



FY2011 ANNUAL R&D EXPENDITURES REPORT

Office of Institutional Research
UMASS President's Office
April 2012



The University of Massachusetts

Amherst • Boston • Dartmouth • Lowell • Worcester • UMassOnline

TOTAL R&D EXPENDITURES – UMASS SYSTEM AND CAMPUSES

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Introduction

The *FY2011 Annual Research and Development Expenditures Report* presents information on the research and development expenditures for the University of Massachusetts System. 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 as the annual Survey of Research and Development Expenditures at Universities and Colleges). In addition to the FY2011 data, this report also provides trend data in many cases.

The report is comprised of two sections: Total R&D Expenditures (pages 1-13) and Life Sciences R&D Expenditures (pages 14-15).

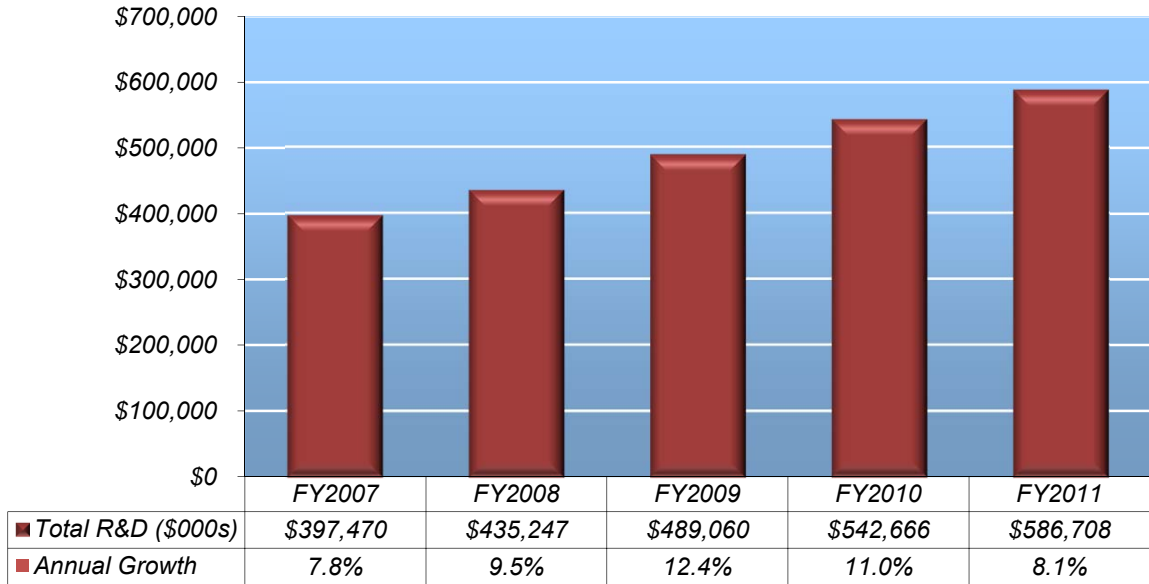
Major Highlights:

- **UMASS Total R&D Expenditures** – Total FY2011 R&D Expenditures for the University of Massachusetts System was reported at \$586.7 million, which represents an 8.1% increase from the FY2010 total of \$542.7 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 FY2010 (most recent comparison data available), while the UMASS system reflected an annual growth rate of 11% over the previous year, All U.S. Institutions reflected a growth rate of 6.9%.
- **UMASS R&D Expenditures in Science and Engineering** – In FY2011, an estimated \$550.1 million (94%) of our R&D expenditures were in the sciences and engineering (S&E).
- **UMASS State Ranking in Total R&D Expenditures** – Among Massachusetts colleges and universities, UMASS ranked 3rd in Total R&D Expenditures, behind only MIT and Harvard. In 2010, UMASS comprised one-fifth (20%) of the Total Expenditures of all MA institutions. UMASS, MIT, Harvard and BU together account for 78% of the academic science and engineering R&D expenditures in the state. (Rankings based on FY2010 data).
- **UMASS R&D Expenditures by Funding Source (FY2011)** – In terms of funding sources, 65% is from the federal government, 24% is from institutional sources, 2% is from state and local government, 4% from businesses, 5% from non-profit organizations, and less than 1% is from other sources (e.g., private foundations).
- **UMASS Areas of Funding Growth** – Between the reporting cycles FY2010-11, industry/business sponsorship and institutional funds dropped slightly (by 2 and 1 percentage points respectively, to 9% and 24% of all funds). State and local government funding remained steady at 2% of all funds. Federal funding increased by 5 percentage points from 61% to 66% of all funds.
- **Life Sciences Continues to Comprise More Than Half of all R&D Expenditures at UMASS** – At \$344 million, the life sciences constitute more than half of UMASS's total R&D expenditures (58.7%). FY2011 distribution of R&D expenditures by field is:

Life Sciences	58.7%	Social Sciences	3.1%
Physical Sciences	8.7%	Non Sciences/Engineering	6.2%
Engineering	12.1%	Psychology	2.2%
Computer Sciences	3.8%	Mathematical Sciences	0.7%
Environmental Sciences	3.9%	Other Sciences	0.6%

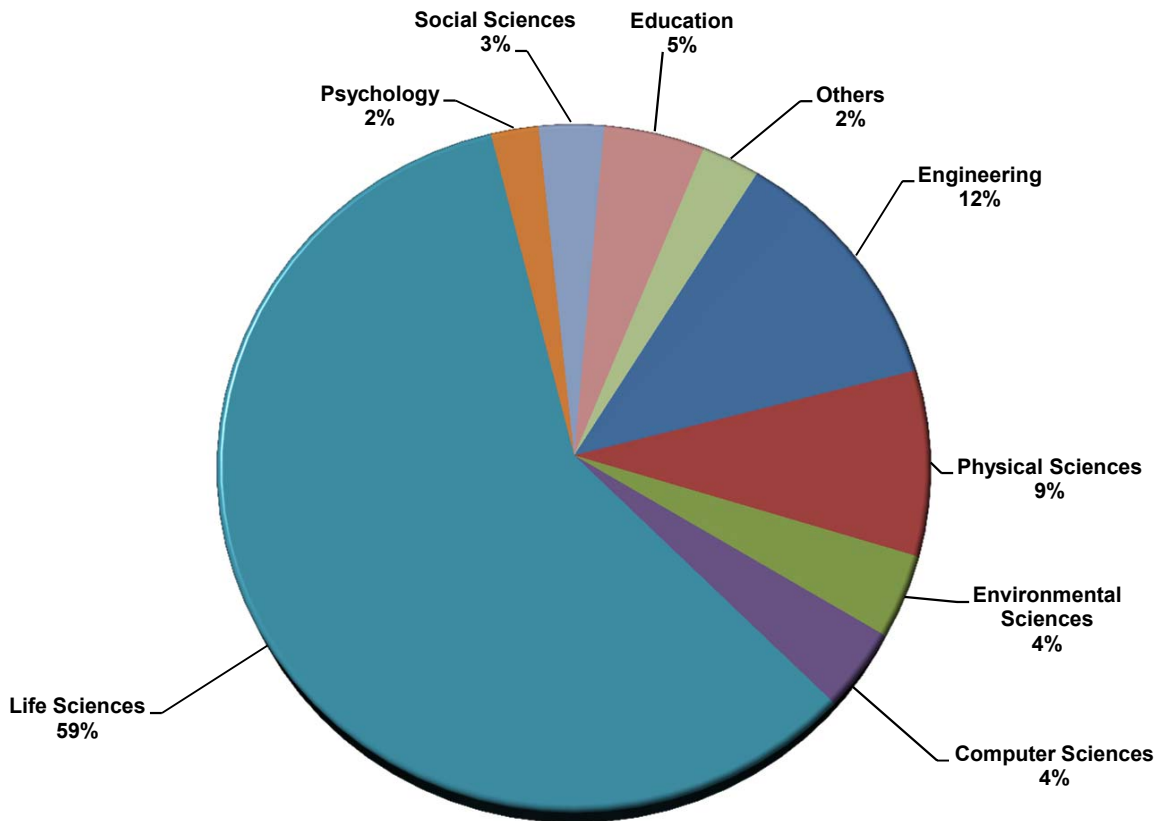
UMASS System

Total R&D Expenditures FY2007 - FY2011



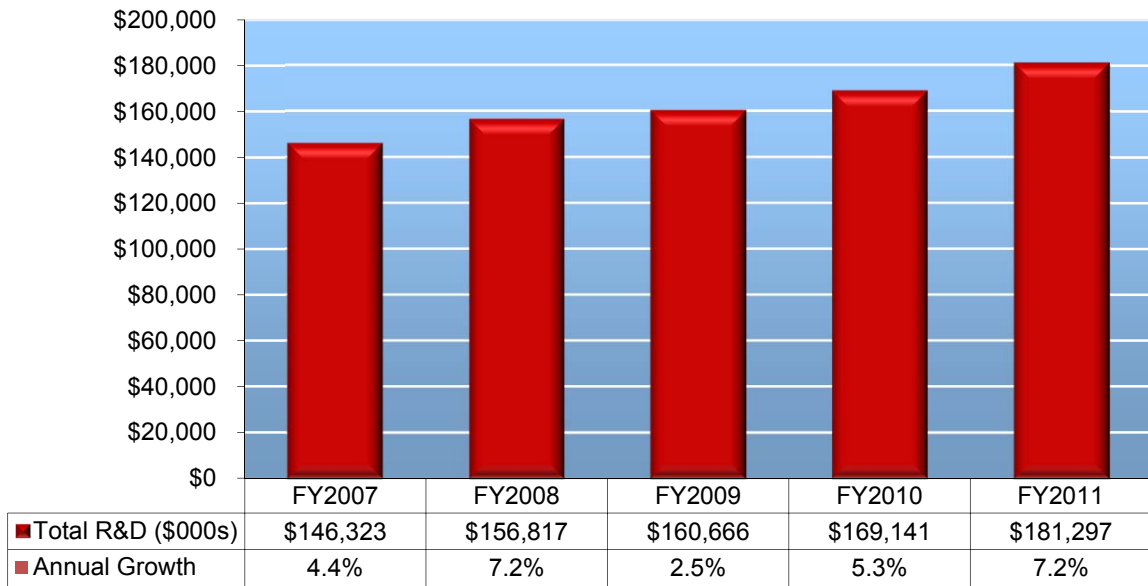
FY 2010 figures have been revised from the FY 2010 R&D Report publication (\$542,668).

