 | 0 | 0 | 0 | 18 | 1.429 | 0 | 0 | 244 | 0 | 10 |
| 64 | UNIV OF KENTUCKY | 1.808 | 0 | 18 | 0 | 0 | 0 | 173 | 1,496 | 0 | 0 | 121 | 0 | 0 |
| 65 | UNIV OF ME BALTIMORE | 1.807 | 0 | 0 | 0 | 0 | 0 | 0 | 1.007 | 0 | 0 | 0 | 0 | 0 |
| 66 | UNIV OF CAL OAVIS | 1.754 | 0 | 32 | 0 | 0 | 0 | 78 | 1.409 | 0 | 0 | 235 | 0 | 0 |
| 67 | Va COmmonhealir univ | 1.712 | 0 | 0 | 0 | 0 | 0 | 0 | 1.696 | 0 | 0 | 16 | 0 | 0 |
| 68 | UNIV OF ILLINOIS-MED CYR | 1.693 | 0 | 0 | 0 | 0 | 0 | 0 | 1.680 | 0 | 0 | 13 | 0 | 0 |
| 69 | INOIANA UAIV-INDIANAPCLIS | 1.686 | 0 | 0 | 0 | 0 | 0 | 0 | 1.686 | 0 | 0 | 0 | 0 | 0 |
| 70 | CAL INST CF TECH | 1.633 | 0 | 7 | 0 | 0 | 0 | 52 | 906 | 0 | 0 | 668 | 0 | 0 |
| 71 | brandels liniv | 2.612 | 0 | 0 | 0 | 0 | 0 | 0 | 1.486 | 0 | 0 | 118 | 0 | * |
| 72 | U OREGON MEDICAL SCHOCL | 1.601 | 0 | 0 | 0 | 0 | 0 | 0 | 1.601 | 0 | 0 | 0 | 0 | 0 |
| 73 | U OF ALA IN BIRMINGHAM | 1.525 | 0 | 0 | 0 | 0 | 0 | 0 | 1.511 | 0 | 0 | 714 | 0 | 0 |
| 74 | PRINCEYON UNIV | 1.470 | 0 | 0 | 0 | 0 | 0 | 4 | 740 | 0 | 0 | 719 | 0 | 7 |
| 75 | GEORGEYOWA UNIV | 1.393 | 0 | 0 | 0 | 0 | 0 | 0 | 1.327 | 0 | 0 | 66 | 0 | 0 |


| TANK | INSTITUPION (RANKED BY AMOUNT RECEIVED) | TOTAL | USDA | AEC | COH | DOD | OEO | EPA | HEW | INT | NASA | NSF | DOT | OTMER |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 76 | HOWARD UNIV | 1.361 | 0 | 0 | 0 | 0 | 0 | 33 | 1,276 | 0 | 0 | 40 | 0 | 12 |
| 77 | UNIV OF GEORGIA | 1.335 | 0 | 9 | 0 | 0 | 0 | 7 | 1,080 | 0 | 0 | 239 | 0 | 0 |
| 78 | UNIV OF , ARK | 1.303 | 0 | 0 | 0 | 0 | 0 | 55 | 1,140 | 0 | 0 | 108 | 0 | 0 |
| 79 | UNIV OF HAwA!! | 1.295 | 0 | 0 | 0 | 0 | 0 | 73 | 980 | 0 | 0 | 242 | 0 | 0 |
| 80 | SUNY DOWNSTATE MED CTR | 1.287 | 0 | 0 | 0 | 0 | 0 | 0 | 1,281 | 0 | 0 | 6 | 0 | 0 |
| 81 | ST LOUIS ENIV | 1.268 | 0 | 0 | 0 | 0 | 0 | 0 | 1.189 | 0 | 0 | 69 | 0 | 10 |
| 82 | GEORGE WASHINGTON UAIV | 1.267 | 0 | 0 | 0 | 0 | 0 | 0 | 1.190 | 0 | 0 | 74 | 0 | 3 |
| 83 | U OF TENN MEE UNITS MEMPN | 1.254 | 0 | 20 | 0 | 0 | 0 | 0 | 1,210 | 0 | 0 | 24 | 0 | 0 |
| 84 | BOSTON COL | 1.252 | 0 | 0 | $\checkmark$ | 0 | 0 | 0 | 1,195 | 0 | 0 | 49 | 0 | 8 |
| 85 | THOS JEFFEHSON UNIV MCSP | 1.239 | 0 | 0 | 0 | 0 | 0 | 0 | 1,216 | 0 | 0 | 23 | 0 | 0 |
| 86 | UNIV OF P R SAN JUAN | 1.236 | 0 | 0 | 0 | 0 | 0 | 0 | 1,236 | 0 | 0 | 0 | 0 | 0 |
| 87 | TUFTS UNIV | 1.188 | 0 | 0 | 0 | 0 | 0 | 63 | 1.039 | 0 | 0 | 86 | 0 | 0 |
| 88 | UNIV Of me college park | 1.182 | 0 | 2 | 0 | 0 | 0 | 85 | 742 | 0 | 99 | 254 | 0 | 0 |
| 89 | UNIV Of NEW MEXICO | 1.175 | 0 | 60 | 0 | 0 | 0 | 0 | 996 | 0 | 0 | 119 | 0 | 0 |
| 90 | UNIV OF VERMDNT | 1,163 | 0 | 0 | 0 | 0 | 0 | 0 | 1,094 | 0 | 0 | 69 | 0 | 0 |
| 91 | U Of Ala in tuscaloosa | 1.142 | 0 | 0 | 0 | 0 | 0 | 49 | 895 1.009 | 0 | 107 | 127 | 0 | 0 |
| 92 | DARTMOUTH COL IRUINE | 1.136 | 0 | 0 | 0 | 0 | 0 | 0 | 1,009 1.014 | 0 | 0 | 127 103 | 0 | 0 |
| 94 | UNIV CF LEUISVILLE | 1,880 | 0 | 0 | 0 | 0 | 0 | 0 | 1,022 | 0 | 0 | 58 | 0 | 0 |
| 95 | HAhNETANN MED COL HCSP | 1,069 | 0 | 0 | $\checkmark$ | 0 | 0 | 0 | 1.011 | 0 | 0 | 50 | 0 | 0 |
| 96 | UNIV OF HISSISSIPPI | 1,735 1,008 | 0 | 0 | 0 | 0 | 0 | 0 | 919 749 | 0 | 0 | 2180 | 0 | $11^{0}$ |
| 98 | UNIV OF DENVER | 988 | 0 | 0 | 0 | 0 | 0 | 0 | 902 | 0 | 0 | 86 | 0 | 0 |
| 99 | CATHOLIC LNIV OF AMERICA | 966 | 0 | 0 | 0 | 0 | 0 | 0 | 864 | 0 | 0 | 102 | 0 | 0 |
| 100 | WAKE FOREST UNIV | 963 | 0 | 1 | 0 | 0 | 0 | 0 | 908 | 0 | 0 | 54 | 0 | 0 |

