FY 2010
ANNUAL R&D EXPENDITURES REPORT

Office of Institutional Research
UMASS President's Office
July 2011

The University *of* Massachusetts

Amherst • Boston • Dartmouth • Lowell • Worcester • UMassOnline

PREFACE

The FY 2010 Annual Research and Development Expenditures Report presents information on the research and development expenditures for the University of Massachusetts System.

IMPORTANT NOTE ON CHANGES FROM FY2009 SURVEY

The *Higher Education Research and Development Survey* for FY 2010, formerly the *Survey of Research and Development Expenditures at Universities and Colleges*, has undergone significant redesign from its previous version. NSF outlines these changes as follows:

1. **FY 2010 HERD now includes ALL fields of R&D in all survey questions**

All fields of R&D are now included in an institution's Total R&D expenditures, - BOTH Science and Engineering (S&E) fields and Non-Science and Engineering (Non-S&E) fields, such as humanities, education, law, and the arts.

2. **Other General Changes**

- Two alternative listings show the discipline examples for each R&D field:
  1) Alphabetical listing of disciplines by field (see Question 9).
  2) U.S. Department of Education's CIP code listing by field (see the Main Menu on the survey website).
- **Clinical trials and research training grants are now explicitly included in the definition of R&D.**
- Each institution campus headed by a campus level president or chancellor is asked to complete a separate survey rather than combine their response with other campuses in their university system.

3. **Changes to Questions**

- Sources of funds: Separate categories have been created for nonprofit organizations and for institutional cost sharing. The "Industry" category has been renamed "Business" (Question 1).
- Expenditures by field and source: Information is requested by field of R&D for all sources of funds.
  - Question 9 asks for federally funded expenditures by agency and field.
  - Question 12 asks for non-federally funded expenditures by field for each nonfederal source.

4. **New Questions**

For these new questions: If you do not have data available for one or more of the cells, please leave them blank instead of entering zero(s).

- Question 2. Foreign funding for R&D
- Question 3. Contracts and grants
- Question 4. R&D at medical schools
- Question 5. Clinical trial R&D
- Question 6. Basic research, applied research, and development
- Question 10. Other federal agency sources
- Question 11. R&D funded by the American Recovery and Reinvestment Act (ARRA)
- Question 13. Cost elements of R&D
- Question 14. Capitalization thresholds
- Question 16. Headcount of R&D personnel
- Question 17. Headcount of R&D postdocs

Source: National Science Foundation Higher Education Research And Development Survey. FY 2010

Definitions and Criteria For 'R&D Expenditures' - According to the National Science Foundation Survey of Research And Development Expenditures,*"(Separately budgeted) R&D Expenditures* include all funds expended for activities that are specifically organized to produce research outcomes. These activities are either commissioned by an agency external to the institution or are separately budgeted by an organizational unit within the institution. *Expenditures* are funds actually spent by an institution during its fiscal year. *Separately budgeted R&D equipment purchased from current funds* includes all research equipment purchased under sponsored research project awards." www.nsf.org.

a. ***Federal Government.*** This includes awards for R&D (including direct and reimbursed indirect costs) by all agencies of the Federal Government.

b. ***State and Local Governments.*** This includes funds for R&D (including direct and reimbursed indirect costs) from State, county, municipal, or other local governments and their agencies. Include here State funds that support R&D at agricultural and other experiment stations.

c. ***Business*****.** This category was previously called "Industry." It includes all awards for R&D (including direct and reimbursed indirect costs) from profit-making organizations, whether engaged in production, distribution, research, service, or other activities.

d. Non-Profit Organizations . This category has been introduced as a separate entity in the FY 2010 HERD survey. It includes funds from Domestic or foreign nonprofit foundations and organizations.

e. ***Institution Funds.*** This represents funds, *including* related indirect costs, that your institution spent for R&D activities from the following unrestricted sources: general-purpose State or local government appropriations; general-purpose awards from industry, foundations, or other outside sources; tuition and fees; endowment income; gifts; and other institutional funds. In addition, estimate your institution's on-campus and off-campus unreimbursed indirect costs associated with externally funded R&D projects, including mandatory and voluntary cost sharing. To estimate unreimbursed indirect costs, preferably on a project-by-project basis, use your appropriate on-campus or off-campus ***negotiated research indirect cost rate(s)*** multiplied by the corresponding base(s) minus actual indirect cost recovery.

e. ***All Other Sources.*** Include awards for R&D (including direct and reimbursed indirect costs) from nonprofit foundations and voluntary health agencies as well as from all other sources not

elsewhere classified. Also include gifts from individuals that are restricted by the donor to research. Funds from foundations that are affiliated with, or granted solely to your institution, should be included under "Institution funds." Funds for R&D received from a health agency that is a unit of a State or local government should be included under "State and local governments."

Additional highlights as well as rankings and comparative data can be found in the expanded version of this report (to be released shortly). Please contact us at the University of Massachusetts President's Office, Office of Institutional Research, if you would like to obtain a hard copy.

Please Note: Following the implementation system-wide of ERP research administration software in 2007, significant improvements have been made to the methodology used to gather, analyze, and report the FY2010 R&D Expenditures data. Although variations at the aggregate level are not overly significant, there might be a slight impact of possible methodological inconsistencies for trended data at the sub-category levels. Comparison to data from prior years should be made with this awareness, as campuses are currently in the process of reviewing their methodology.

Barbara Velardi
Research Associate

Neena Verma
Director of Institutional Research

CONTENTS

TOTAL R&D EXPENDITURES – UMASS SYSTEM AND CAMPUSES

LIFE SCIENCES R&D EXPENDITURES

Introduction

The *FY2010 Annual Research and Development Expenditures* Report presents information on the research and development expenditures for the University of Massachusetts System. It is based on data that our five campuses provide to the National Science Foundation (NSF) through its annual Survey of Research and Development Expenditures at Universities and Colleges (now known as HERD or the *Higher Education Research and Development* Survey). In addition to the FY2010 data, this report also provides trend data in many cases. This report is based on data that our five campuses provide to the National Science Foundation (NSF) through its Higher Education Research and Development Survey (previously known annual Survey of Research and Development Expenditures at Universities and Colleges).

The report is comprised of two sections: Total R&D Expenditures (pages 1-15) and Life Sciences R&D Expenditures (pages 16-18). In addition to the FY2010 data, this report also provides trend data in many cases.

Major Highlights:

- **UMass Total R&D Expenditures** - Total FY2010 R&D expenditures for the University of Massachusetts System was reported at $542.7 Million, which represents an 11% increase from the FY2009 total of $489.1 Million.

- **Growth in Total R&D Expenditures (UMass versus All U.S. Institutions) –** Total R&D expenditures for the University of Massachusetts System has grown at a higher rate than the national trend for all U.S. institutions. In FY2009 (most recent comparison data available), while the UMass system reflected an annual growth rate of 12.4% over the previous year, All U.S. Institutions reflected a growth rate of 5.9%.

- **UMass R&D Expenditures in Science and Engineering** – In FY2010, an estimated $515.7 million (95%) of our R&D expenditures are in the sciences and engineering (S&E).

- **UMass State Ranking in Science and Engineering R&D Expenditures -** Among Massachusetts colleges and universities, UMass ranked 2nd in S&E expenditures, behind only MIT. In 2009, UMass comprised nearly one-fifths (19%) of the total S&E R&D Expenditures of all MA institutions. UMass, MIT, Harvard and BU together account for 79% of the academic science and engineering R&D expenditures in the state. (Rankings based on FY 2009 data).

- **UMass R&D Expenditures by Funding Source (FY2010)** - In terms of funding sources, 61% is from the federal government, 25% is from institutional sources, 2% is from state and local government, 5% from businesses, 6% from non-profit organizations, and 1% is from other sources (e.g., private foundations).

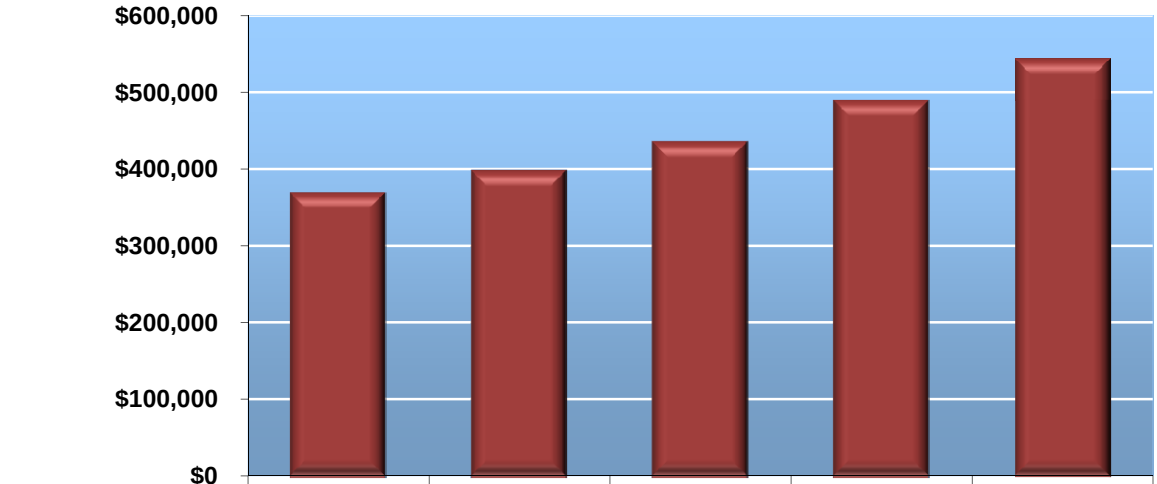
- **UMass Areas of Funding Growth** – Between the reporting cycles FY2009-10, industry/business sponsorship increased by 5 percentage points (from 6% to 11%), institutional funding stayed the same at 25%, state and local government funding dropped by one percentage point (from 3% to 2%), and federal funding increased by 3 percentage points (from 58% to 61%) from the prior year.