Total R&D Expenditures FY2011



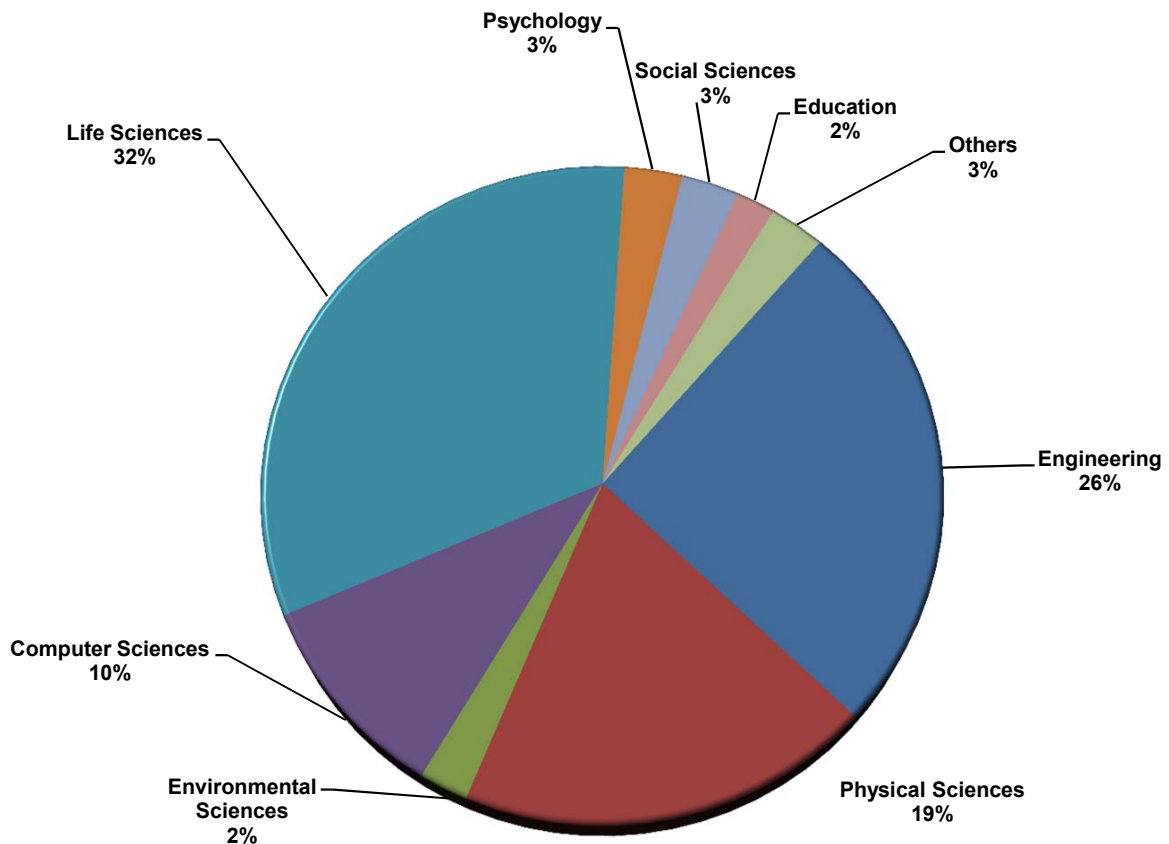
Amherst

Total R&D Expenditures FY2007 – FY2011



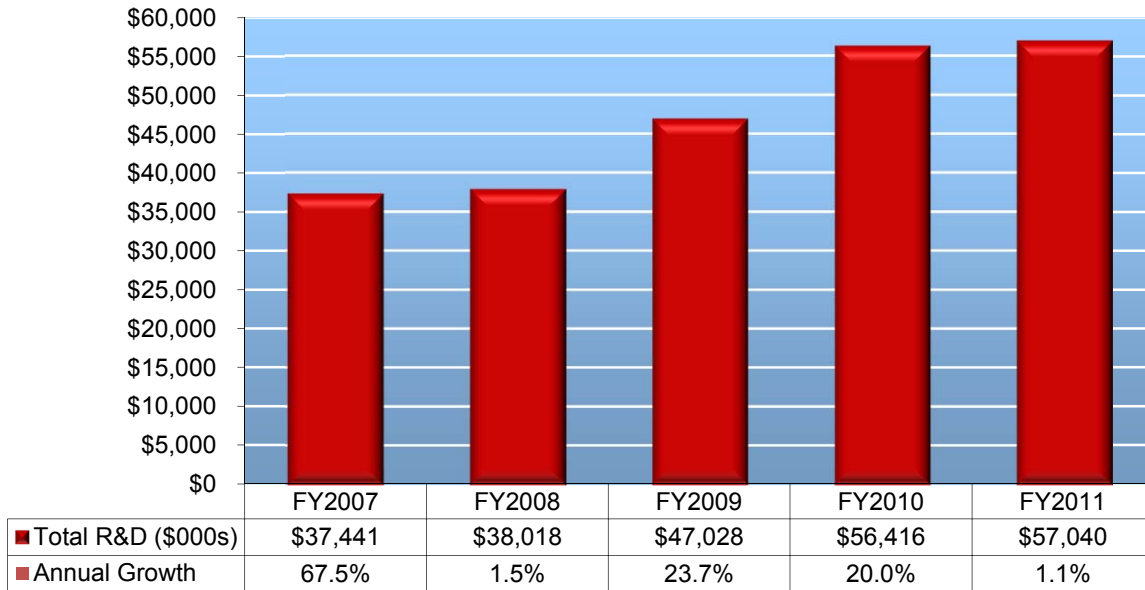
Note: UMA FY2010 figures have been revised since the FY2010 R&D Report publication.