TABLE B-13
CONTINUED

$$
100
$$

| Rank | institution cranked by amount receiveds | TOTAL | USD4 | AES | COM | DOD | QEO | FDA | NEW | 10:7 | VASA | Asf | DOT | CTMER |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | total. all institutions | 99,569 | 0 | 0 | 221 | 0 | $n$ | 0 | 40,209 | 1.138 | 0 | 56.892 | 0 | 1.209 |
|  | topal. 100 Instituticns | 75,981 | 0 | 0 | 221 | 0 | , | 3 | 34,027 | 533 | 0 | 40.490 | 0 | 702 |
| 1 | Univ of pennsylvania | 2,387 | , | 0 | 0 | 0 | 0 | 0 | 759 | 0 | 0 | 1.029 | 0 | 0 |
|  | UNIV OF ICHA | 2.303 | 0 | 0 | 0 |  | 0 | , | 498 | 0 | 4 | 1.885 | 0 | 0 |
| 3 | UNIV OF mashingion | 2,334 | 0 | $n$ | 0 | 0 | 0 | 2 | 657 | 0 | 0 | 1.677 | 0 | 0 |
| 4 | UNIV OF WISCONSIN MADISOV | 2,311 | 0 | 0 | 0 | 0 | 0 | 0 | 550 | 33 | 0 | 1.728 | 0 | 0 |
| 5 | UNIV OF N C At chap mill | 2,297 | 0 | 0 | 7 | 0 | 0 | 0 | 625 | 0 | 0 | 1.672 | 0 | 0 |
| 7 | Yale univ carnegie rellon univ | 2.198 2.112 | 0 | 0 | 3 | 0 | 0 | 0 | 579 40 | 0 | 0 | 1.019 2.072 | 0 | 0 |
| 8 | univ of Pexas at austiv | 1,918 | 0 | 0 | 0 | 0 | 0 |  | 91 | 0 | 0 | 1,021 | 0 | 0 |
| 9 | UNIV of celorado | 1,870 | 0 |  | 53 |  | 0 | 0 | 870 | 0 | 0 | 947 | 0 | 0 |
| 10 | tulane univ | 1,438 | 0 | 0 | 0 | 0 | 0 | 0 | 36.) | 0 | 0 | 1,070 | 0 | 0 |
| 11 | CAL JASt CF TECH | 1.420 | 0 | 0 | 0 | 0 | 0 | 7 | 116 | 0 | 0 | 1.304 | 0 | 0 |
|  | RUTEERS UAIVERSITY | 1.419 | 0 | 0 | 0 | 0 | 0 | 0 | 281 | 32 | 0 | 1.106 | 0 | 0 |
| 13 | Suny Sy u algany | 1.418 | 0 | 0 | 0 | 0 | 0 | 3 | 54 | 0 | 0 | 1.364 | 0 | 0 |
| i4 | UNIV OF RECCEESTER | 1.375 | 0 | 0 | 0 | $?$ | ? | $n$ | 390 | 0 | 0 | 485 | 8 | 8 |
| 15 | n ci state univ at raleigm | 1,201 | - | 0 | 0 | 0 | n | 0 | 70 | 18 | 0 | 1,135 | 0 | 38 |
| 16 | UniV of me college park | 1,237 | 0 | 0 | 0 | 0 | 0 | C | 45 | 19 | 0 | 1.173 | 0 | 0 |
| 17 | UNIV OF UTAM | 1,234 | 0 | 0 | 0 | 0 | 0 | , | 336 | 0 | 0 | 813 | 0 |  |
| 16 | univ of cal san diegc | 1.187 | 0 | 0 | $\checkmark$ | 0 | 0 | 5 | 405 | 0 | 0 | 182 | 0 | 0 |
| 19 | DUKE UNIV | 1.155 | 0 | 0 | $?$ | 0 | 0 | 0 | 1.041 | 0 | 0 | 114 | : | 0 |
| 20 | Univ of kansas | 1.152 | 0 | 0 | 0 | 0 | c | 0 | 1,032 | 0 | 0 | 120 | 9 | 0 |
| 21 | UNIV OF M NNESOTA | 1.031 | , | 0 | 0 | 0 | 9 | 0 | 703 | 29 | 0 | 299 | 0 | 0 |
| 22 | UNIV OF NCTRE DAME | 1.028 | 0 | 0 | 0 | 0 | 0 | ? | $7{ }^{8} 7$ | 0 | 0 | Y48 | 0 |  |
| 23 | UNIV OF CAL los angeles | 998 | 0 | 0 | 0 | 0 | 0 | 9 | 710 | 5 | 0 | 190 | 0 | 85 |
| 24 | univ of michigan | 987 | 0 | 0 | 0 | 0 | $?$ | 0 | 817 | 0 | 0 | 170 | 0 | 0 |
| 25 | harvard univ | 968 | 0 | 0 | 0 | 0 | 0 | 1 | 854 | 0 | 0 | 114 | 0 | 0 |
| 26 | EmORY UNIV | 044 | 0 | 0 | 0 | 0 | 0 | 0 | 345 | 0 | 0 | 599 | - | 0 |
| 27 | STANF ORD LAIV | 916 | 0 | 0 | 0 | 0 | n | 0 | 467 | 0 | 0 | 449 | 0 | 0 |