- **Life Sciences Continues to Comprise More Than Half of all R&D Expenditures at UMass** - At $300.6 Million, life sciences constitute more than half of UMass's total R&D expenditures (55.4%). FY2010 distribution of R&D expenditures by field is:

Life Sciences	55.4%	Social Sciences	3.9%
Physical Sciences	9.2%	Non Sciences/Engineering	5.0%
Engineering	13.6%	Psychology	2.6%
Computer Sciences	4.5%	Mathematical Sciences	0.7%
Environmental Sciences	4.5%	Other Sciences	0.7%

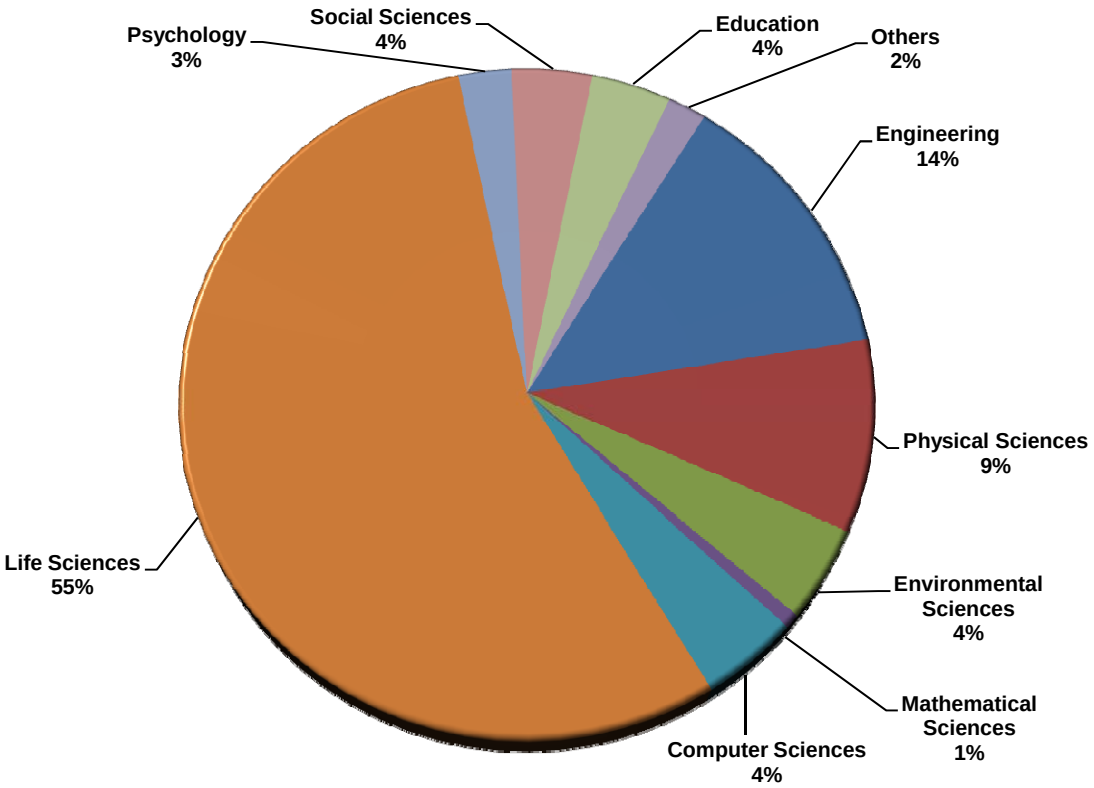
UMASS System

Total R&D Expenditures FY2006 – FY2010



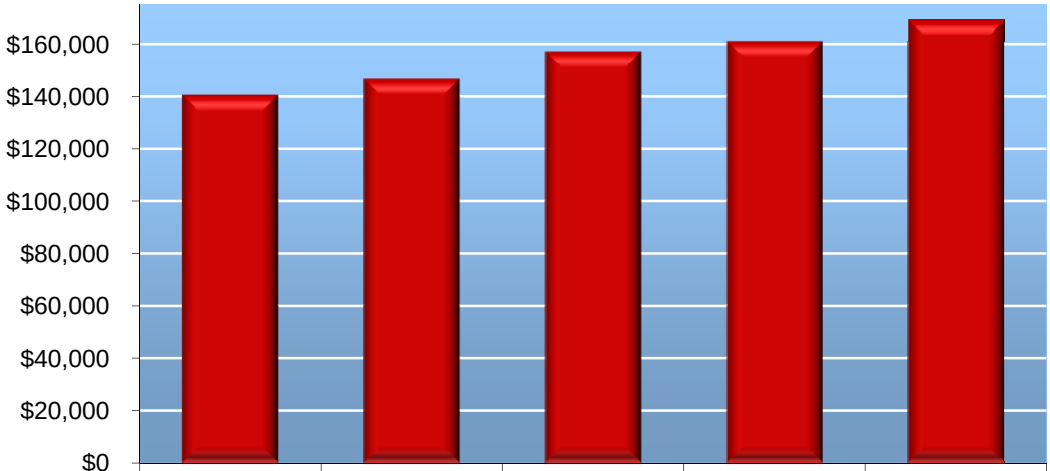
	FY2006	FY2007	FY2008	FY2009	FY2010
Total R&D ($000s)	$368,755	$397,470	$435,247	$489,060	$542,668
Annual Growth	5.5%	7.8%	9.5%	12.4%	11.0%