Total R&D Expenditures FY2011

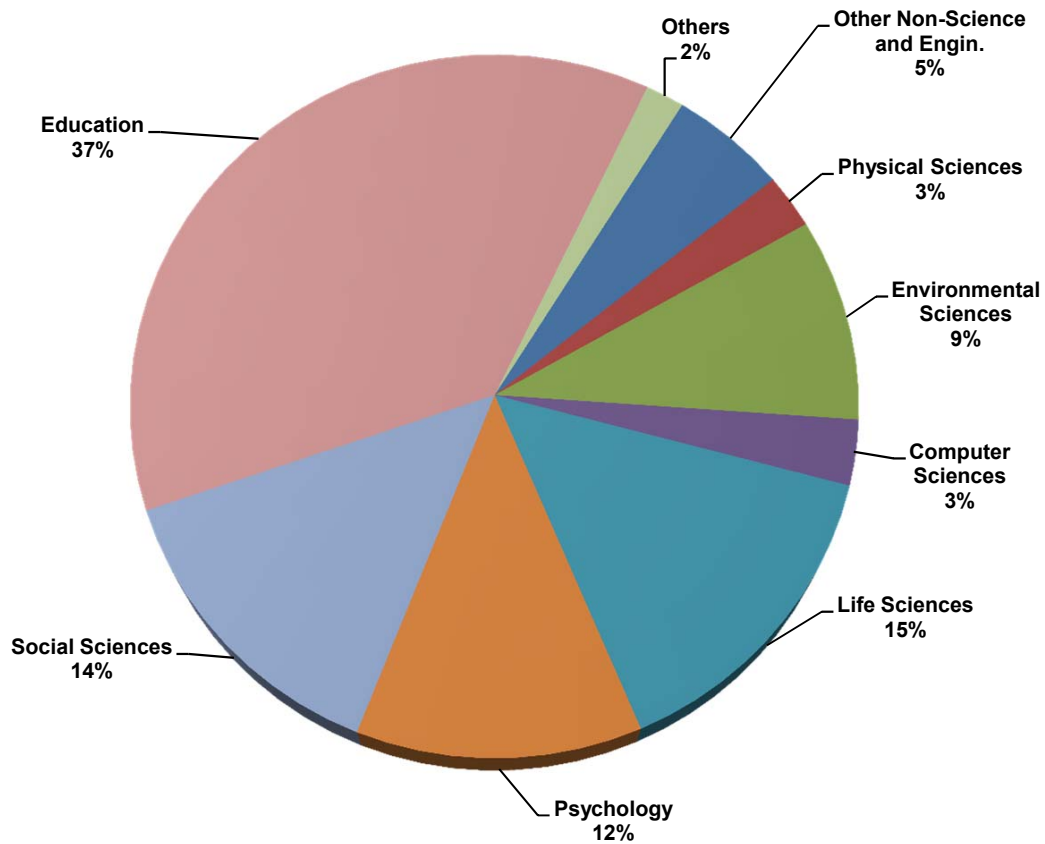


Boston

Total R&D Expenditures FY2007 – FY2011

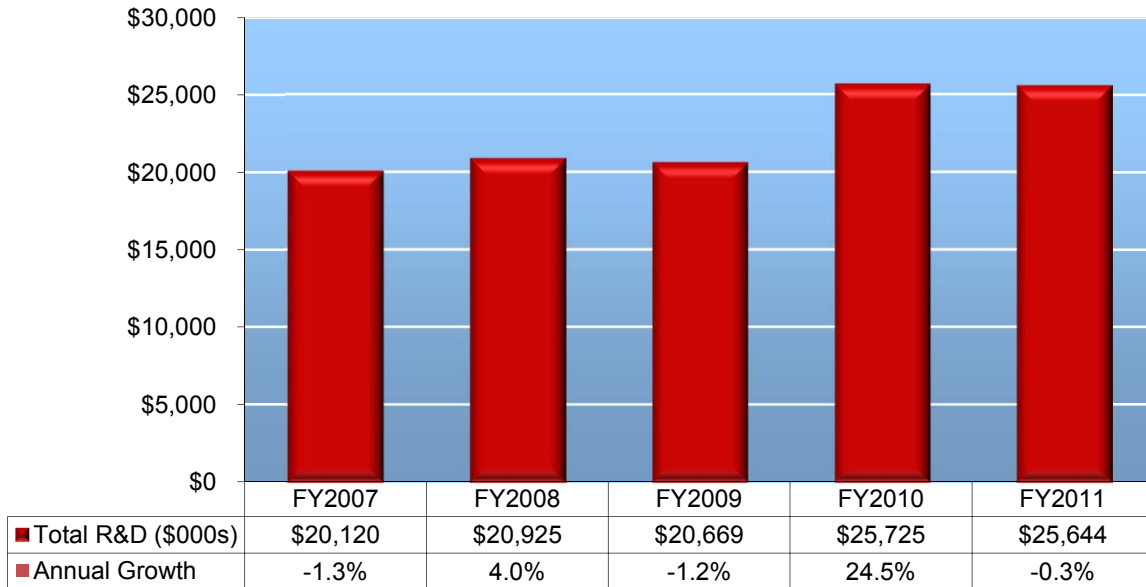


Total R&D Expenditures FY2011

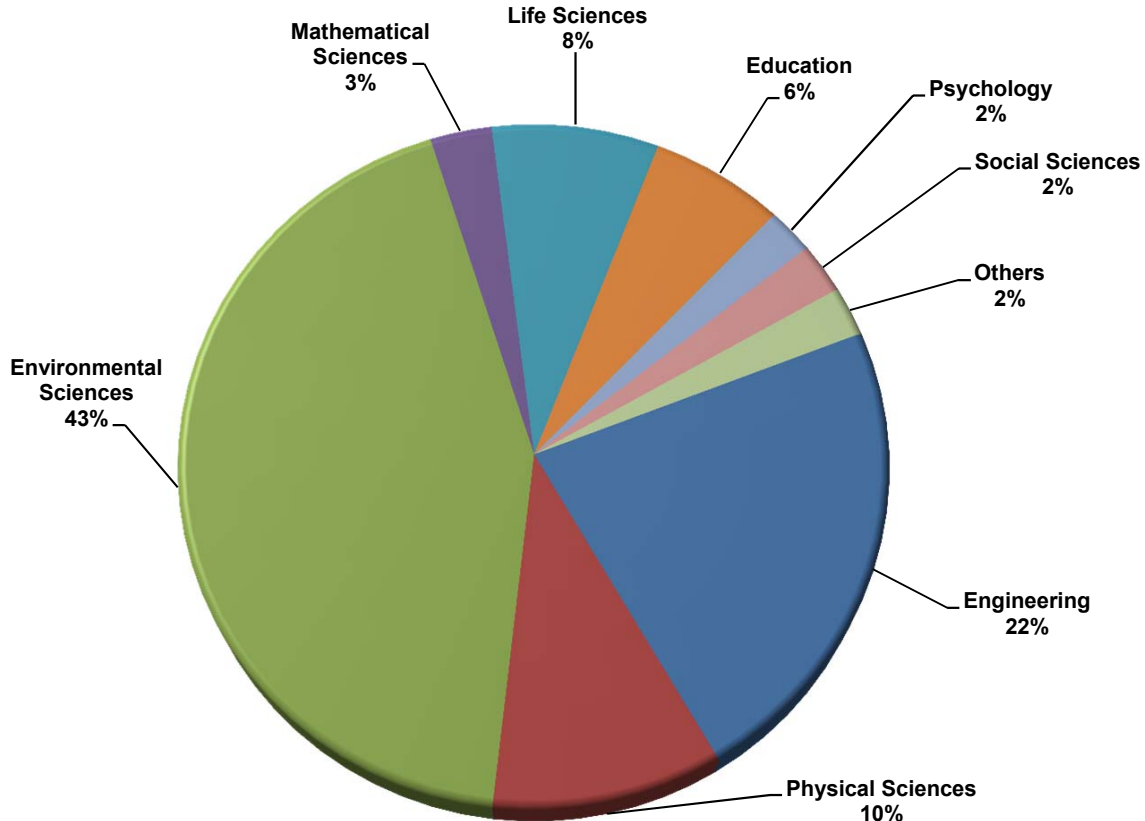


Dartmouth

Total R&D Expenditures FY2007 – FY2011

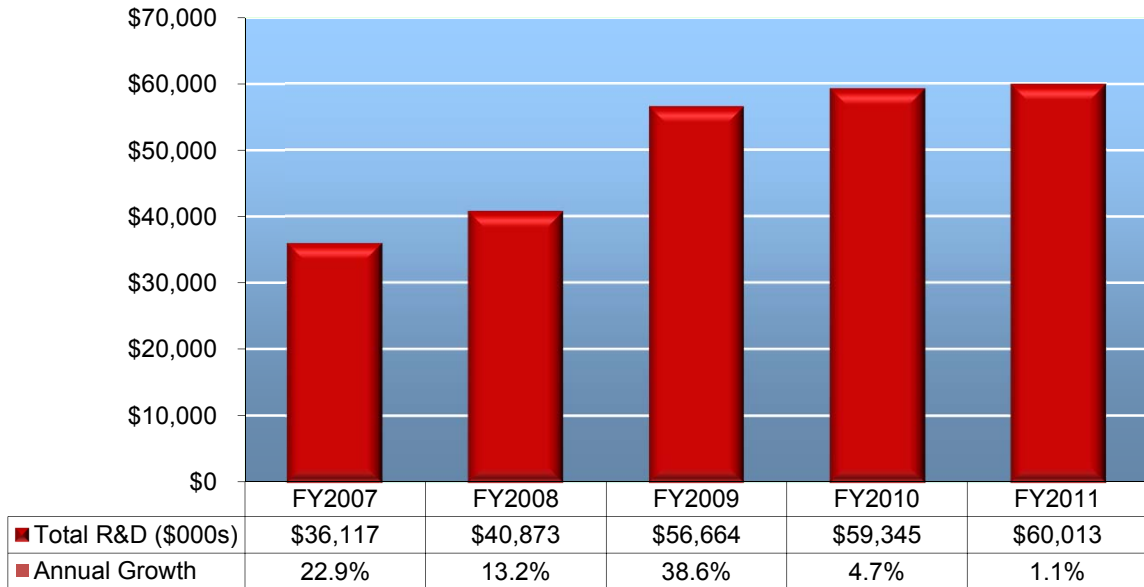


Total R&D Expenditures FY2011

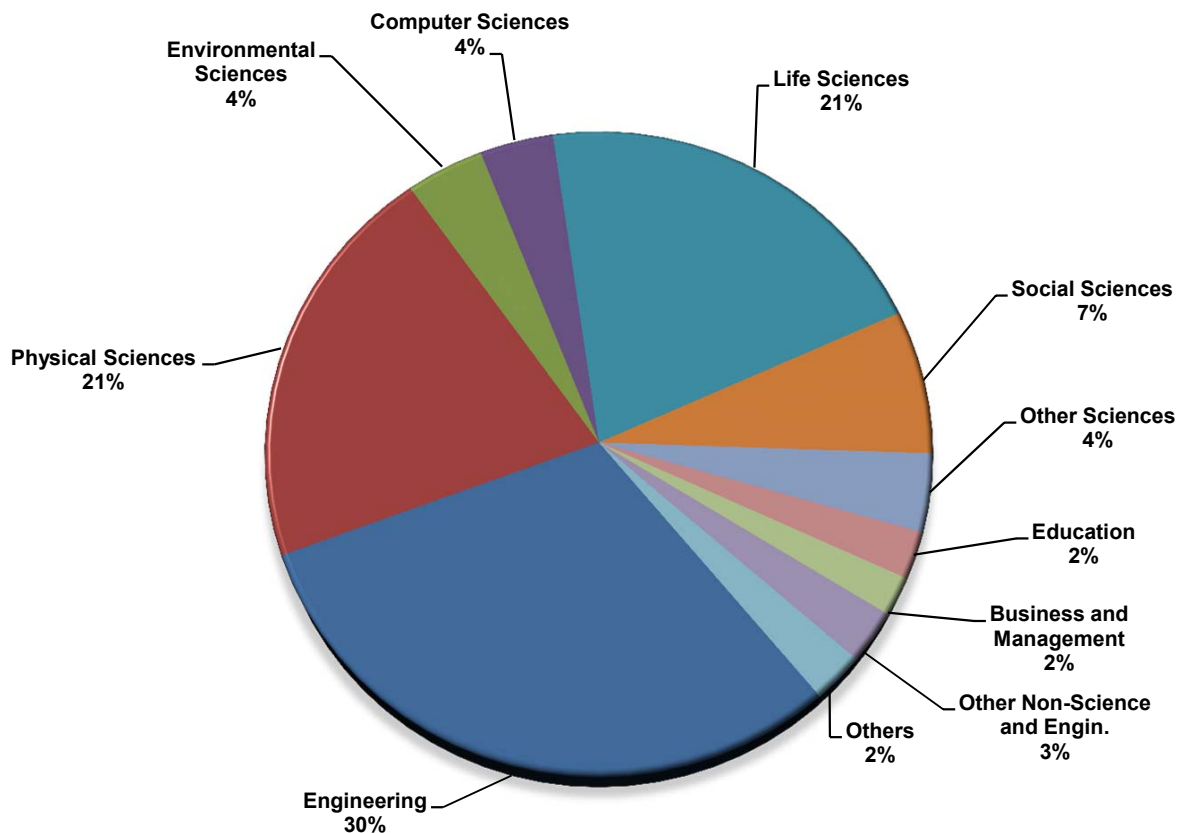


Lowell

Total R&D Expenditures FY2007 - FY2011

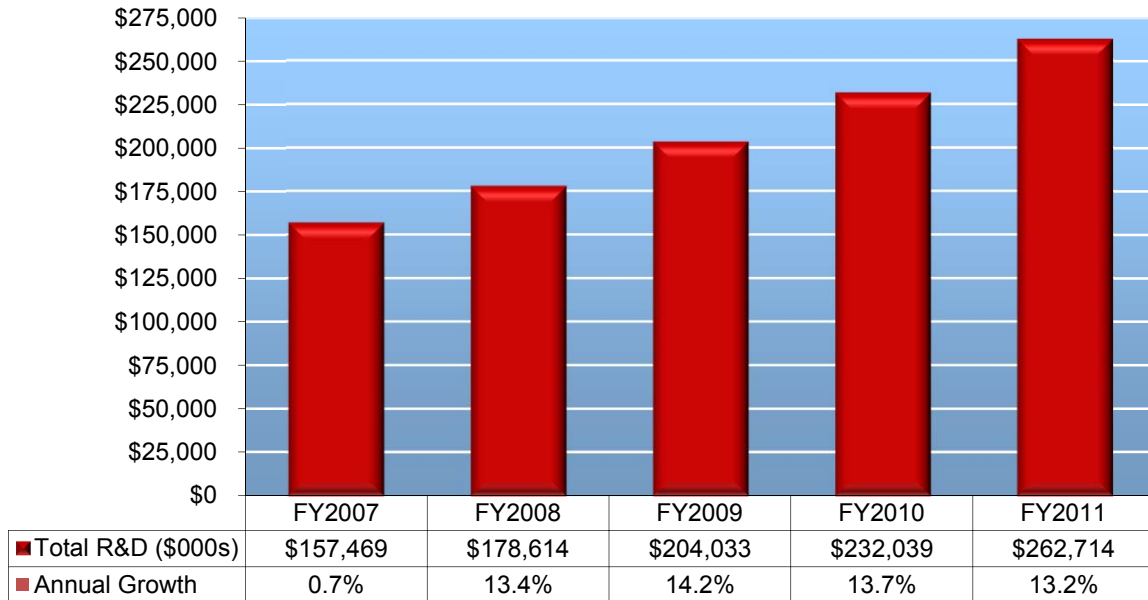


Total R&D Expenditures FY2011



Worcester

Total R&D Expenditures FY2007 – FY2011



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

Total R&D Expenditures By Field FY2011

FIELD	UMA FY2011	% of UMA Total	% of Field	UMB FY2011	% of UMB Total	% of Field	UMD FY2011	% of UMD Total	% of Field	UML FY2011	% of UML Total	% of Field	UMW FY2011	% of UMW Total	% of Field	System FY2011	% of Total
Engineering (Total)	\$ 46,669	25.7%	65.8%	\$ 225	0.4%	0.3%	\$ 5,748	22.4%	8.1%	\$ 18,295	30.5%	25.8%	\$ 0			\$ 70,937	12.1%
Aeronautical & Astronomical	\$ 0			\$ 0			\$ 0			\$ 0			\$ 0			\$ 0	
Bioengineering/Biomedical	\$ 0			\$ 0			\$ 197	0.8%	23.6%	\$ 637	1.1%	76.4%	\$ 0			\$ 834	0.1%
Chemical	\$ 15,724	8.7%	91.3%	\$ 0			\$ 0			\$ 1,492	2.5%	8.7%	\$ 0			\$ 17,216	2.9%
Civil	\$ 8,169	4.5%	81.2%	\$ 0			\$ 837	3.3%	8.3%	\$ 1,055	1.8%	10.5%	\$ 0			\$ 10,061	1.7%
Electrical	\$ 16,123	8.9%	70.0%	\$ 225	0.4%	1.0%	\$ 1,236	4.8%	5.4%	\$ 5,447	9.1%	23.7%	\$ 0			\$ 23,031	3.9%
Mechanical	\$ 6,186	3.4%	62.6%	\$ 0			\$ 734	2.9%	7.4%	\$ 2,958	4.9%	29.9%	\$ 0			\$ 9,878	1.7%
Metallurgical & Materials	\$ 0			\$ 0			\$ 620	2.4%	13.7%	\$ 3,920	6.5%	86.3%	\$ 0			\$ 4,540	0.8%
Other	\$ 467	0.3%	8.7%	\$ 0			\$ 2,124	8.3%	39.5%	\$ 2,786	4.6%	51.8%	\$ 0			\$ 5,377	0.9%
Physical Sciences (Total)	\$ 34,761	19.2%	67.8%	\$ 1,440	2.5%	2.8%	\$ 2,622	10.2%	5.1%	\$ 12,440	20.7%	24.3%	\$ 0			\$ 51,263	8.7%
Astronomy	\$ 5,198	2.9%	100.0%	\$ 0			\$ 0			\$ 0			\$ 0			\$ 5,198	0.9%
Chemistry	\$ 22,893	12.6%	81.1%	\$ 879	1.5%	3.1%	\$ 1,715	6.7%	6.1%	\$ 2,734	4.6%	9.7%	\$ 0			\$ 28,221	4.8%
Physics	\$ 6,670	3.7%	37.4%	\$ 561	1.0%	3.1%	\$ 907	3.5%	5.1%	\$ 9,706	16.2%	54.4%	\$ 0			\$ 17,844	3.0%
Other	\$ 0			\$ 0			\$ 0			\$ 0			\$ 0			\$ 0	