| 28 | UNIV OF CAL DAVIS | 890 | 0 | 0 | 0 | 0 | n | 9 | 803 700 | 0 | 0 | 77 152 | 0 | $\bigcirc$ |
| 29 30 | JOHNS HOPKINS UNIV COLUMEIA LiNIV | 852 851 | 0 | 0 | 0 | 0 | 0 | , | 700 659 | 0 | 0 | 152 192 | 0 | 0 |
| 30 | COLUMBIA LINIV |  | 0 | 0 | 0 | 0 | 0 | 0 | 659 | 0 | 0 | 192 | 0 | 0 |
| 31 | mashington univ | 836 | 0 | 0 | 0 | 0 | 0 | 5 | 752 | 0 | 0 | 84 | 0 | 0 |
| 32 | VANDERBILT UNIV | 834 | 0 | 0 | 0 | 0 | 0 | 0 | 783 | 0 | 0 | 51 | 0 | 0 |
| 33 | CORNELL UNIV | 820 | 0 | 0 | 0 | 0 | 0 | $?$ | 514 | 37 | 0 | - 190 | 0 | 79 |
| 34 | PURDUE UNI' | 817 | 0 | 0 | 0 | 0 | 0 | 0 | 584 | 21 | 0 | 212 672 | $\bigcirc$ | $0{ }^{\circ}$ |
| 35 | SOUTHERN PETHODIST UNIV | 757 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 | 672 | 0 | 05 |
| 36 | WASHINGTOA STATE UNIV | 748 | 0 | n | 0 | 0 | $?$ | 0 | 111 | 28 | 0 | 079 | 0 | 0 |
| 37 | UNIV OF OREGON - EUGEAE | 711 | 0 | 0 | 0 | 0 | 0 | 0 | 418 | ${ }^{\circ}$ | 0 | 200 | 0 | 3 |
| 36 | UNIV OF MASS AMHERST | 692 | 0 | 0 | 0 | 0 | 0 | 0 |  | 25 | 0 | 667 | 0 | $\bigcirc$ |
| 39 | UNIV OF PITTSSAURGH | 671 606 | 0 | 0 | 0 | 0 | 0 | , | 549 85 | 32 | 0 | 122 | 0 | 0 |
| 40 | TEXAS A 6 UNiV | 668 | 0 | 0 | 0 | 0 | 0 | \% | 85 | 32 | 0 |  | 0 | 0 |
| 41 | UNIV OF CAb Berkeler | 667 | 0 | 0 | 0 | 0 | 0 | 0 | 326 | 0 | 0 | 341 | 0 | 0 |
| 42 | UNIV OF MISSOUR! COLUMBIa | 049 | 0 | 0 | 0 | 0 | 0 | 0 | 305 | 21 | 0 | 239 | 0 | 84 |
| 43 | NEW YORK LINTV | 639 | 0 | 0 | $\bigcirc$ | 0 | 0 | 0 | 533 | 0 | 0 | 106 | 0 | 0 |
| 44 | UNIV OF VIRGINIA | 620 | 0 | 0 | 0 | 0 | ? | 0 | 300 | 0 | 8 | 320 | 0 | 0 |
| 45 | michigan state univ | 617 | 0 | 0 | 0 | 0 | 0 | 0 | 277 | 28 | 0 | 312 | 0 | 0 |
| 46 | CASE MESTEHN RESERVE UNIV | 595 | 0 | 0 | 0 | 0 | 0 | ? | 494 | 0 | 0 | 101 | 0 | 0 |
| 47 | UNIV OF CAL SANTA EARGARA | 594 | 0 | 0 | 0 | 0 | 0 | 0 | 69 | 0 | 0 | 534 | 0 |  |
| 48 | U of ala in girminghar | 592 | 0 | 0 | 0 | 0 | 0 | 0 | 515 | 0 | 0 | 77 | 0 | 0 |
| 49 | OHIO STATE UNIV | 574 | 0 | 0 | 0 | 0 | 0 | 0 | $44 ?$ | 29 | 0 | 103 | 0 | 0 |
| 50 | Univ of cricago | 551 | 0 | 0 | 0 | 0 | 0 | 0 | 443 | 0 | 0 | 108 | 0 | 0 |
| 51 | Univ of Scuthean cal | 544 | 0 | 0 | 0 | 0 | 0 | n | 427 | 0 | 0 | 117 | 0 | 0 |
| 52 | UNIV OF MCNTANA | 541 | 0 | 0 | 0 | 0 | 0 | $\stackrel{5}{0}$ | 0 | 0 | 0 | 541 | 0 | 0 |
| 53 | Suny st u auffalo | 533 | 0 | 0 | 0 | 0 | 0 | 0 | 485 | 0 | 0 | 40 | 0 | 0 |
| 54 | YESHIVA UAIV | 514 | 0 | 0 | 0 | 0 | 0 | 0 | 423 | 8 | 0 | 497 | ${ }_{0}$ | 0 |
| 55 | Univ of delamahe | 511 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 497 | 0 | 0 |
| $\begin{array}{r} 56 \\ 58 \end{array}$ | NORTHRESTERN UNIV TEXIS_TEKG URINERSITV | $\begin{aligned} & 503 \\ & 502 \end{aligned}$ | 0 | 0 | 0 | 0 | 0 | 3 | 358 | 0 | 0 | $\begin{aligned} & 145 \\ & 502 \end{aligned}$ | 0 | 0 |