Total R&D Expenditures FY2010



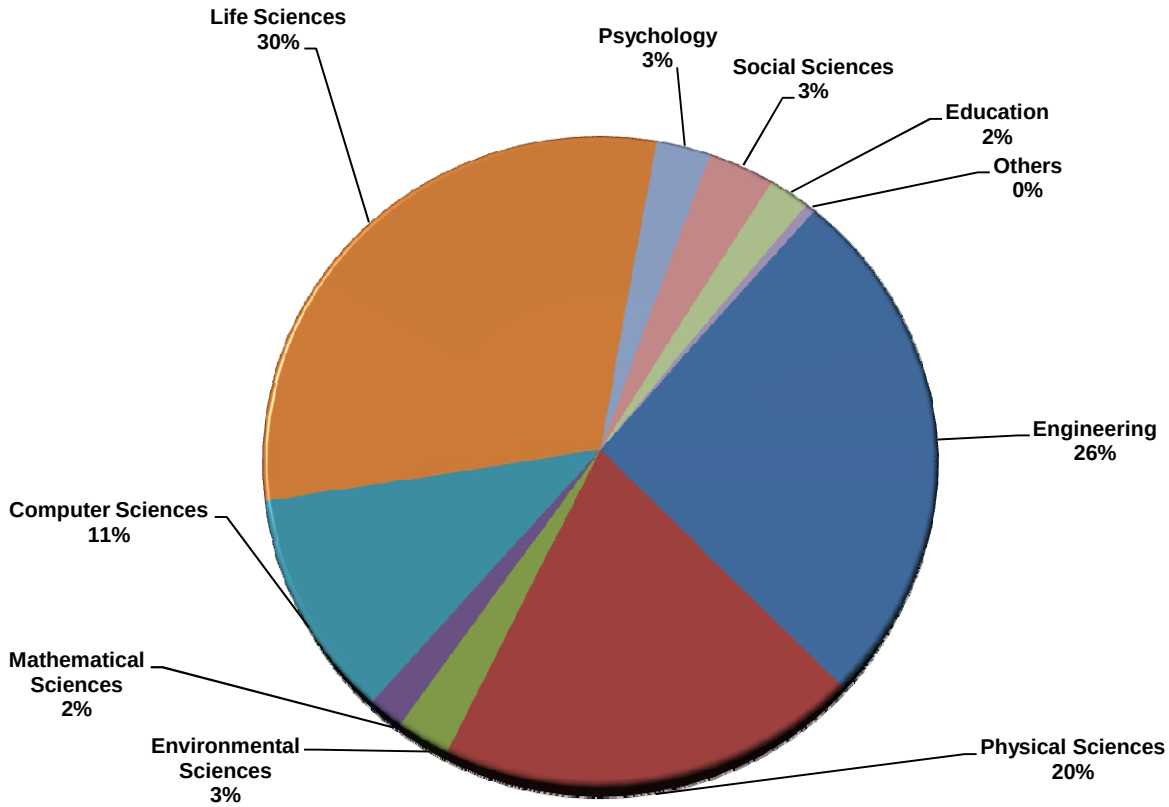
Amherst

Total R&D Expenditures FY2006 – FY2010



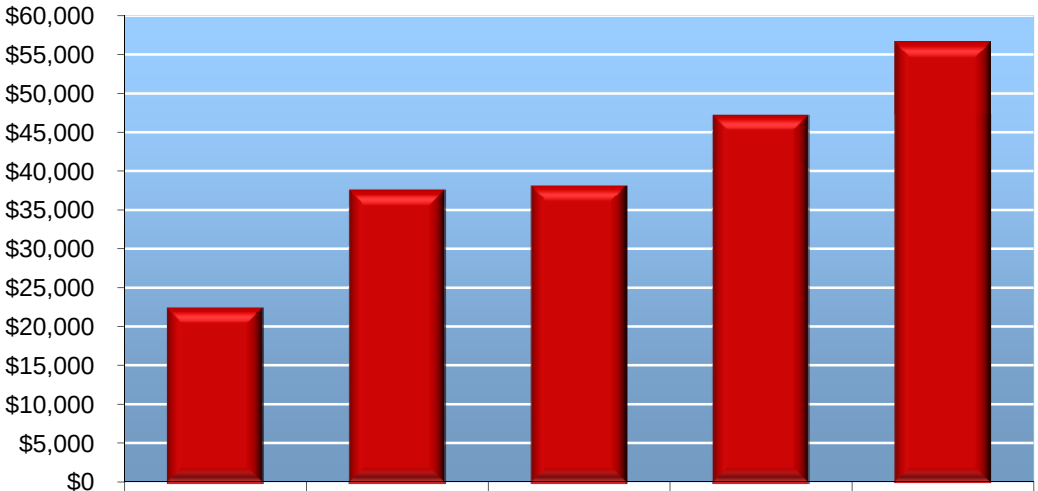
	FY2006	FY2007	FY2008	FY2009	FY2010
Total R&D ($000s)	$140,184	$146,323	$156,817	$160,666	$169,143
Annual Growth	4.5%	4.4%	7.2%	2.5%	5.3%

Total R&D Expenditures FY2010



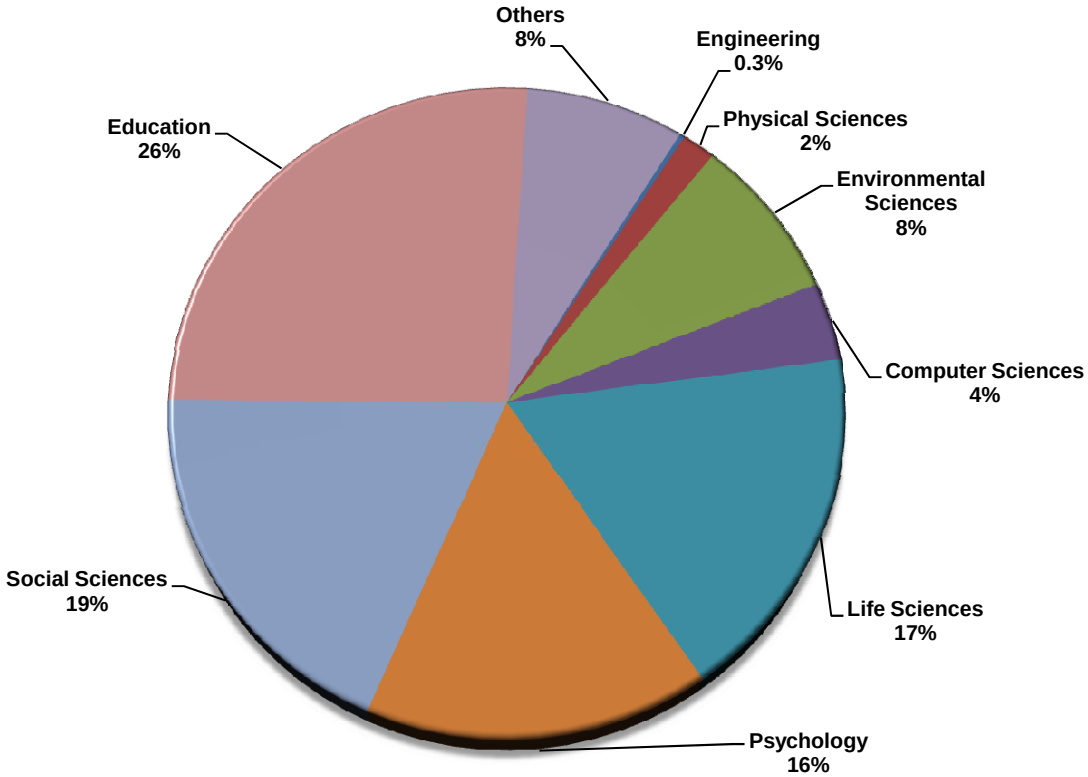
Boston

Total R&D Expenditures FY2006 – FY2010



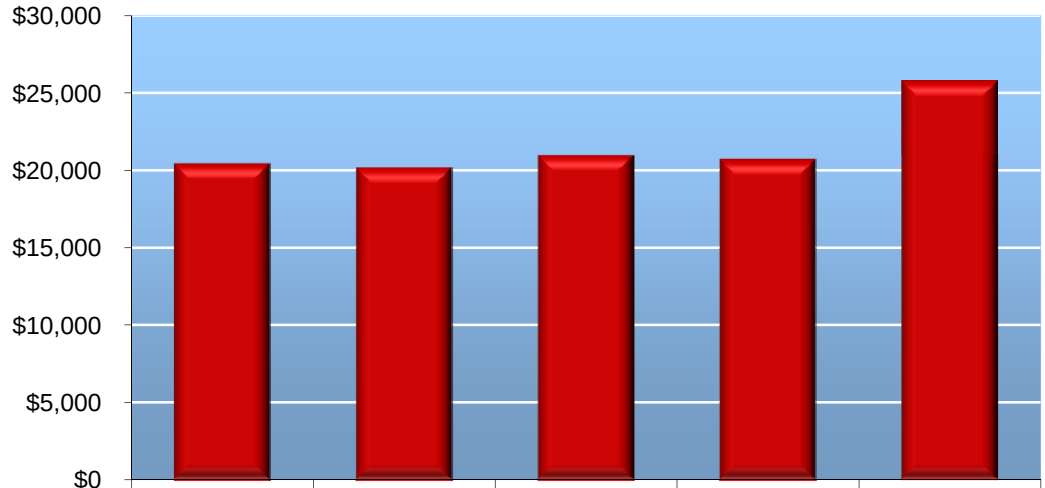
	FY2006	FY2007	FY2008	FY2009	FY2010
Total R&D ($000s)	$22,347	$37,441	$38,018	$47,028	$56,416
Annual Growth	15.1%	67.5%	1.5%	23.7%	20.0%