Environmental Sciences (Total)	\$ 4,122	2.3%	18.0%	\$ 5,326	9.3%	23.2%	\$ 11,107	43.3%	48.5%	\$ 2,353	3.9%	10.3%	\$ 0			\$ 22,908	3.9%
Atmospheric	\$ 0			\$ 0			\$ 0			\$ 0			\$ 0			\$ 0	
Earth Sciences	\$ 3,343	1.8%	58.7%	\$ 0			\$ 0			\$ 2,353	3.9%	41.3%	\$ 0			\$ 5,696	1.0%
Oceanography	\$ 6	0.0%	0.0%	\$ 4,766	8.4%	30.0%	\$ 11,107	43.3%	69.9%	\$ 0			\$ 0			\$ 15,879	2.7%
Other	\$ 773			\$ 560	1.0%	42.0%	\$ 0			\$ 0			\$ 0			\$ 1,333	0.2%
Mathematical Sciences (Total)	\$ 2,591	1.4%	66.9%	\$ 0			\$ 742	2.9%	19.2%	\$ 539	0.9%	13.9%	\$ 0			\$ 3,872	0.7%
Computer Sciences (Total)	\$ 18,066	10.0%	81.1%	\$ 1,715	3.0%	7.7%	\$ 285	1.1%	1.3%	\$ 2,212	3.7%	9.9%	\$ 0			\$ 22,278	3.8%
Life Sciences (Total)	\$ 58,946	32.5%	17.1%	\$ 8,278	14.5%	2.4%	\$ 2,021	7.9%	0.6%	\$ 12,361	20.6%	3.6%	\$ 262,714	100.0%	76.3%	\$ 344,320	58.7%
Agricultural	\$ 28,669	15.8%	96.8%	\$ 0			\$ 946	3.7%	3.2%	\$ 0			\$ 0			\$ 29,615	5.0%
Biological	\$ 23,276	12.8%	19.9%	\$ 2,581	4.5%	2.2%	\$ 1,004	3.9%	0.9%	\$ 1,553	2.6%	1.3%	\$ 88,359	33.6%	75.7%	\$ 116,773	19.9%
Medical	\$ 6,473	3.6%	4.5%	\$ 4,675	8.2%	3.2%	\$ 0			\$ 252	0.4%	0.2%	\$ 133,598	50.9%	92.1%	\$ 144,998	24.7%
Other	\$ 528	0.3%	1.0%	\$ 1,022	1.8%	1.9%	\$ 71	0.3%	0.1%	\$ 10,556	17.6%	19.9%	\$ 40,757	15.5%	77.0%	\$ 52,934	9.0%
Psychology (Total)	\$ 5,166	2.8%	39.4%	\$ 7,035	12.3%	53.6%	\$ 555	2.2%	4.2%	\$ 361	0.6%	2.8%	\$ 0			\$ 13,117	2.2%
Social Sciences (Total)	\$ 5,123	2.8%	28.6%	\$ 7,845	13.8%	43.8%	\$ 620	2.4%	3.5%	\$ 4,340	7.2%	24.2%	\$ 0			\$ 17,928	3.1%
Economics	\$ 2,489	1.4%	71.2%	\$ 147	0.3%	4.2%	\$ 2	0.0%	0.1%	\$ 857	1.4%	24.5%	\$ 0			\$ 3,495	0.6%
Political Science	\$ 928	0.5%	18.0%	\$ 3,183	5.6%	61.7%	\$ 376	1.5%	7.3%	\$ 673	1.1%	13.0%	\$ 0			\$ 5,160	0.9%
Sociology	\$ 1,211	0.7%	38.2%	\$ 1,757	3.1%	55.4%	\$ 72	0.3%	2.3%	\$ 130	0.2%	4.1%	\$ 0			\$ 3,170	0.5%
Other	\$ 495	0.3%	8.1%	\$ 2,758	4.8%	45.2%	\$ 170	0.7%	2.8%	\$ 2,680	4.5%	43.9%	\$ 0			\$ 6,103	1.0%
Other Sciences (Total)	\$ 1,101	0.6%	31.8%	\$ 0			\$ 8	0.0%	0.2%	\$ 2,356	3.9%	68.0%	\$ 0			\$ 3,465	0.6%
TOTAL, SCI & ENG FIELDS	\$ 176,545	97.4%	32.1%	\$ 31,864	55.9%	5.8%	\$ 23,708	92.5%	4.3%	\$ 55,257	92.1%	10.0%	\$ 262,714	100.0%	47.8%	\$ 550,088	93.8%