TABLE B-14
CONTINUED
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Table B.15. Federal R\&D obligetions to universities and colleges, by detailed field of science and agency, FY 1971a ${ }^{\text {a }}$

| ience | Total | USDA | AEC | Commerce | DOD | OED | EPA | HEW | Interior | NASA | NSF | DOT | Dther ${ }^{\text {b }}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Total, all fields | 1.544.130 | 74.793 | 95.862 | 6.887 | 241.773 | 16,378 | 17.027 | 695.717 | 21,277 | 128.531 | 216,883 | 7.977 | 21,025 |
| ysical sciences, to | 263.026 | 5.547 | 57.364 | 515 | 64.404 |  | 3.732 | 19.878 | 1.870 | 54.603 | $\overline{55.113}$ |  |  |
| Astronomy | 29.891 |  |  |  | $\begin{array}{r}1.182 \\ 12.833 \\ \hline\end{array}$ |  |  |  |  |  |  |  |  |
| Chemistry | 75.215 155.219 | 5,457 | $\begin{array}{r} 8.711 \\ 48.548 \end{array}$ |  | 12,833 50,389 |  | 3,657 50 | $\begin{array}{r} 19.255 \\ 439 \end{array}$ | $\begin{array}{r} \mathbf{4 3 6} \\ \mathbf{1 . 3 9 9} \end{array}$ | $\begin{array}{r} 5.777 \\ 23.744 \end{array}$ | $\begin{gathered} 19,089 \\ 30.135 \end{gathered}$ |  |  |
| Physics. Physical sc | $\begin{array}{r} 155.219 \\ \quad .701 \\ \hline \end{array}$ |  | $\begin{array}{r} 48.548 \\ 105 \\ \hline \end{array}$ | 515 |  |  |  | $\begin{array}{r} 439 \\ 184 \\ \hline \end{array}$ | $\begin{array}{r} 1.399 \\ \quad 35 \\ \hline \end{array}$ | $\begin{array}{r} 23,744 \\ 2,287 \\ \hline \end{array}$ |  |  |  |
| Mathematics | 41.422 | 558 | 2.931 | ..... | 11.663 |  | 126 | 8.78 | 20 | 777 | 16,562 |  |  |
| Environmental sciences, total | 134,283 | 475 | 4.199 | 4.254 | 40,221 |  | 4.370 | 520 | 8.641 | 26,341 | 43,999 | 66 | 7 |
| Atmospheric | 41.414 37 | 14 461 | 614 <br> 791 <br> 7 | 1.018 302 | 8.372 <br> 14.002 <br>  |  |  |  | 3.550 5.050 | $\begin{array}{r}11.679 \\ 7.386 \\ \hline\end{array}$ | 12.822 <br> 8.613 |  | 1.197 |
| Geological sci Oceanography | 37.892 43.551 | 461 | 791 2.752 | 302 2.872 | 14.002 17.847 |  | -961 |  | 5.050 25 | 7.386 105 | 8.613 <br> 19.389 |  | 1.197 |
|  | 11.426 |  | 2. 42 | ${ }^{2} 62$ |  |  | 374 | 520 | 16 | 7.171 | 3.175 | 66 |  |
| Engineering, total | 160.216 | 3.166 | 5.004 | 11 | 73,577 |  | 1.988 | 10.181 | 5,867 | 31.103 | 24.310 | 3.499 | 1.110 |
| Aero | 9.874 |  | 123 |  | 3.596 |  | 35 |  |  | 5, ${ }^{5.376}$ | 771 |  |  |