Total R&D Expenditures FY2010



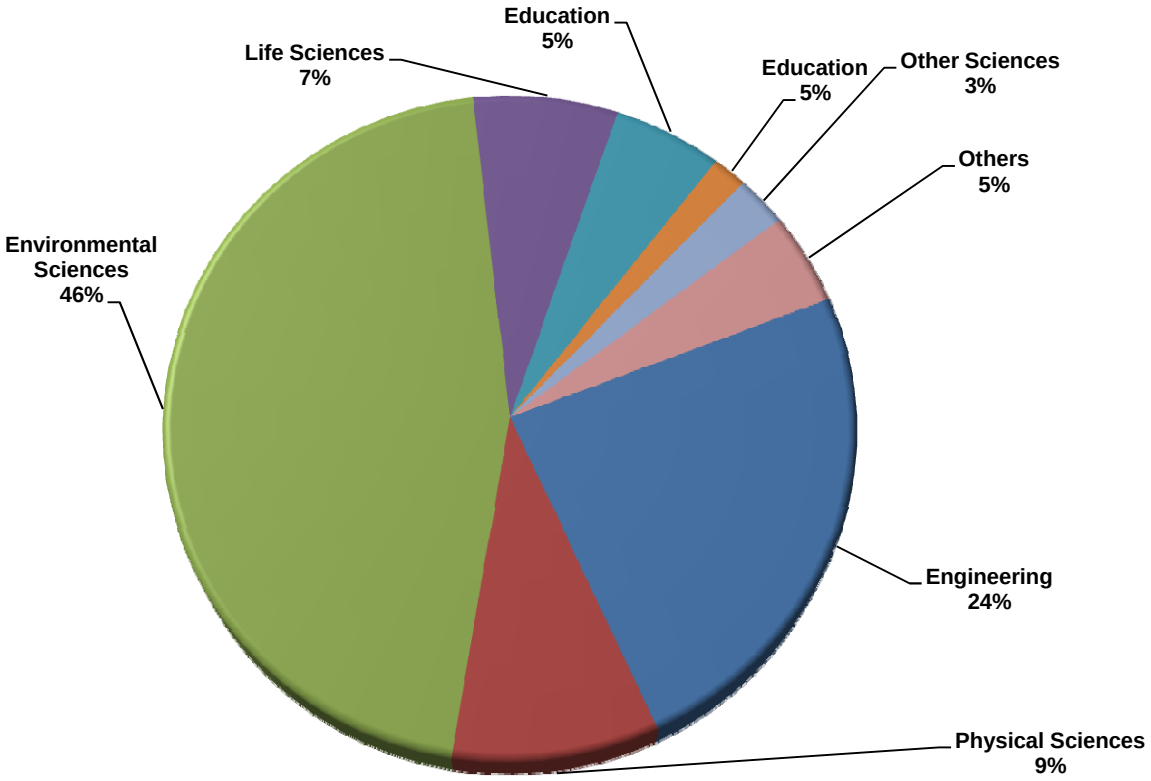
Dartmouth

Total R&D Expenditures FY2006 – FY2010



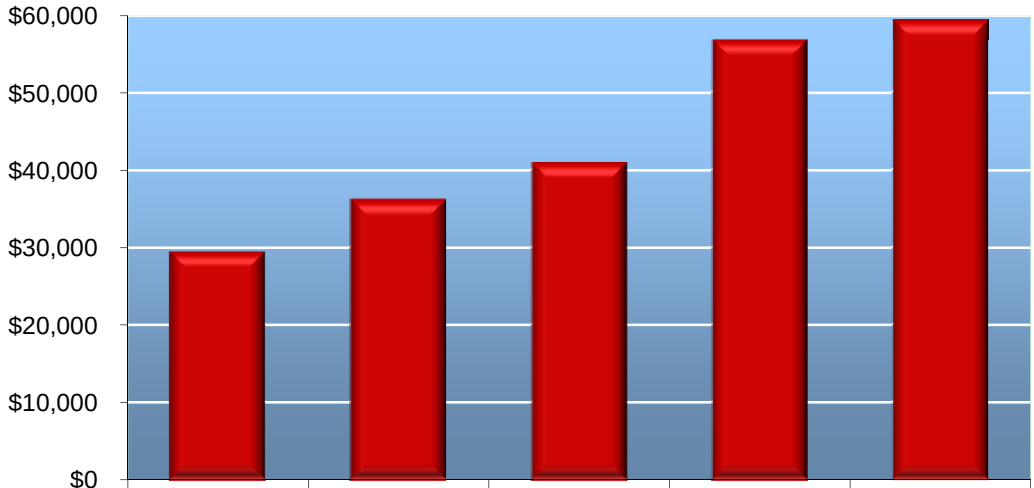
	FY2006	FY2007	FY2008	FY2009	FY2010
Total R&D ($000s)	$20,389	$20,120	$20,925	$20,669	$25,725
Annual Growth	-3.5%	-1.3%	4.0%	-1.2%	24.5%

Total R&D Expenditures FY2010



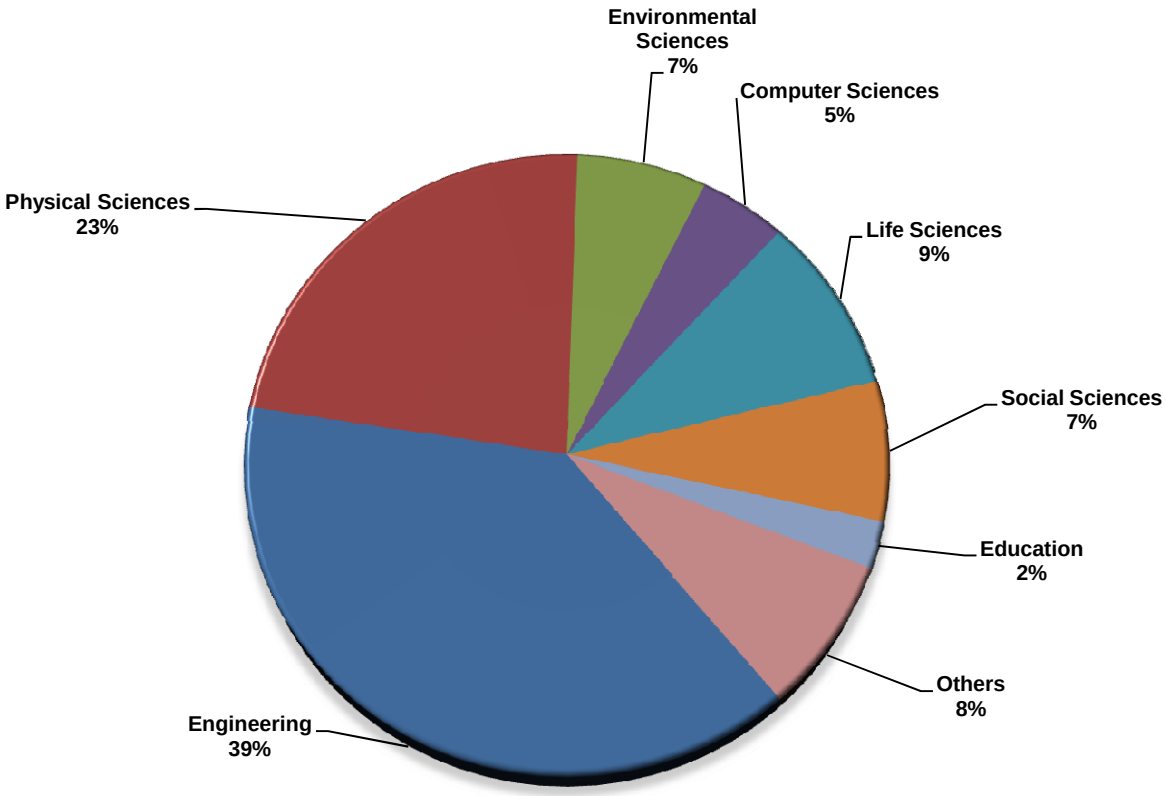
Lowell

Total R&D Expenditures FY2006 – FY2010



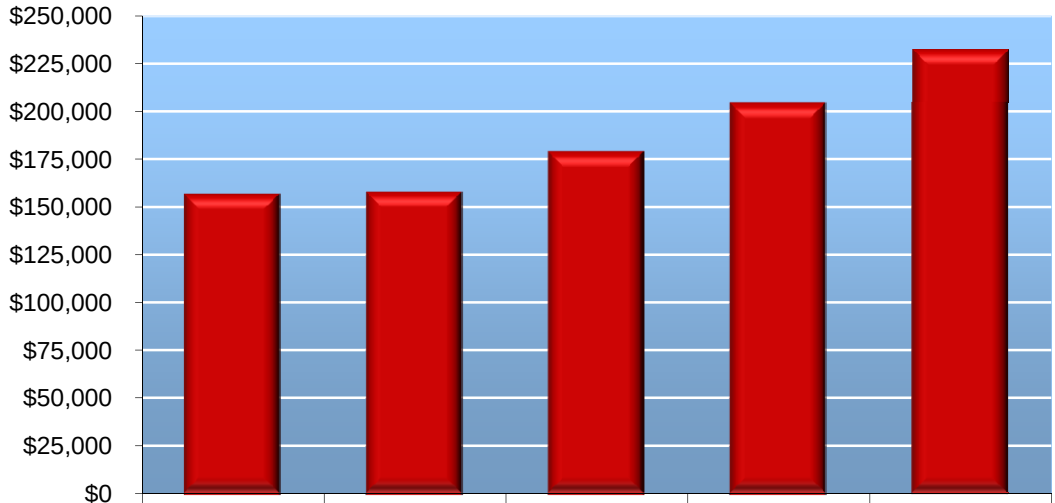
	FY2006	FY2007	FY2008	FY2009	FY2010
Total R&D ($000s)	$29,383	$36,117	$40,873	$56,664	$59,345
Annual Growth	14.1%	22.9%	13.2%	38.6%	4.7%

Total R&D Expenditures FY2010



Worcester

Total R&D Expenditures FY2006 – FY2010



	FY2006	FY2007	FY2008	FY2009	FY2010
Total R&D ($000s)	$156,452	$157,469	$178,614	$204,033	$232,039
Annual Growth	4.8%	0.7%	13.4%	14.2%	13.7%

All of Worcester's R&D expenditures are in the Life Sciences.