Total R&D Expenditures By Field FY2011

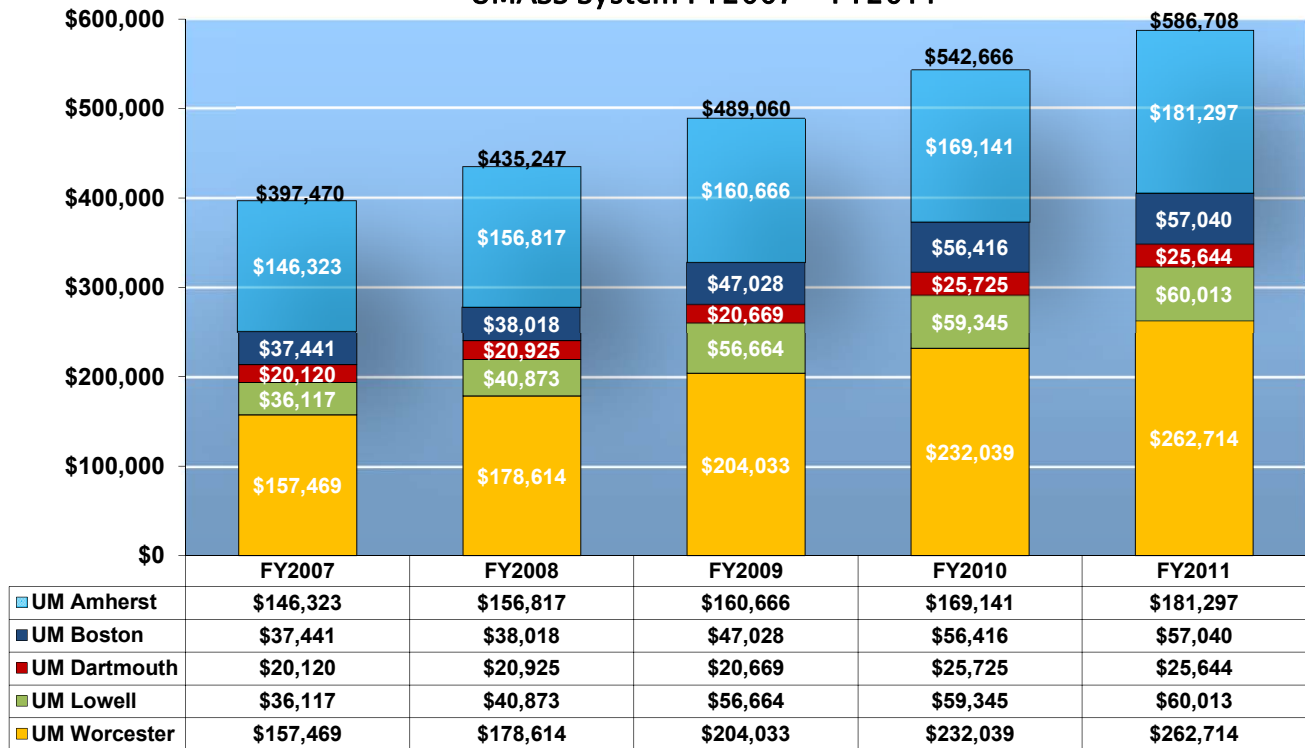
FIELD	% of UMA Total			% of UMB Total			% of UMD Total			% of UML Total			% of UMW Total			System FY2011	% of Total
		% of Field			% of Field			% of Field		% of Field		% of Field		% of Field			
Education	\$ 3,498	1.9%	12.5%	\$ 21,331	37.4%	76.5%	\$ 1,627	6.3%	5.8%	\$ 1,425	2.4%	5.1%	\$ 0		\$ 27,881	4.8%	
Law	\$ 60	0.0%	100.0%	\$ 0			\$ 0			\$ 0			\$ 0		\$ 60	0.0%	
Humanities	\$ 254	0.1%	33.6%	\$ 98	0.2%	13.0%	\$ 151	0.6%	20.0%	\$ 252	0.4%	33.4%	\$ 0		\$ 755	0.1%	
Visual and Performing Arts	\$ 46	0.0%	11.2%	\$ 35	0.1%	8.5%	\$ 16	0.1%	3.9%	\$ 315	0.5%	76.5%	\$ 0		\$ 412	0.1%	
Business and Management	\$ 423	0.2%	18.8%	\$ 653	1.1%	29.0%	\$ 0			\$ 1,174	2.0%	52.2%	\$ 0		\$ 2,250	0.4%	
Comm., Journalism & Library Sci	\$ 453	0.2%	97.2%	\$ 0			\$ 0			\$ 13	0.0%	2.8%	\$ 0		\$ 466	0.1%	
Social Work	\$ 0			\$ 0			\$ 0			\$ 0			\$ 0		\$ 0		
Other Non-Science and Engin.	\$ 18	0.0%	0.4%	\$ 3,059	5.4%	63.8%	\$ 142	0.6%	3.0%	\$ 1,577	2.6%	32.9%	\$ 0		\$ 4,796	0.8%	
TOTAL, NON-SCI & ENG FIELDS	\$ 4,752	2.6%	13.0%	\$ 25,176	44.1%	68.7%	\$ 1,936	7.5%	5.3%	\$ 4,756	7.9%	13.0%	\$ 0		\$ 36,620	6.2%	
TOTAL, SCI & ENG FIELDS	\$ 176,545	97.4%	32.1%	\$ 31,864	55.9%	5.8%	\$ 23,708	92.5%	4.3%	\$ 55,257	92.1%	10.0%	\$ 262,714	100.0%	47.8%	\$ 550,088	93.8%
GRAND TOTAL	\$ 181,297	30.9%	30.9%	\$ 57,040	9.7%	9.7%	\$ 25,644	4.4%	4.4%	\$ 60,013	10.2%	10.2%	\$ 262,714	44.8%	44.8%	\$ 586,708	100.0%