| Astronaut Chemical | 16.539 <br> 5.883 | 40 | 61 |  | 1.169 |  | 35 |  | 205 |  | 4.208 |  |  |
| ${ }_{\text {Clivil. }}^{\text {Chem }}$ | 14.881 |  |  |  | 4.573 |  | 587 |  | 2:812 | 172 | 5.627 |  | 1.110 |
| Electric | 52,193 |  | 22 |  | 42.745 |  | 113 | 54 | 88 | 4.422 | 4.749 |  |  |
| Mechanical | 7.496 |  | 140 |  | 2.121 |  | 13 |  |  | 1.595 | 3.623 |  |  |
| Merallurgy \& m | 23.218 |  | 2.198 2.460 | 403 | 13.267 5.983 |  | 13 927 | 10.099 | 2.226 532 | 1,380 | 3.806 1.526 | 3.499 |  |
| Engineering, n.e.c. | 30.132 | 3.126 |  |  |  |  |  |  |  |  |  |  |  |
| Life sciences, tot Biolcgica! | 741.481 423.671 | [ $\begin{aligned} & 52.476 \\ & 52.277\end{aligned}$ | $\begin{array}{\|l\|l} 26.364 \\ 22.664 \end{array}$ | $\begin{aligned} & 683 \\ & 688 \end{aligned}$ | $\begin{aligned} & 25.264 \\ & 18,160 \end{aligned}$ | 335 | 3.839 718 | 566.876 | 2.243 2.167 | $\stackrel{1}{6.955}$ | 46.491 |  | 4.683 |
| Clinical medi | 250.248 | 199 | 3.452 |  | 3.642 | 335 | 633 | 239.969 |  | 1.284 |  |  | 734 |
| Other medical | 62.758 |  | 86 162 | 3 | 1.825 <br> 1.637 |  | $\begin{array}{r} 2.466 \\ 22 \end{array}$ | 57.781 | 76 |  |  |  | 152 |
| Life sciences, n.e.c. | 4.804 |  |  |  |  |  |  | 33.433 | 54 |  |  |  | 1.000 |
| Psychology, $\mathbf{t o t a}$ Biological as | 57.080 22.920 | 10 |  | . | $\begin{array}{r}11.254 \\ 3.088 \\ \hline\end{array}$ |  | 637 | 12.558 |  | 1.094 | 5.543 |  |  |
| Social aspects | 20.876 | 10 |  |  | 7.078 | 1.700 | 13 | 9,348 | 54 | 30 | 1.643 |  | 1.000 |
| Psychological sciences, | 13,284 |  |  |  | 1.088 |  | 100 | 11.527 |  | 372 | 197 |  |  |
| Social scienc | 106.162 | .218 |  | 538 | 8.544 | 14,343 | 179 | 39.972 | 1.297 | 387 | 18.543 |  | 12.141 |
| Anthropol | 3.730 |  |  |  |  |  | 179 | 1.140 <br> 1.133 | 512 |  | 2.519 4.511 |  | 3,910 |
| Economics | 22.968 | 9.889 |  | 529 | 1.104 | 1,201 | 179 |  |  | 17 | 614 |  |  |
| Histor | 422 |  |  |  | 1.730 |  |  | 1.254 |  | 3 | 1.234 |  |  |
| Political science | 2.535 |  |  |  |  |  |  | 162 |  | 319 | 1.167 |  | 87 |
| Sociolog | 21.589 | 325 |  |  | 965 | 7.458 |  | 8.786 | 47 |  | 2.636 |  | 1,372 |
| Social sciences, n.e.c.. | 50.397 |  |  | 9 | 4.745 | 5.684 |  | 27.410 | 727 | 48 | 5.802 |  | 5,972 |
| Dther sciences, n.e.c. | 40.460 | 2.343 | ..... | 486 | 6.846 |  | 2.04 | 16.3 | 1.285 | 2,248 | 4.482 | 4.412 |  |