Total R&D Expenditures By Field FY2010

FIELD	UMA FY2010	% of UMA Total	% of Field	UMB FY2010	% of UMB Total	% of Field	UMD FY2010	% of UMD Total	% of Field	UML FY2010	% of UML Total	% of Field	UMW FY2010	% of UMW Total	% of Field	System FY2010	% of Total
Engineering (Total)	**$ 44,357**	**26.2%**	**60.3%**	**$ 141**	**0.2%**	**0.2%**	**$ 6,175**	**24.0%**	**8.4%**	**$ 22,874**	**38.5%**	**31.1%**	**$ -**			**$ 73,547**	**13.6%**
Aeronautical & Astronomical	$ -			$ -			$ -	0.0%		$ -			$ -			$ -	0.0%
Bioengineering/Biomedical	$ -			$ -			$ 165	0.6%	34.4%	$ 314			$ -			$ 479	0.1%
Chemical	$ 15,383	9.1%	93.3%	$ -			$ -			$ 1,112	1.9%	6.7%	$ -			$ 16,495	3.0%
Civil	$ 7,517	4.4%	80.2%	$ -			$ 759	3.0%	8.1%	$ 1,096	1.8%	11.7%	$ -			$ 9,372	1.7%
Electrical	$ 15,088	8.9%	69.5%	$ 139	0.2%	0.6%	$ 1,769	6.9%	8.1%	$ 4,710	7.9%	21.7%	$ -			$ 21,706	4.0%
Mechanical	$ 5,756	3.4%	55.1%	$ -			$ 841	3.3%	8.1%	$ 3,840	6.5%	36.8%	$ -			$ 10,437	1.9%
Metallurgical & Materials	$ -		0.0%	$ -			$ 753	2.9%	18.0%	$ 3,439	5.8%	82.0%	$ -			$ 4,192	0.8%
Other	$ 613	0.4%	5.6%	$ 2	0.00%	0.0%	$ 1,888	7.3%	17.4%	$ 8,363	14.1%	77.0%	$ -			$ 10,866	2.0%
Physical Sciences (Total)	**$ 33,074**	**19.6%**	**65.9%**	**$ 932**	**1.7%**	**1.9%**	**$ 2,421**	**9.4%**	**4.8%**	**$ 13,731**	**23.1%**	**27.4%**	**$ -**			**$ 50,158**	**9.2%**
Astronomy	$ 4,135	2.4%	100.0%	$ -			$ -			$ -			$ -			$ 4,135	0.8%
Chemistry	$ 21,591	12.8%	79.3%	$ 688	1.2%	2.5%	$ 1,768	6.9%	6.5%	$ 3,188	5.4%	11.7%	$ -			$ 27,235	5.0%
Physics	$ 7,348	4.3%	39.1%	$ 244	0.4%	1.3%	$ 653	2.5%	3.5%	$ 10,543	17.8%	56.1%	$ -			$ 18,788	3.5%
Other	$ -			$ -			$ -			$ -			$ -			$ -	0.0%
Environmental Sciences (Total)	**$ 4,252**	**2.5%**	**17.3%**	**$ 4,634**	**8.2%**	**18.8%**	**$ 11,751**	**45.7%**	**47.7%**	**$ 4,002**	**6.7%**	**16.2%**	**$ -**			**$ 24,639**	**4.5%**
Atmospheric	$ -			$ -			$ -			$ -			$ -			$ -	
Earth Sciences	$ 3,203	1.9%	44.0%	$ 69	0.1%	0.9%	$ -			$ 4,002	6.7%	55.0%	$ -			$ 7,274	1.3%
Oceanography	$ -	0.0%	0.0%	$ 4,030	7.1%	25.5%	$ 11,751	45.7%	74.5%	$ -			$ -			$ 15,781	2.9%
Other	$ 1,049			$ 535	0.9%	33.8%	$ -			$ -			$ -			$ 1,584	0.3%
Mathematical Sciences (Total)	**$ 2,817**	**1.7%**	**76.4%**	**$ 19**	**0.0%**	**0.5%**	**$ 372**	**1.4%**	**10.1%**	**$ 481**	**0.8%**	**13.0%**	**$ -**			**$ 3,689**	**0.7%**
Computer Sciences (Total)	**$ 18,841**	**11.1%**	**78.0%**	**$ 2,188**	**3.9%**	**9.1%**	**$ 428**	**1.7%**	**1.8%**	**$ 2,696**	**4.5%**	**11.2%**	**$ -**			**$ 24,153**	**4.5%**
Life Sciences (Total)	**$ 51,328**	**30.3%**	**17.1%**	**$ 9,916**	**17.6%**	**3.3%**	**$ 1,798**	**7.0%**	**0.6%**	**$ 5,521**	**9.3%**	**1.8%**	**$ 232,039**	**100.0%**	**77.2%**	**$ 300,602**	**55.4%**
Agricultural	$ 21,710	12.8%	97.1%	$ -			$ 645	2.5%	2.9%	$ -			$ -			$ 22,355	4.1%
Biological	$ 22,495	13.3%	21.4%	$ 2,537	4.5%	2.4%	$ 1,120	4.4%	1.1%	$ 1,281	2.2%	1.2%	$ 77,718	33.5%	73.9%	$ 105,151	19.4%
Medical	$ 6,410	3.8%	4.7%	$ 4,697	8.3%		**$ -**			$ -			$ 124,323	53.6%	91.8%	$ 135,430	25.0%
Other	$ 713	0.4%	1.9%	$ 2,682	4.8%	7.1%	$ 33	0.1%	0.1%	$ 4,240	7.1%	11.26%	$ 29,998	12.9%	79.6%	$ 37,666	6.9%
Psychology (Total)	**$ 4,560**	**2.7%**	**32.7%**	**$ 9,031**	**16.0%**	**64.8%**	**$ 198**	**0.8%**	**1.4%**	**$ 137**	**0.2%**	**1.0%**	**$ -**			**$ 13,926**	**2.6%**
Social Sciences (Total)	**$ 5,625**	**3.3%**	**26.8%**	**$ 10,524**	**18.7%**	**50.1%**	**$ 530**	**2.1%**	**2.5%**	**$ 4,334**	**7.3%**	**20.6%**	**$ -**			**$ 21,013**	**3.9%**
Economics	$ 2,478	1.5%	66.3%	$ 797	1.4%	21.3%	$ 12	0.0%	0.3%	$ 453	0.8%	12.1%	$ -			$ 3,740	0.7%
Political Science	$ 1,394	0.8%	23.2%	$ 3,056	5.4%	50.8%	$ 231	0.9%	3.8%	$ 1,331	2.2%	22.1%	$ -			$ 6,012	1.1%
Sociology	$ 1,086	0.6%	52.5%	$ 858	1.5%	41.4%	$ 37	0.1%	1.8%	$ 89	0.1%	4.3%	$ -			$ 2,070	0.4%
Other	$ 667	0.4%	7.3%	$ 5,813	10.3%	63.2%	$ 250	1.0%	2.7%	$ 2,461	4.1%	26.8%	$ -			$ 9,191	1.7%
Other Sciences (Total)	**$ -**			**$ 2,002**	**3.5%**	**50.2%**	**$ 639**	**2.5%**	**16.0%**	**$ 1,344**	**2.3%**	**33.7%**	**$ -**			**$ 3,985**	**0.7%**
TOTAL, SCI & ENG FIELDS	**$ 164,854**	**97.5%**	**32.0%**	**$ 39,387**	**69.8%**	**7.6%**	**$ 24,312**	**94.5%**	**4.7%**	**$ 55,120**	**92.9%**	**10.7%**	**$ 232,039**	**100.0%**	**45.0%**	**$ 515,712**	**95.0%**

Total R&D Expenditures By Field FY2010

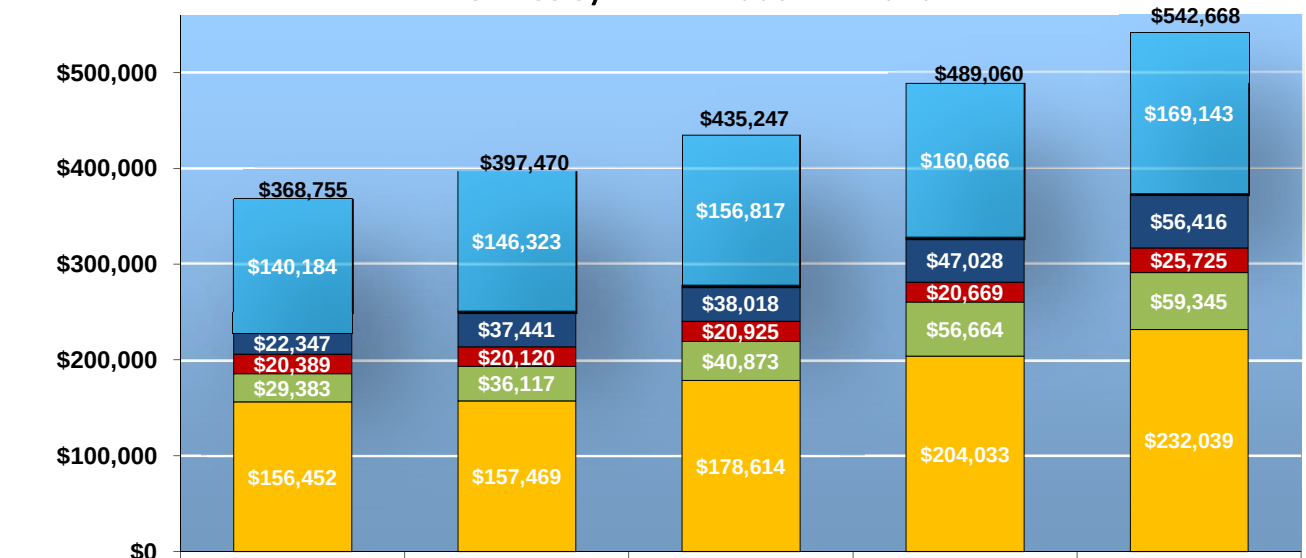
FIELD	UMA	% of UMA Total	% of Field	UMB	% of UMB Total	% of Field	UMD FY2009	% of UMD Total	% of Field	UML	% of UML Total	% of Field	UMW FY2009	% of UMW Total	% of Field	System FY2009	% of Total
Education	$ 3,460	2.0%	16.6%	$ 14,607	25.9%	69.9%	$ 1,356	5.3%	6.5%	$ 1,460	2.5%	7.0%	$ -			$ 20,883	3.8%
Law	$ 130	0.1%	100.0%	$ -	0.0%	0.0%	$ -			$ -	0.0%	0.0%	$ -			$ 130	0.0%
Humanities	$ 241	0.1%	43.3%	$ 303	0.5%	54.5%	$ 12	0.0%	2.2%	$ -			$ -			$ 556	0.1%
Visual and Performing Arts	$ 24	0.0%	20.5%	$ 19	0.0%	16.2%	$ 31	0.1%	26.5%	$ 43	0.07%	36.8%	$ -			$ 117	0.02%
Business and Management	$ 336	0.2%	10.1%	$ 2,100	3.7%	62.8%	$ 14	0.1%	0.4%	$ 893	1.5%	26.7%	$ -			$ 3,343	0.6%
Comm., Journalism & Library Sci	$ 98		92.5%	$ -	0.0%	0.0%	$ -		0.0%	$ 8	0.0%	7.5%	$ -			$ 106	0.0%
Social Work	$ -		#DIV/0!	$ -		#DIV/0!	$ -		#DIV/0!	$ -			$ -			$ -	
Other Non-Science and Engin.	$ -		0.0%	$ -	0.0%	0.0%	$ -	0.0%	0.0%	$ 1,821	3.1%	100.0%	$ -			$ 1,821	0.3%
TOTAL, NON-SCI & ENG FIELDS	**$ 4,289**	**2.5%**	**15.9%**	**$ 17,029**	**30.2%**	**63.2%**	**$ 1,413**	**5.5%**	**5.2%**	**$ 4,225**	**7.1%**	**15.7%**	**$ -**			**$ 26,956**	**5.0%**
TOTAL, SCI & ENG FIELDS	**$ 164,854**	**97.5%**	**32.0%**	**$ 39,387**	**69.8%**	**7.6%**	**$ 24,312**	**94.5%**	**4.7%**	**$ 55,120**	**92.9%**	**10.7%**	**$ 232,039**	**100.0%**	**45.0%**	**$ 515,712**	**95.0%**
GRAND TOTAL	**$ 169,143**		**31.2%**	**$ 56,416**		**10.4%**	**$ 25,725**		**4.7%**	**$ 59,345**		**10.9%**	**$ 232,039**		**42.8%**	**$ 542,668**	**100.0%**