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

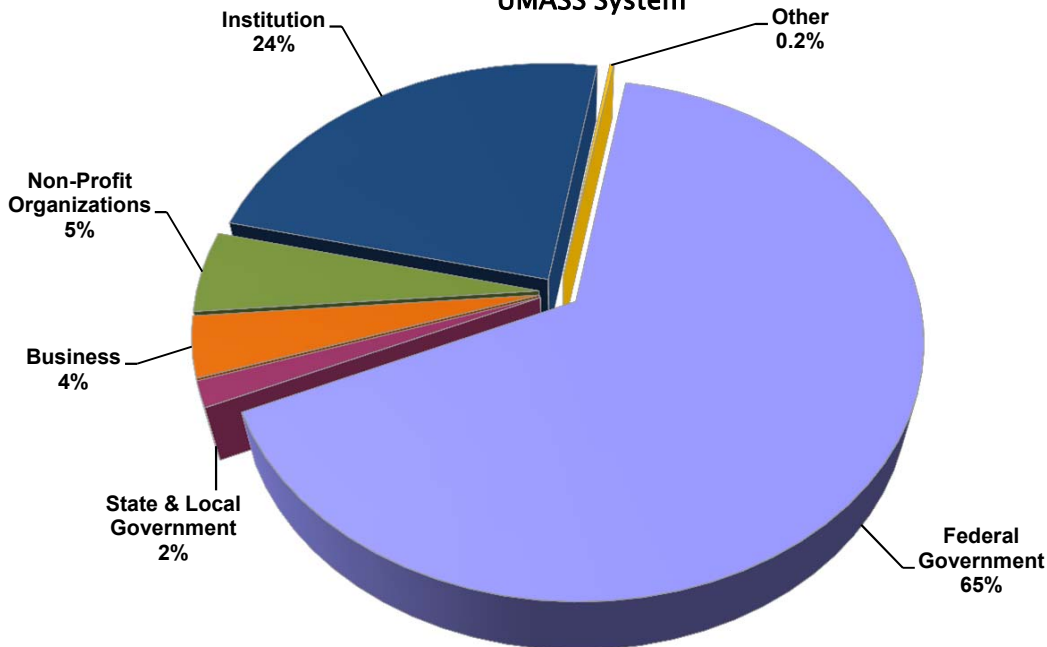
Note: Percent of Total is the percentage each field represents of total campus or system R&D expenditures in all fields.

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 FY2007 – FY2011



Total R&D Expenditures by Source of Funds FY2011 UMASS System



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

R&D Expenditures by Source

FY2005-FY2009										FY2010-FY2011			
	Total R&D Expenditures (S&E)									Total R&D Expenditures			
	FY05	FY06	FY07	FY08	FY09	5-Year Change FY05 - FY09		1-Year Change FY08 - FY09		FY10	FY11	1-Year Change FY10 - FY11	
						\$	%	\$	%			\$	%
Amherst	\$127,487	\$136,057	\$141,351	\$152,884	\$156,216	\$28,729	22.5%	\$3,332	2.2%	\$169,141	\$181,297	\$12,156	7.2%
Boston	\$18,148	\$21,056	\$25,952	\$30,272	\$36,637	\$18,489	101.9%	\$6,365	21.0%	\$56,416	\$57,040	\$624	1.1%
Dartmouth	\$19,452	\$19,171	\$19,538	\$20,431	\$19,343	-\$109	-0.6%	-\$1,088	-5.3%	\$25,725	\$25,644	-\$81	-0.3%
Lowell	\$23,852	\$27,635	\$34,824	\$36,486	\$52,431	\$28,579	119.8%	\$15,945	43.7%	\$59,345	\$60,013	\$668	1.1%
Worcester	\$149,267	\$156,452	\$157,469	\$178,614	\$204,033	\$54,766	36.7%	\$25,419	14.2%	\$232,039	\$262,714	\$30,675	13.2%
System	\$338,206	\$360,371	\$379,134	\$418,687	\$468,660	\$130,454	38.6%	\$49,973	11.9%	\$542,668	\$586,708	\$44,040	8.1%
	Federal R&D Expenditures (S&E)									Federal Total R&D Expenditures			
	FY05	FY06	FY07	FY08	FY09	5-Year Change FY05 - FY09		1-Year Change FY08 - FY09		FY10	FY11	1-Year Change FY10 - FY11	
						\$	%	\$	%			\$	%
Amherst	\$66,921	\$69,642	\$71,974	\$79,736	\$80,163	\$13,242	19.8%	\$427	0.5%	\$97,937	\$107,683	\$9,746	10.0%
Boston	\$6,326	\$8,610	\$9,152	\$12,001	\$13,536	\$7,210	114.0%	\$1,535	12.8%	\$24,527	\$26,958	\$2,431	9.9%
Dartmouth	\$9,852	\$9,515	\$11,456	\$13,087	\$9,667	-\$185	-1.9%	-\$3,420	-26.1%	\$12,236	\$13,657	\$1,421	11.6%
Lowell	\$17,608	\$18,741	\$20,045	\$22,406	\$23,083	\$5,475	31.1%	\$677	3.0%	\$25,550	\$27,960	\$2,410	9.4%
Worcester	\$130,680	\$136,141	\$131,226	\$145,113	\$145,834	\$15,154	11.6%	\$721	0.5%	\$178,293	\$208,244	\$29,951	16.8%
System	\$231,387	\$242,649	\$243,853	\$272,343	\$272,283	\$40,896	17.7%	-\$60	0.0%	\$338,543	\$384,502	\$45,959	13.6%
	State & Local Government R&D Expenditures (S&E)									State & Local Total R&D Expenditures			
	FY05	FY06	FY07	FY08	FY09	5-Year Change FY05 - FY09		1-Year Change FY08 - FY09		FY10	FY11	1-Year Change FY10 - FY11	
						\$	%	\$	%			\$	%
Amherst	\$3,873	\$5,684	\$5,638	\$4,699	\$5,439	\$1,566	40.4%	\$740	15.7%	\$4,567	\$3,166	-\$1,401	-30.7%
Boston	\$2,481	\$1,662	\$1,207	\$701	\$949	-\$1,532	-61.7%	\$248	35.4%	\$3,652	\$2,417	-\$1,235	-33.8%
Dartmouth	\$5,039	\$5,069	\$2,210	\$1,641	\$1,312	-\$3,727	-74.0%	-\$329	-20.0%	\$657	\$821	\$164	25.0%
Lowell	\$180	\$601	\$969	\$1,088	\$1,466	\$1,286	714.4%	\$378	34.7%	\$1,910	\$1,745	-\$165	-8.6%
Worcester	\$139	\$35	\$0	\$895	\$5,265	\$5,126	3687.8%	\$4,370	488.3%	\$1,506	\$1,290	-\$216	-14.3%
System	\$11,712	\$13,051	\$10,024	\$9,024	\$14,431	\$2,719	23.2%	\$5,407	59.9%	\$12,292	\$9,439	-\$2,853	-23.2%

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. For reference purposes, historical data FY2005-FY2009 will be maintained until the next 5-year trend data is complete. Note 2: UMA FY2010 figures have been revised since the FY2010 R&D Report publication.

R&D Expenditures by Source (Cont'd)