[^27]STable includes imputations for some $\mathbf{S 2 8}$ million in HEW fellowship and training
obligations. representing grants for which HEW was unable to provide field of science
sincludes only Labor.


8.17. Federal obligations to universities and colleges, by agency and type of control, FY 1971

| Agency | Total |  | Public |  |  | Private |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Amount | Vertical percent distribution | Amount | Vertical percunt distribution | Percent of agency total | Amount | Vertical percent distribution | Percent of agency total |
| Total | 3,480, 150 | 100.00 | 2.105 .588 | 100.00 | 60.50 | 1.374 .562 | 100.00 | 39.50 |
| USDA | 214.597 | 6.17 | 206.819 | 9.82 | 96.38 | 7.778 | . 57 | 3.62 |
| AEC | 105.836 | 3.04 | 56.389 | 2.68 | 53.28 | 49.447 | 3.60 | 46.72 |
| Commerce | 9,673 | . 28 | 7.339 | . 35 | 75.87 | 2.334 | . 17 | 24.13 |
| DOD | 241.773 | 6.95 | 130.154 | 6.18 | 53.83 | 111.619 | 8.12 | 46.17 |
| OEO | 37.521 | 1.08 | 20.840 | . 99 | 55.54 | 16.681 | 1.21 | 44.46 |
| EPA | 27.160 | . 78 | 20.055 | . 95 | 73.84 | 7.105 | . 52 | 26.16 |
| HEW | 2.263,406 | 65.04 | 1.321.702 | 62.77 | 58.39 | 941.704 | 68.51 | 41.61 |
| Interior | 22.617 | . 65 | 19.532 | . 93 | 86.36 | 3.085 | . 22 | 13.64 |
| NASA | 134.054 | 3.85 | 65.555 | 3.11 | 48.90 | 68.499 | 4.98 | 51.10 |
| NSF | 387.737 | 11.14 | 232.421 | 11.04 | 59.94 | 155.316 | 11.30 | 40.06 |
| DOT ${ }^{\text {d }}$ | 10.824 | . 31 | 6.464 | . 31 | 59.72 | 4.360 | . 32 | 40.28 |
| Other ${ }^{\text {a }}$ | 24.952 | . 72 | 18,318 | . 87 | 73.41 | 6.634 | . 48 | 26.59 |

ancludes AID. HUD, and Labor.
SOURCE: National Science Foundation (CASE).
table b-18