Source: Campus NSF surveys. All dollars are in thousands.

Note: Percent of Total is the percentage each field represents of total campus or system R&D expenditures in all fields.

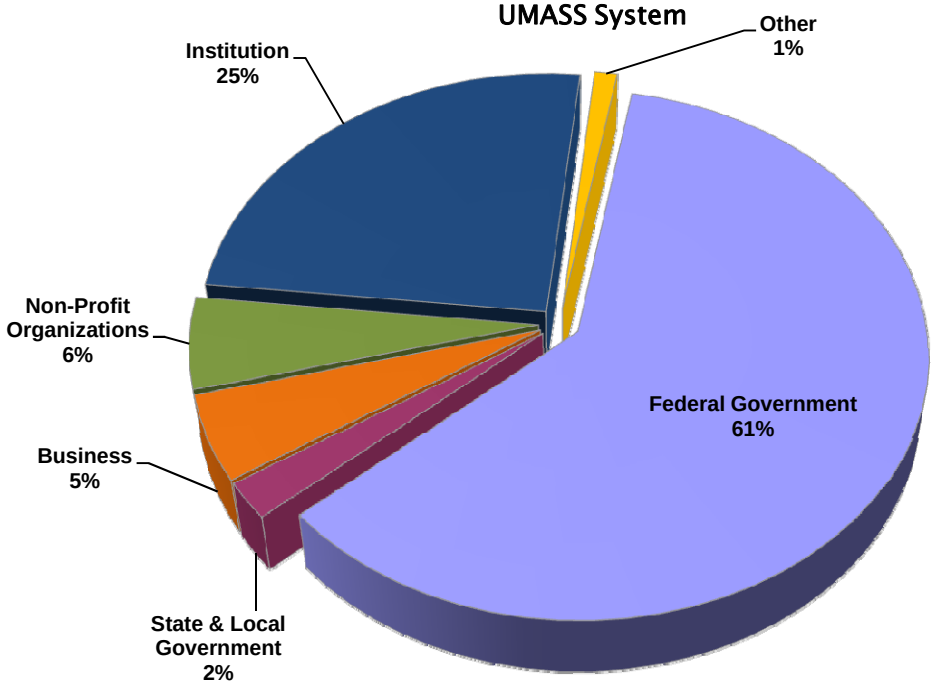
Percent of Field is the percentage of the UMass system's expenditures in a particular field represented by that campus.

Total R&D Expenditures
UMASS System FY2006 – FY2010



	FY2006	FY2007	FY2008	FY2009	FY2010
UM Amherst	$140,184	$146,323	$156,817	$160,666	$169,143
UM Boston	$22,347	$37,441	$38,018	$47,028	$56,416
UM Dartmouth	$20,389	$20,120	$20,925	$20,669	$25,725
UM Lowell	$29,383	$36,117	$40,873	$56,664	$59,345
UM Worcester	$156,452	$157,469	$178,614	$204,033	$232,039

Total R&D Expenditures
by Source of Funds FY2010
UMASS System



Source: Campus NSF surveys. All dollars are in thousands.

R&D Expenditures by Source

	FY2005-FY2009									FY 2010
	Total R&D Expenditures (S&E)									Total R&D Expenditures (S&E and Non S&E)
	FY05	FY06	FY07	FY08	FY09	5-Year Change FY05 - FY09		1-Year Change FY08 - FY09		FY10
						$	%	$	%	
Amherst	$127,487	$136,057	$141,351	$152,884	$156,216	$28,729	22.5%	$3,332	2.2%	$169,143
Boston	$18,148	$21,056	$25,952	$30,272	$36,637	$18,489	101.9%	$6,365	21.0%	$56,416
Dartmouth	$19,452	$19,171	$19,538	$20,431	$19,343	-$109	-0.6%	-$1,088	-5.3%	$25,725
Lowell	$23,852	$27,635	$34,824	$36,486	$52,431	$28,579	119.8%	$15,945	43.7%	$59,345
Worcester	$149,267	$156,452	$157,469	$178,614	$204,033	$54,766	36.7%	$25,419	14.2%	$232,039
System	**$338,206**	**$360,371**	**$379,134**	**$418,687**	**$468,660**	**$130,454**	**38.6%**	**$49,973**	**11.9%**	**$542,668**
	Federal R&D Expenditures (S&E)									Federal R&D Expenditures (S&E and Non S&E)
	FY05	FY06	FY07	FY08	FY09	5-Year Change FY05 - FY09		1-Year Change FY08 - FY09		FY10
						$	%	$	%	
Amherst	$66,921	$69,642	$71,974	$79,736	$80,163	$13,242	19.8%	$427	0.5%	$89,413
Boston	$6,326	$8,610	$9,152	$12,001	$13,536	$7,210	114.0%	$1,535	12.8%	$24,527
Dartmouth	$9,852	$9,515	$11,456	$13,087	$9,667	-$185	-1.9%	-$3,420	-26.1%	$12,236
Lowell	$17,608	$18,741	$20,045	$22,406	$23,083	$5,475	31.1%	$677	3.0%	$25,550
Worcester	$130,680	$136,141	$131,226	$145,113	$145,834	$15,154	11.6%	$721	0.5%	$178,293
System	**$231,387**	**$242,649**	**$243,853**	**$272,343**	**$272,283**	**$40,896**	**17.7%**	**-$60**	**0.0%**	**$330,019**
	State & Local Government R&D Expenditures (S&E)									State & Local R&D Expenditures (S&E and Non S&E)
	FY05	FY06	FY07	FY08	FY09	5-Year Change FY05 - FY09		1-Year Change FY08 - FY09		FY10
						$	%	$	%	
Amherst	$3,873	$5,684	$5,638	$4,699	$5,439	$1,566	40.4%	$740	15.7%	$4,657
Boston	$2,481	$1,662	$1,207	$701	$949	-$1,532	-61.7%	$248	35.4%	$3,652
Dartmouth	$5,039	$5,069	$2,210	$1,641	$1,312	-$3,727	-74.0%	-$329	-20.0%	$657
Lowell	$180	$601	$969	$1,088	$1,466	$1,286	714.4%	$378	34.7%	$1,910
Worcester	$139	$35	$0	$895	$5,265	$5,126	3687.8%	$4,370	488.3%	$1,506
System	**$11,712**	**$13,051**	**$10,024**	**$9,024**	**$14,431**	**$2,719**	**23.2%**	**$5,407**	**59.9%**	**$12,382**

Source: Campus NSF surveys. All dollars are in thousands.

Note: Prior to the FY 2010 reporting cycle (FY 2005-FY 2009), R&D Expenditures data by Source represents Science and Engineering figures only; Due to changes in the NSF Survey for the FY 2010 reporting cycle (and moving forward), R&D Expenditures by Source data now comprises Total R&D Expenditures figures: Science and Engineering plus Non-Science & Engineering.