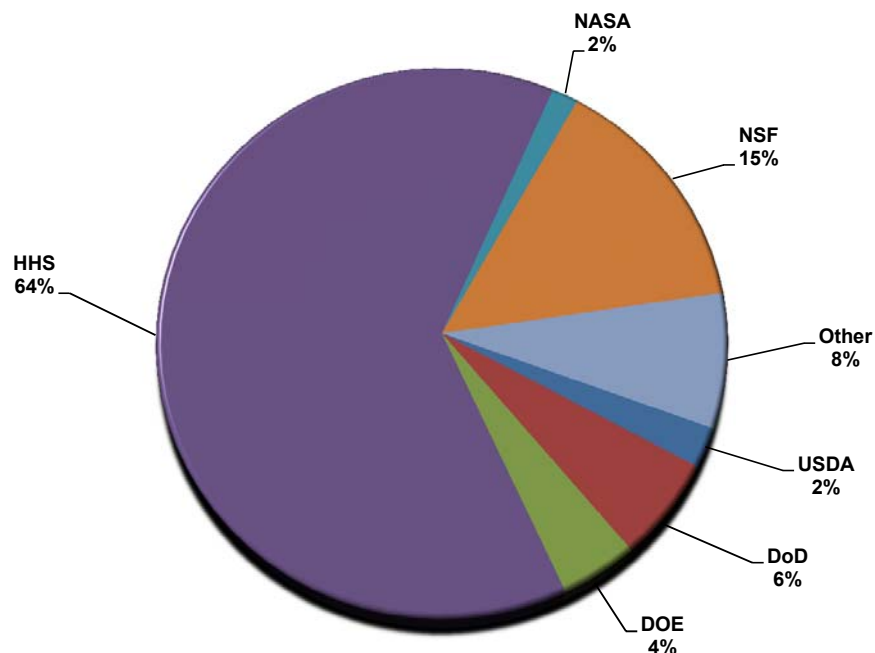
FY2005-FY2009											FY2010 - FY2011							
Industry-Sponsored R&D Expenditures (S&E)											Industry-Sponsored Total R&D Expenditures							
	FY05	FY06	FY07	FY08	FY09	5-Year Change FY05 - FY09		1-Year Change FY08 - FY09		FY10			FY11			1-Year Change FY10 - FY11		
										Business	Non-Profits	Total	Business	Non-Profits	Total			
						\$	%	\$	%	\$		\$		\$	%			
Amherst	\$4,724	\$5,934	\$5,195	\$8,182	\$8,505	\$3,781	80.0%	\$323	3.9%	\$6,234	\$6,675	\$12,909	\$6,048	\$6,476	\$12,524	-\$385	-3.0%	
Boston	\$0	\$0	\$275	\$552	\$333	\$333	NA	-\$219	-39.7%	\$91	\$5,902	\$5,993	\$188	\$4,933	\$5,121	-\$872	-14.6%	
Dartmouth	\$1,252	\$1,680	\$762	\$807	\$816	-\$436	-34.8%	\$9	1.1%	\$633	\$392	\$1,025	\$503	\$301	\$804	-\$221	-21.6%	
Lowell	\$4,755	\$4,423	\$5,222	\$6,299	\$6,772	\$2,017	42.4%	\$473	7.5%	\$4,460	\$1,779	\$6,239	\$3,726	\$2,426	\$6,152	-\$87	-1.4%	
Worcester	\$8,018	\$9,465	\$16,266	\$15,192	\$14,090	\$6,072	75.7%	-\$1,102	-7.3%	\$14,198	\$14,524	\$28,722	\$11,747	\$15,747	\$27,494	-\$1,228	-4.3%	
System	\$18,749	\$21,502	\$27,720	\$31,032	\$30,516	\$11,767	62.8%	-\$516	-1.7%	\$25,616	\$29,272	\$58,703	\$22,212	\$29,883	\$52,095	-\$6,608	-11.3%	
Institutional R&D Expenditures (S&E)											Institutional Total R&D Expenditures							
	FY05	FY06	FY07	FY08	FY09	5-Year Change FY05 - FY09		1-Year Change FY08 - FY09		FY10	FY11	1-Year Change FY10 - FY11						
						\$	%	\$	%			\$	%					
Amherst	\$42,887	\$45,773	\$48,755	\$49,556	\$50,647	\$7,760	18.1%	\$1,091	2.2%	\$52,426	\$57,156	\$4,730	9.0%					
Boston	\$6,731	\$7,007	\$11,122	\$13,048	\$15,993	\$9,262	137.6%	\$2,945	22.6%	\$21,997	\$22,350	\$353	1.6%					
Dartmouth	\$3,305	\$2,907	\$4,855	\$4,253	\$7,164	\$3,859	116.8%	\$2,911	68.4%	\$11,807	\$10,123	-\$1,684	-14.3%					
Lowell	\$1,309	\$3,870	\$8,588	\$6,693	\$21,110	\$19,801	1512.7%	\$14,417	215.4%	\$25,583	\$24,131	-\$1,452	-5.7%					
Worcester	\$1,583	\$2,377	\$1,385	\$2,626	\$20,916	\$19,333	1221.3%	\$18,290	696.5%	\$23,518	\$25,686	\$2,168	9.2%					
System	\$55,815	\$61,934	\$74,705	\$76,176	\$115,830	\$60,015	107.5%	\$39,654	52.1%	\$135,331	\$139,446	\$4,115	3.0%					
Other R&D Expenditures (S&E)											Other Total R&D Expenditures							
	FY05	FY06	FY07	FY08	FY09	5-Year Change FY05 - FY09		1-Year Change FY08 - FY09		FY10	FY11	1-Year Change FY10 - FY11						
						\$	%	\$	%			\$	%					
Amherst	\$9,082	\$9,024	\$9,789	\$10,711	\$11,462	\$2,380	26.2%	\$751	7.0%	\$1,302	\$768	-\$534	-41.0%					
Boston	\$2,610	\$3,777	\$4,196	\$3,970	\$5,826	\$3,216	123.2%	\$1,856	46.8%	\$247	\$194	-\$53	-21.5%					
Dartmouth	\$4	\$0	\$255	\$643	\$384	\$380	9500.0%	-\$259	-40.3%	\$0	\$239	\$239	0.0%					
Lowell	\$0	\$0	\$0	\$0	\$0	\$0	NA	\$0	NA	\$63	\$25	-\$38	-60.3%					
Worcester	\$8,847	\$8,434	\$8,592	\$14,788	\$17,928	\$9,081	102.6%	\$3,140	21.2%	\$0	\$0	\$0	0.0%					
System	\$20,543	\$21,235	\$22,832	\$30,112	\$35,600	\$15,057	73.3%	\$5,488	18.2%	\$1,612	\$1,226	-\$386	-23.9%					

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. For reference purposes, historical data FY2005-FY2009 will be maintained until the next 5-year trend data is complete.

Note 2: UMA FY2010 figures have been revised since the FY2010 R&D Report Publication.

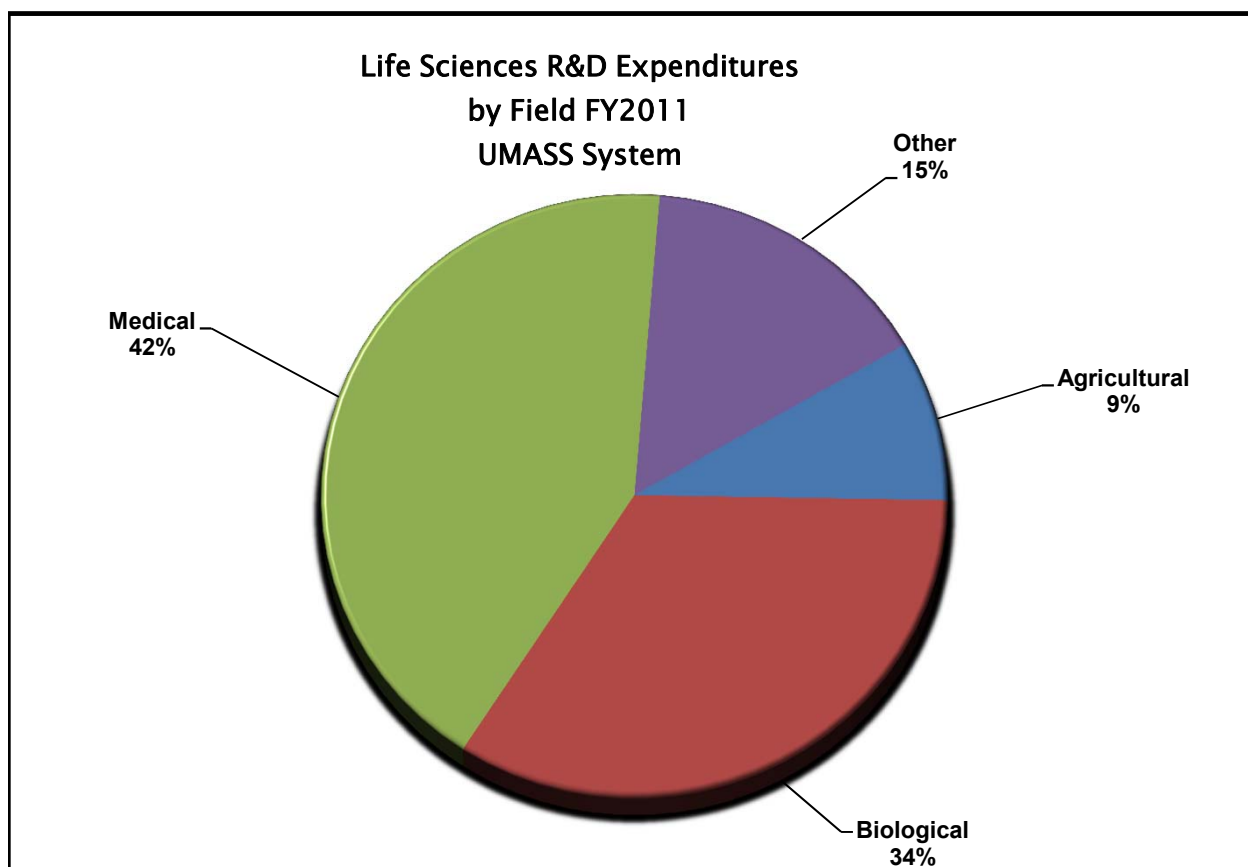
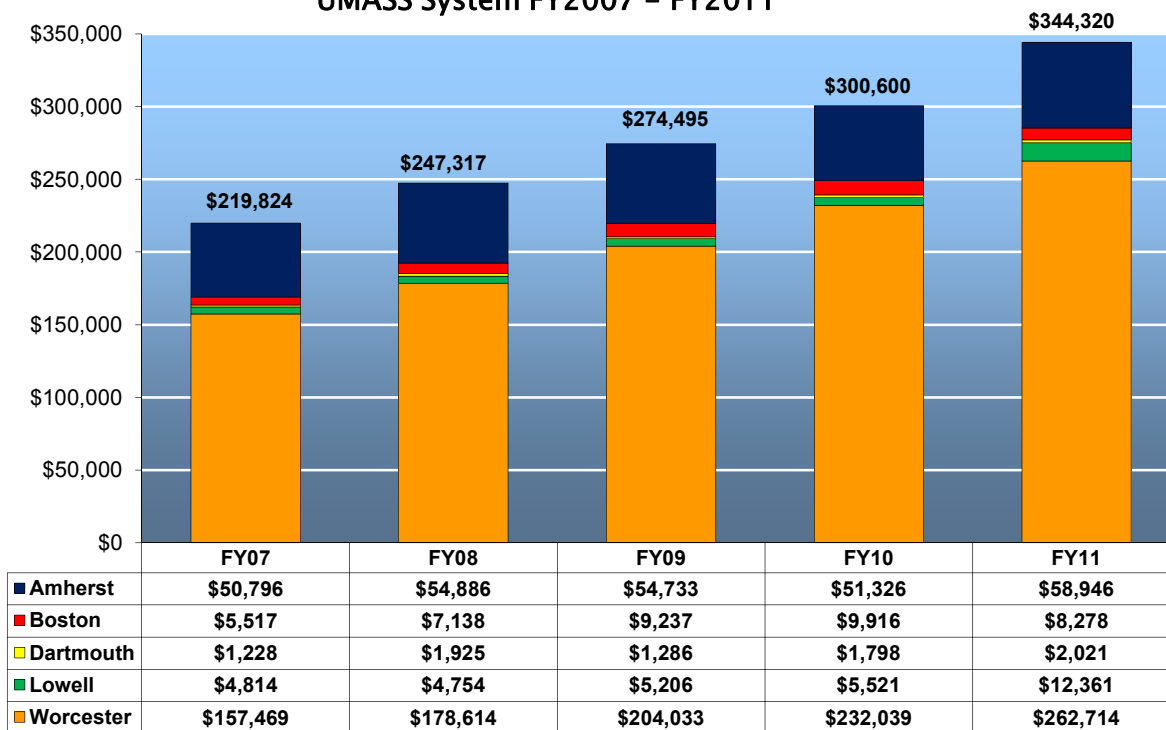
**Total R&D Expenditures
by Federal Government Agency Sources FY2011
UMASS System**