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\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|}
\hline \multicolumn{11}{|l|}{\begin{tabular}{l}
TABLE B-18 CONTINUEO \\
TOTAL PEDERAG OOLIGATIONS TO UNIVERSITIES AND COLLEQES AND TME NUMEER OF RECIPIENT INSTITUTIONS, BY GEOGRAPHIC DIVISION, SPAYE, YYPE OF CONYROL, AND TYPE OF ACYIVITY, FY 1971 (DOLLARS IN PMOUSANOS)
\end{tabular}} \\
\hline GEDGRAPMIC DIVISION. STATE, AND TYPE OF CONTROL \& \& popal. all ACPIVITIES \& POPAL academic seifnce \&  \&  \& academic sci FACIL. FOR INSPA. IN
SCI, ENG. \&  \& \[
\begin{aligned}
\& \text { SENERAL } \\
\& \text { SUPORQ FOR } \\
\& \text { SIENCE }
\end{aligned}
\] \& OPHER science \& NONSCIENCE \\
\hline EASP NORTH CENPRAL, POTAL PUBLIC \& \[
\begin{aligned}
\& \text { AM } \\
\& \text { NO. }
\end{aligned}
\] \& 370.513
147 \& 270.924 \& 176.309
45 \& 1,23! \& 2.193 \& 46,937
48 \& 8,594 48 \& 35,880
37 \& 99.589
146 \\
\hline private \& \[
\begin{aligned}
\& \text { AMT } \\
\& \text { NO. }
\end{aligned}
\] \& 159.379
215 \& 1013.326
101 \& 7.724
44 \& 382 \& 643
33 \& 25,450 \& 4.313
55 \& 2,808 30 \& 54,051
213 \\
\hline Chio public \& \[
\begin{aligned}
\& \text { ANP } \\
\& \text { NO, }
\end{aligned}
\] \& 59.165
21 \& 39,034
14 \& 29,243
11 \& 88 \& 383 \& 5,963 \& 1.154
12 \& 12,403 \& 20.131
21 \\
\hline privape \& \[
\begin{aligned}
\& \text { AMP } \\
\& \text { NO. }
\end{aligned}
\] \& 50,852
60 \& 32.097
29 \& 21.1414 \& 15 \& 268
13 \& 9,706
19 \& 10123
17 \& 718
11 \& 17,881 \\
\hline INDIANA PUBLIC \& AMP \& 53,839
10 \& 30,238 \& 24,650 \& 197
2 \& 199 \& 6,692 \& 1,385 \& 5,159 \& 15.601
10 \\
\hline privape \& \[
\begin{aligned}
\& \text { AMY } \\
\& \text { NO. }
\end{aligned}
\] \& 10,934
33 \& 6.697
14 \& 3,750
3 \& 145 \& 10 \& 757 \& 1.280 \& 825 \& 4.237 32 \\
\hline ILIINOIS public \& \[
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\& A M P \\
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\] \& 71.330 47 \& 52,935
19 \& 37,429 \& 442 \& 275 \& 9,784
90 \& \[
\begin{aligned}
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\] \& 6.023 \& 18.395 \\
\hline privape \& \[
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\& \text { AMY } \\
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\] \& 62,752
60 \& 60,692
30 \& 43,725
12 \& 222 \& 255
11 \& 13.976
17 \& 1.644
18 \& 870 \& 22.060 60 \\
\hline michigan public \& \[
\begin{aligned}
\& \text { AHY } \\
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\] \& 124,849
42 \& 84,384 \& 56,860
8 \& 388 \& 733
88 \& 16.254
11 \& 21499 \& 7.652 \& 30.465
42 \\
\hline private \& AMP
NO. \& 6,399 37 \& 10207
15 \& 683 \& \(!\) \& 58
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\hline WISCONSIN public \& \[
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\] \& 71.330
29 \& 56,333
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12 \& 136 \& 603 \& 10.264 \& 2,596 \& 4,647 \& 14.997
26 \\
\hline privape \& AMP \& 6.442
25 \& 3.699
13 \& 2.425 \& \[
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\] \& \[
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\] \& 234
2 \& 135 \& 4,743
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\] \& 234.336
293 \& 132,055
61 \& 72.499
34 \& 4,614 \& 929
33 \& 24.651
42 \& 6,806
39 \& \[
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22,558 \\
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\end{array}
\] \& 102,481
123 \\
\hline privape \& Sins \& 06. 644 \& 36,605
58 \& 23,413
18 \& 1.075
2 \& 200
16 \& 0.606
41 \& 2,097
32 \& 1.214
23 \& \[
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44,039 \\
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\hline minnesota public \& AMS \& 3.117
25 \& 44,931 11 \& 26,743 \& 21983 \& 203 \& 9.240 \& 11045 \& 4.719 \& \[
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\] \& 4,981

25 \& 1.430
16 \& 205
3 \& 0 \& 61 \& 406
12 \& 309 \& 451 \& 3.551
25 <br>

\hline lowa public \& $$
\begin{aligned}
& \text { AMY } \\
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$$ \& 45,384

16 \& 28,217 \& 15,743 \& 462
1 \& 147 \& 4.793 \& 21922

3 \& 4,350 \& $$
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17.167 \\
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\end{array}
$$ <br>

\hline private \& AMY \& 7,888
33 \& 1.073 17 \& 47 \& 0 \& 37 \& 238 \& 329 \& 402 \& 6.815 3 <br>
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| Rank | INSTITUTION PRANKED BY TOTAL FEDERAL obligarions) |
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|  | arizona state univ san diego state col north daxcta state univ untv of delanare |

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DRRTMOUTH CCL
EMORY UNIV 33 UNIV OH CINCINAATI
35 CARNEGIE NELLON UNIV
36 GALLAULET CRL
37 CREIGHTON URIV
38 BROWN UNIV
39 KOCKEFELLER UNIV 39 ROCKEFELLER UNIV
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SOURCE: NATIOAAL SCIENCE FOUVDATION (CASE)




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[^0]:    For sole by the Superintendent of Documents, U S. Government Printing Office, Woshington, DC. 20402

[^1]:    Department of Agriculture (USDA)
    Atonic Energy Commission (AEC)
    Department of Commerce (Commerce)
    Department of Defense (DOD)
    Department of Health, Education, and Welfare (HEW)
    Department of Housing and Urban Development (HUD)

[^2]:    'A list of the 2.1 systems recenvin notes, appendix $A$, $p .41$. Dollar amo
    : Sec technical notes, pare $\{3$, for 1

[^3]:    'A list of the 2.4 systems receiving oblyations in fiscal year 1971 can be found in the technical rotes, appendix A, p. 41. Dollar amounts are shown in appendix tables B-22, B-23, and B-24.
    ${ }^{2}$ See technical notes, page 43, for further details.