R&D Expenditures by Source (Cont'd)

FY2005-FY2009

Industry-Sponsored R&D Expenditures (S&E)

	FY05	FY06	FY07	FY08	FY09	5-Year Change FY05 - FY09 $	5-Year Change FY05 - FY09 %	1-Year Change FY08 - FY09 $	1-Year Change FY08 - FY09 %
Amherst	$4,724	$5,934	$5,195	$8,182	$8,505	$3,781	80.0%	$323	3.9%
Boston	$0	$0	$275	$552	$333	$333	NA	-$219	-39.7%
Dartmouth	$1,252	$1,680	$762	$807	$816	-$436	-34.8%	$9	1.1%
Lowell	$4,755	$4,423	$5,222	$6,299	$6,772	$2,017	42.4%	$473	7.5%
Worcester	$8,018	$9,465	$16,266	$15,192	$14,090	$6,072	75.7%	-$1,102	-7.3%
System	**$18,749**	**$21,502**	**$27,720**	**$31,032**	**$30,516**	**$11,767**	**62.8%**	**-$516**	**-1.7%**

Institutional R&D Expenditures (S&E)

	FY05	FY06	FY07	FY08	FY09	5-Year Change FY05 - FY09 $	5-Year Change FY05 - FY09 %	1-Year Change FY08 - FY09 $	1-Year Change FY08 - FY09 %
Amherst	$42,887	$45,773	$48,755	$49,556	$50,647	$7,760	18.1%	$1,091	2.2%
Boston	$6,731	$7,007	$11,122	$13,048	$15,993	$9,262	137.6%	$2,945	22.6%
Dartmouth	$3,305	$2,907	$4,855	$4,253	$7,164	$3,859	116.8%	$2,911	68.4%
Lowell	$1,309	$3,870	$8,588	$6,693	$21,110	$19,801	1512.7%	$14,417	215.4%
Worcester	$1,583	$2,377	$1,385	$2,626	$20,916	$19,333	1221.3%	$18,290	696.5%
System	**$55,815**	**$61,934**	**$74,705**	**$76,176**	**$115,830**	**$60,015**	**107.5%**	**$39,654**	**52.1%**

Other R&D Expenditures (S&E)

	FY05	FY06	FY07	FY08	FY09	5-Year Change FY05 - FY09 $	5-Year Change FY05 - FY09 %	1-Year Change FY08 - FY09 $	1-Year Change FY08 - FY09 %
Amherst	$9,082	$9,024	$9,789	$10,711	$11,462	$2,380	26.2%	$751	7.0%
Boston	$2,610	$3,777	$4,196	$3,970	$5,826	$3,216	123.2%	$1,856	46.8%
Dartmouth	$4	$0	$255	$643	$384	$380	9500.0%	-$259	-40.3%
Lowell	$0	$0	$0	$0	$0	$0	NA	$0	NA
Worcester	$8,847	$8,434	$8,592	$14,788	$17,928	$9,081	102.6%	$3,140	21.2%
System	**$20,543**	**$21,235**	**$22,832**	**$30,112**	**$35,600**	**$15,057**	**73.3%**	**$5,488**	**18.2%**

FY 2010

Industry-Sponsored R&D Expenditures (S&E and Non S&E)

	FY10 Business	FY10 Non-Profits	FY10 Total
Amherst	$9,080	$7,644	$16,724
Boston	$91	$5,902	$5,993
Dartmouth	$633	$392	$1,025
Lowell	$4,460	$1,779	$6,239
Worcester	$14,198	$14,524	$28,722
System	**$28,462**	**$30,241**	**$58,703**

Institutional R&D Expenditures (S&E and Non S&E)

	FY10
Amherst	$52,426
Boston	$21,997
Dartmouth	$11,807
Lowell	$25,583
Worcester	$23,518
System	**$135,331**

Other R&D Expenditures (S&E and Non S&E)

	FY10
Amherst	$5,923
Boston	$247
Dartmouth	$0
Lowell	$63
Worcester	$0
System	**$6,233**

Source: Campus NSF surveys. All dollars are in thousands.

Note: Prior to the FY 2010 reporting cycle (FY 2005-FY 2009), R&D Expenditures data by Source represents Science and Engineering figures only; Due to changes in the NSF Survey for the FY 2010 reporting cycle (and moving forward), R&D Expenditures by Source data now comprises Total R&D Expenditures figures: Science and Engineering plus Non-Science & Engineering.

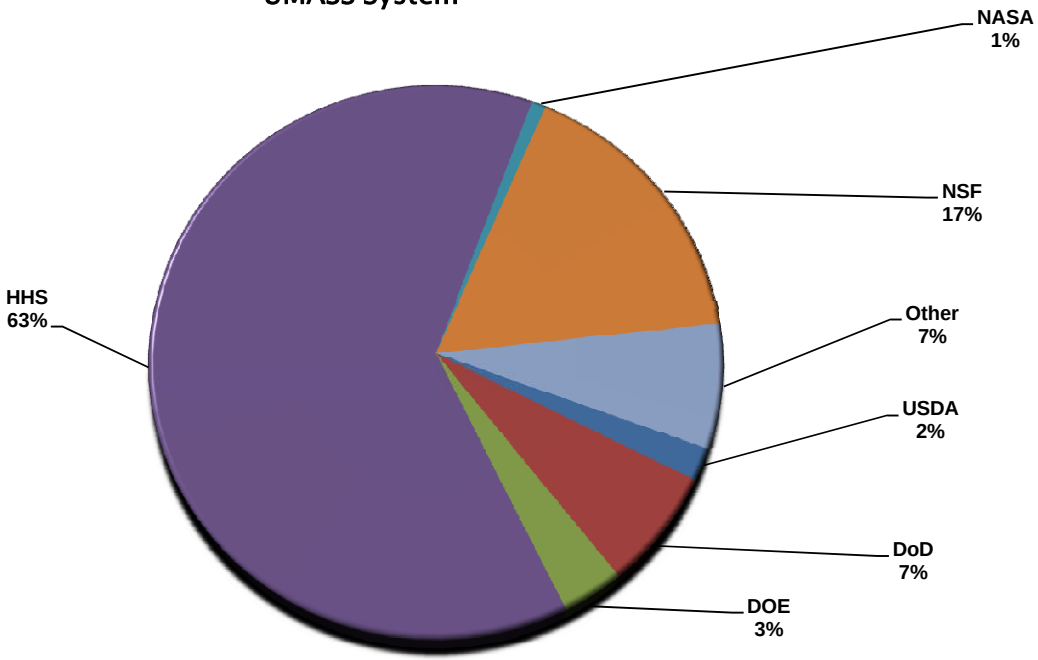
Total R&D Expenditures

Percent Basic Research FY2010

FY10 Basic Research as a Percent of:		
	Federal R&D	Total R&D
Amherst	60%	60%
Boston	70%	70%
Dartmouth	94%	85%
Lowell	60%	60%
Worcester	50%	50%

Source: Campus NSF surveys.

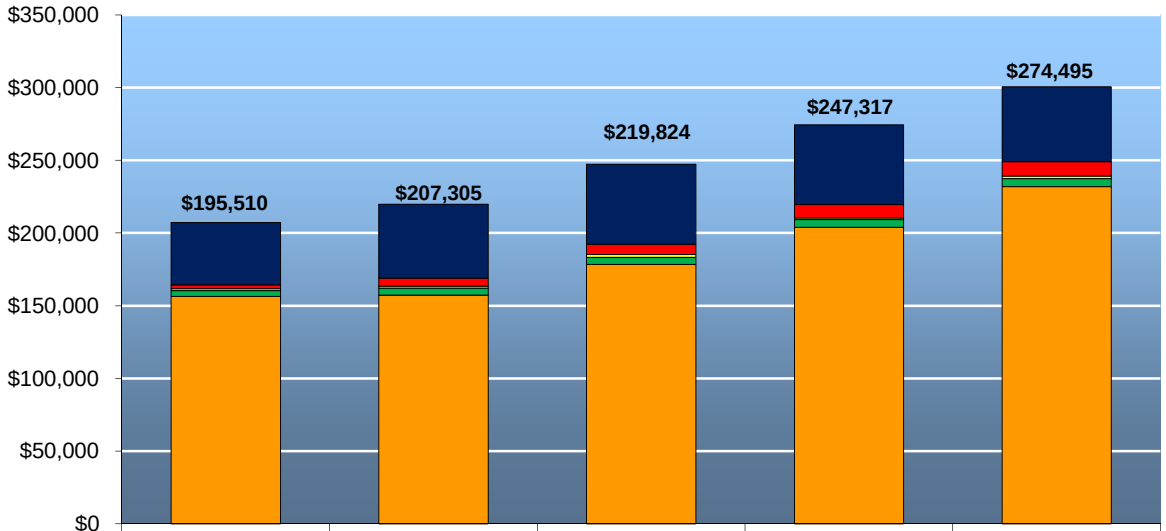
Total &D Expeditures
by Federal Government Agency Sources FY2010
UMASS System