	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	\$ 107,683	\$ 8,074	7.5%	\$ 9,440	8.8%	\$ 13,654	12.7%	\$ 22,583	21.0%	\$ 3,407	3.2%	\$ 42,407	39.4%	\$ 8,118	7.5%
Boston	\$ 26,958	\$ -	0.0%	\$ 714	2.6%	\$ 559	2.1%	\$ 8,954	33.2%	\$ 2,023	7.5%	\$ 3,840	14.2%	\$ 10,868	40.3%
Dartmouth	\$ 13,657	\$ 546	4.0%	\$ 1,565	11.5%	\$ 986	7.2%	\$ 720	5.3%	\$ 55	0.4%	\$ 3,084	22.6%	\$ 6,701	49.1%
Lowell	\$ 27,960	\$ 219	0.8%	\$ 9,970	35.7%	\$ 1,200	4.3%	\$ 6,799	24.3%	\$ 370	1.3%	\$ 5,875	21.0%	\$ 3,527	12.6%
Worcester	\$ 208,244	\$ 225	0.1%	\$ 1,176	0.6%	\$ -	0.0%	\$ 204,931	98.4%	\$ 83	0.0%	\$ 540	0.3%	\$ 1,289	0.6%
System	\$ 384,502	\$ 9,064	2.4%	\$ 22,865	5.9%	\$ 16,399	4.3%	\$ 243,987	63.5%	\$ 5,938	1.5%	\$ 55,746	14.5%	\$ 30,503	7.9%

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

Life Sciences R&D Expenditures UMASS System FY2007 – FY2011



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

Note: UMA FY2010 figures have been revised since the FY2010 R&D Report Publication.

**Life Sciences R&D Expenditures by Field
FY2007 – FY2011**

	Life Sciences R&D Expenditures								
	FY07	FY08	FY09	FY10	FY11	5-Year Change FY07 - FY11		1-Year Change FY10 - FY11	
						\$	%	\$	%
Amherst	\$50,796	\$54,886	\$54,733	\$51,326	\$58,946	\$8,150	16.0%	\$7,620	14.8%
Boston	\$5,517	\$7,138	\$9,237	\$9,916	\$8,278	\$2,761	50.0%	-\$1,638	-16.5%
Dartmouth	\$1,228	\$1,925	\$1,286	\$1,798	\$2,021	\$793	64.6%	\$223	12.4%
Lowell	\$4,814	\$4,754	\$5,206	\$5,521	\$12,361	\$7,547	156.8%	\$6,840	123.9%
Worcester	\$157,469	\$178,614	\$204,033	\$232,039	\$262,714	\$105,245	66.8%	\$30,675	13.2%
System	\$219,824	\$247,317	\$274,495	\$300,600	\$344,320	\$124,496	56.6%	\$43,720	14.5%

	Agricultural								
	FY07	FY08	FY09	FY10	FY11	5-Year Change FY07 - FY11		1-Year Change FY10 - FY11	
						\$	%	\$	%
Amherst	\$20,795	\$24,478	\$23,088	\$21,708	\$28,669	\$7,874	37.9%	\$6,961	32.1%
Boston	\$0	\$0	\$0	\$0	\$0	\$0	0.0%	\$0	0.0%
Dartmouth	\$739	\$602	\$531	\$645	\$946	\$207	28.0%	\$301	46.7%
Lowell	\$0	\$0	\$0	\$0	\$0	\$0	0.0%	\$0	0.0%
Worcester	\$0	\$0	\$0	\$0	\$0	\$0	0.0%	\$0	0.0%
System	\$21,534	\$25,080	\$23,619	\$22,353	\$29,615	\$8,081	37.5%	\$7,262	32.5%

	Biological								
	FY07	FY08	FY09	FY10	FY11	5-Year Change FY07 - FY11		1-Year Change FY10 - FY11	
						\$	%	\$	%
Amherst	\$22,757	\$22,823	\$23,323	\$22,494	\$23,276	\$519	2.3%	\$782	3.5%
Boston	\$2,345	\$3,384	\$3,020	\$2,537	\$2,581	\$236	10.1%	\$44	1.7%
Dartmouth	\$465	\$970	\$711	\$1,120	\$1,004	\$539	115.9%	-\$116	-10.4%
Lowell	\$1,378	\$1,477	\$1,531	\$1,281	\$1,553	\$175	12.7%	\$272	21.2%
Worcester	\$56,562	\$63,980	\$72,851	\$77,718	\$88,359	\$31,797	56.2%	\$10,641	13.7%
System	\$83,507	\$92,634	\$101,436	\$105,150	\$116,773	\$33,266	39.8%	\$11,623	11.1%

Note: UMA FY2010 figures have been revised since the FY2010 R&D Report Publication.

**Life Sciences R&D Expenditures by Field
FY2007 – FY2011**

	Medical								
	FY07	FY08	FY09	FY10	FY11	5-Year Change FY07 - FY11		1-Year Change FY10 - FY11	
						\$	%	\$	%
Amherst	\$5,401	\$6,575	\$7,237	\$6,411	\$6,473	\$1,072	19.8%	\$62	1.0%
Boston	\$2,984	\$2,934	\$3,493	\$4,697	\$4,675	\$1,691	56.7%	-\$22	-0.5%
Dartmouth	\$0	\$0	\$0	\$0	\$0	\$0	0.0%	\$0	0.0%
Lowell	\$0	\$0	\$0	\$0	\$252	\$252	0.0%	\$252	0.0%
Worcester	\$82,470	\$93,501	\$104,417	\$124,323	\$133,598	\$51,128	62.0%	\$9,275	7.5%
System	\$90,855	\$103,010	\$115,147	\$135,431	\$144,998	\$54,143	59.6%	\$9,567	7.1%

	Other Life Sciences								
	FY07	FY08	FY09	FY10	FY11	5-Year Change FY07 - FY11		1-Year Change FY10 - FY11	
						\$	%	\$	%
Amherst	\$1,843	\$1,010	\$1,085	\$713	\$528	-\$1,315	-71.4%	-\$185	-25.9%
Boston	\$188	\$820	\$2,724	\$2,682	\$1,022	\$834	443.6%	-\$1,660	-61.9%
Dartmouth	\$24	\$353	\$44	\$33	\$71	\$47	195.8%	\$38	115.2%
Lowell	\$3,436	\$3,277	\$3,675	\$4,240	\$10,556	\$7,120	207.2%	\$6,316	149.0%
Worcester	\$18,437	\$21,133	\$26,765	\$ 29,998	\$ 40,757	\$ 22,320	121.1%	\$10,759	35.9%
System	\$23,928	\$26,593	\$34,293	\$ 37,666	\$52,934	\$29,006	121.2%	\$15,268	40.5%

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

Note: UMA FY2010 figures have been revised since the FY2010 R&D Report Publication.

EPILOGUE

The *FY2011 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 FY2010 SURVEY

The Higher Education Research and Development Survey for FY2011, formerly the Survey of Research and Development Expenditures at Universities and Colleges, has experienced several changes from its previous version. NSF outlines these changes as follows:

1. NSF has clarified the definition of R&D expenditures inclusion criteria to add that all expenditures from operating fund accounts dedicated to research should be included.
2. Similarly, there was an addition to the R&D expenditures exclusion criteria to add that unrecovered indirect costs above the institution's negotiated rate should not be included in reported totals.
3. **Changes to Questions**
 - Question 1. Row e1, Institutionally financed research, has been clarified to include all R&D funded by the institution from accounts that are only used for research.
 - Questions 7 and 8. The types of entities have been expanded to include Higher education institutions, Business, Nonprofit organizations, and Other. If the institution cannot easily break out expenditures for these new categories this year, it may report using just the higher education and other categories as in prior years.

Source: National Science Foundation Higher Education Research And Development Survey, FY2011.

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 FY2010 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.

f. 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 FY2011 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.

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