[^4]:    'The State distribution of R\&D funding, howerer. does not show close correlation with the geo graphic distribution of Ph . D. degrees awarded in the stiences and engineering.
    

[^5]:    - Academic year

[^6]:    "Brathelor"s degrecs or higher.

[^7]:    - Academic year

    SOURCE National Science Foundation (CASE), Office of Education

[^8]:    ${ }^{3}$ Some dafting occuried between 1970 and 1971 in the chassifation of program funds amons fields of serence, espechally runds reported in 1970 under "other sciences, n.e.s." furthermore, the 1970.71 fie d of scrence dostrbutrons include estimates involing $\$ 1$ percent of DOD's 1970 R\&D total and 9 percent of HEW's $1971 \mathrm{R} \mathrm{\& D}$ amount. For these reasons, precise measurement of change, in funding levels beineen the ? years is not possible.

[^9]:    - Academic year

[^10]:    *Academic year
    SOURCE: National Science Foundation (CASE); Office of Education.

[^11]:    SOURCE: National Science Foundation (CASE)

[^12]:    ${ }^{*}$ Established in FY 1971.
    SOURCE: National Science Foundation (CASE).

[^13]:    SOURCE: National Science Foundation (CASE).

[^14]:    SOURCE: National Science Foundation (CASE).

[^15]:    SOURCE: Natıonal Science Foundation (CASE)

[^16]:    ${ }^{4}$ Bexmming with fY 1972 , AEC will report sepatate data tor the Latermore and Burhelet 1,sboratories, the two tomponents of Lawrence Laboratomes.

[^17]:    SOURCE: National Science Foundation (CASEI.

[^18]:    'See technical notes, page 42, for information on the definttoons ind concepts used in this part of the report
    : Yearly fluctuations in ageney support levels reflect primariIv atual changes in the amount of funds to miderdual institutes and, secondly, thanges in the unverse of research mstitutions meeting the criteria for melusion th the survey.

[^19]:    ${ }^{1}$ Data for the Atomic Energy Commission were provided in terms of costs rather than obligations but are treated as substantially the same thing in this inalysis.

[^20]:    ${ }^{2}$ National Sc ence Foundation, Federal Fünds fos Research, Development, and Other Scientific Activities, Fiscal Years 1971, 1972, and 1973, Vol. XXI (NSF 72.317) Washington, D.C. 20402: Supt. of Documents, U.S. Government Printing Office, 1973.)

[^21]:    ${ }^{3}$ Not else where classified. This category includes multidisciplinary projects within the broad field and single discipline projects for which a separate field has not been assigned.

[^22]:    ${ }^{3}$ Not elsewhere classified. This category includes multidisciplinary progects within the broad field and single discipline projects for which a separate field has not been assigned.

[^23]:    a includes AID．HUD，and Labor
    NOTE：NA－Not available．
    SOURCE：National Science Foundation（CASE）．

[^24]:    a Includes AID，HUD，and Labor．
    SOURCE：National Science Foundation（CASE）．

[^25]:    SOURCE：National Science Foundation（CASE）．

[^26]:    Includes some R\&D plant funding which could not be reported separately.
    SOURCE: National Science Fuundation (CASE).

[^27]:    a Table includes imputations for some 562 million in HEW R\&D obligations, representing
    grants and contracts for which HEW was unable to provide field of science breaks.
    Includes AID. HUO, and Labor.
    SDURCE: National Science Foundation (CASE).

[^28]:    IINCLUDES AID, HUL LABOR
    SOURCE: NATIOAAL SCIENCE FCUNDATION (CASE)

[^29]:    DCN BOSCO COL
    DHEW UNIV
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    MCNMOUTH COL
    MCNYCAIR STATE COL
    NJ COL OF UEDEDENTISTRY
    NEWARK CDL OF ENGINEERIMG
    
    
    PFINCEYON UNIV OF N J
    RAMAPO COLLEGE GF
    RICHARD STOCKTON ST COLL
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    TCMEROCK COL
    THENTON STATE CML
    UAION COL
    UAION COUNTY TECK INST
    UPSALA COL
    WALSH COLLESE
    HESTHINSTER CHOIR CNL
    WILLIAM PAPERSOR COLLEGT:
    NEW MEXICO, TOTAL
    CCL OF ARTESIA
    CCL OF SANY: FE
    EASTERN NEW MEXICO UNIV
    NEW MEX INST MINNG SEC
    NEW MEXICO YIGHLANDS UNIV
    NEW MEXICO JR COL
    NEN MEXICO MILITARYINST
    NEN MEXICO STATE UNIV
    UNIV OF ALEUOUERUE
    UNIY OF NEN MEXICO
    WESTERN NEN MEXICO UNIV