	Total Federal $	USDA	% of Campus Total	DoD	% of Campus Total	DOE	% of Campus Total	HHS	% of Campus Total	NASA	% of Campus Total	NSF	% of Campus Total	Other	% of Campus Total
Amherst	**$ 89,413**	$ 5,655	6.3%	$ 8,285	9.3%	$ 9,700	10.8%	$ 18,872	21.1%	$ 1,684	1.9%	$ 41,152	46.0%	$ 4,065	4.5%
Boston	**$ 24,527**	$ 94	0.4%	$ 682	2.8%	$ 433	1.8%	$ 8,332	34.0%	$ 137	0.6%	$ 5,902	24.1%	$ 8,947	36.5%
Dartmouth	**$ 12,236**	$ 611	5.0%	$ 1,896	15.5%	$ 371	3.0%	$ 605	4.9%	$ 47	0.4%	$ 2,451	20.0%	$ 6,255	51.1%
Lowell	**$ 25,550**	$ -	0.0%	$ 10,279	40.2%	$ 724	2.8%	$ 5,002	19.6%	$ 369	1.4%	$ 5,105	20.0%	$ 4,071	15.9%
Worcester	**$ 178,293**	$ -	0.0%	$ 1,470	0.8%	$ -	0.0%	$ 174,893	98.1%	$ 528	0.3%	$ 641	0.4%	$ 761	0.4%
System	**$ 330,019**	**$ 6,360**	1.9%	**$ 22,612**	6.9%	**$ 11,228**	3.4%	**$ 207,704**	62.9%	**$ 2,765**	0.8%	**$ 55,251**	16.7%	**$ 24,099**	7.3%

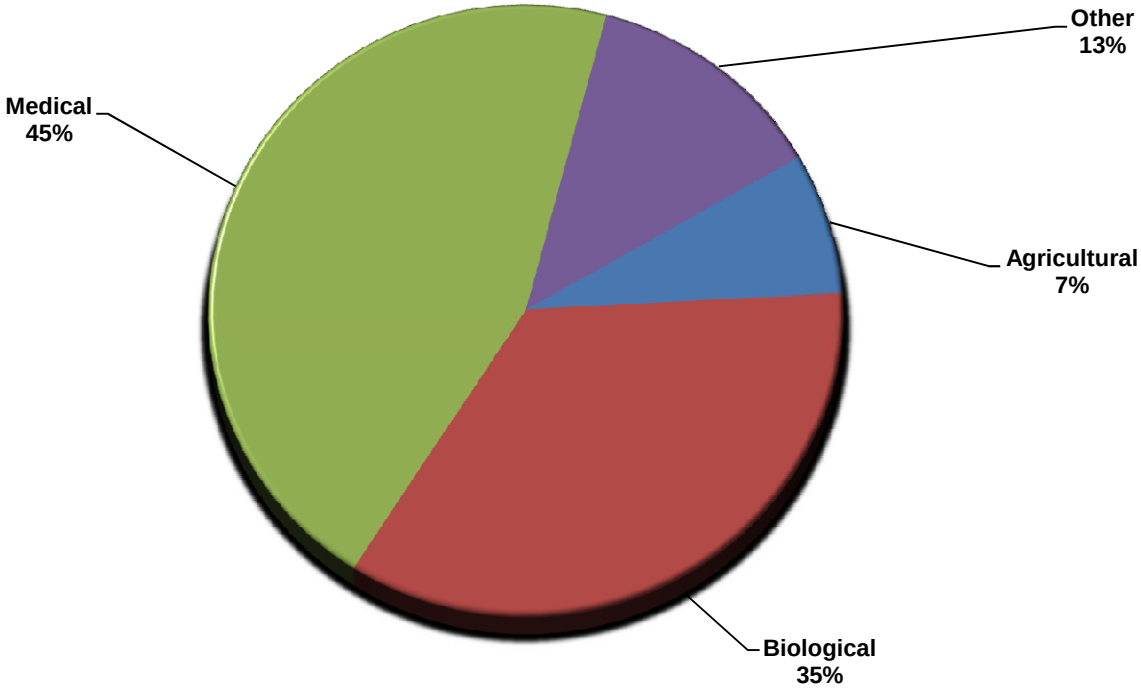
Source: Campus NSF surveys. All dollars are in thousands.
Note: HHS includes NIH

Life Sciences R&D Expenditures
UMASS System FY2006 – FY2010



	FY06	FY07	FY08	FY09	FY10
Amherst	$42,797	$50,796	$54,886	$54,733	$51,328
Boston	$2,626	$5,517	$7,138	$9,237	$9,916
Dartmouth	$1,319	$1,228	$1,925	$1,286	$1,798
Lowell	$4,111	$4,814	$4,754	$5,206	$5,521
Worcester	$156,452	$157,469	$178,614	$204,033	$232,039

Life Sciences R&D Expenditures
by Field FY2010
UMASS System



Source: Campus NSF surveys. All dollars are in thousands.

Life Sciences R&D Expenditures by Field
FY2006 – FY2010

	Life Sciences R&D Expenditures								
						5-Year Change FY06 - FY10		1-Year Change FY09 - FY10	
	FY06	FY07	FY08	FY09	FY10	$	%	$	%
Amherst	$42,797	$50,796	$54,886	$54,733	$51,328	$8,531	19.9%	-$3,405	-6.2%
Boston	$2,626	$5,517	$7,138	$9,237	$9,916	$7,290	277.6%	$679	7.4%
Dartmouth	$1,319	$1,228	$1,925	$1,286	$1,798	$479	36.3%	$512	39.8%
Lowell	$4,111	$4,814	$4,754	$5,206	$5,521	$1,410	34.3%	$315	6.1%
Worcester	$156,452	$157,469	$178,614	$204,033	$232,039	$75,587	48.3%	$28,006	13.7%
System	**$207,305**	**$219,824**	**$247,317**	**$274,495**	**$300,602**	**$93,297**	**45.0%**	**$26,107**	**9.5%**

	Agricultural								
						5-Year Change FY06 - FY10		1-Year Change FY09 - FY10	
	FY06	FY07	FY08	FY09	FY10	$	%	$	%
Amherst	$19,183	$20,795	$24,478	$23,088	$21,710	$2,527	13.2%	-$1,378	-6.0%
Boston	$0	$0	$0	$0	$0	$0		$0	
Dartmouth	$744	$739	$602	$531	$645	-$99	-13.3%	$114	21.5%
Lowell	$0	$0	$0	$0	$0	$0		$0	
Worcester	$0	$0	$0	$0	$0	$0		$0	
System	**$19,927**	**$21,534**	**$25,080**	**$23,619**	**$22,355**	**$2,428**	**12.2%**	**-$1,264**	**-5.4%**

	Biological								
						5-Year Change FY06 - FY10		1-Year Change FY09 - FY10	
	FY06	FY07	FY08	FY09	FY10	$	%	$	%
Amherst	$17,996	$22,757	$22,823	$23,323	$22,495	$4,499	25.0%	-$828	-3.6%
Boston	$1,439	$2,345	$3,384	$3,020	$2,537	$1,098	76.3%	-$483	-16.0%
Dartmouth	$263	$465	$970	$711	$1,120	$857	325.9%	$409	57.5%
Lowell	$885	$1,378	$1,477	$1,531	$1,281	$396	44.7%	-$250	-16.3%
Worcester	$61,571	$56,562	$63,980	$72,851	$77,718	$16,147	26.2%	$4,867	6.7%
System	**$82,154**	**$83,507**	**$92,634**	**$101,436**	**$105,151**	**$22,997**	**28.0%**	**$3,715**	**3.7%**

Life Sciences R&D Expenditures by Field
FY2006 – FY2010

	Medical								
						5-Year Change FY06 - FY10		1-Year Change FY09 - FY10	
	FY06	FY07	FY08	FY09	FY10	$	%	$	%
Amherst	$3,191	$5,401	$6,575	$7,237	$6,410	$3,219	100.9%	-$827	-11.4%
Boston	$0	$2,984	$2,934	$3,493	$4,697	$4,697		$1,204	34.5%
Dartmouth	$0	$0	$0	$0	$0	$0		$0	
Lowell	$0	$0	$0	$0	$0	$0		$0	
Worcester	$76,250	$82,470	$93,501	$104,417	$124,323	$48,073	63.0%	$19,906	19.1%
System	**$79,441**	**$90,855**	**$103,010**	**$115,147**	**$135,430**	**$55,989**	**70.5%**	**$20,283**	**17.6%**

	Other Life Sciences								
						5-Year Change FY06 - FY10		1-Year Change FY09 - FY10	
	FY06	FY07	FY08	FY09	FY10	$	%	$	%
Amherst	$2,427	$1,843	$1,010	$1,085	$713	-$1,714	-70.6%	-$372	-34.3%
Boston	$1,187	$188	$820	$2,724	$2,682	$1,495	125.9%	-$42	-1.5%
Dartmouth	$312	$24	$353	$44	$33	-$279	-89.4%	-$11	-25.0%
Lowell	$3,226	$3,436	$3,277	$3,675	$4,240	$1,014	31.4%	$565	15.4%
Worcester	$18,631	$18,437	$21,133	$26,765	$ 29,998	$11,367	61.0%	$3,233	12.1%
System	**$25,783**	**$23,928**	**$26,593**	**$34,293**	**$ 37,666**	**$11,883**	**46.1%**	**$3,373**	**9.8%**

Source: Campus NSF surveys and WebCASPAR. All dollars are in thousands.