



National Center for Science and
Engineering Statistics

FFRDC Research and Development Expenditures: Fiscal Year 2022

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General Notes

The FFRDC Research and Development Survey is the primary source of information on R&D expenditures that are separately accounted for at federally funded research and development centers (FFRDCs) in the United States. Conducted annually for university-administered FFRDCs since FY 1953 and all FFRDCs since FY 2001, the survey collects information on R&D expenditures by source of funds and types of research and expenses. The survey is an annual census of the full population of eligible FFRDCs. See <https://www.nsf.gov/statistics/ffrdclist/> for the Master Government List of FFRDCs.

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Federally funded research and development center (FFRDC) expenditures

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TABLE 1

R&D expenditures at federally funded research and development centers, by source of funds: FYs 2001–22

(Dollars in thousands)

Fiscal year	All R&D expenditures	Federal government	State and local government	Business	Nonprofit organizations	All other sources ^a
2001	10,071,307	9,709,221	19,389	144,043	na	198,654
2002	11,536,424	11,095,110	31,423	134,251	na	275,640
2003	12,126,880	11,681,318	33,301	138,685	na	273,576
2004	12,632,207	12,321,652	29,959	119,843	na	160,753
2005	13,254,522	12,917,206	32,339	129,036	na	175,941
2006	13,218,497	12,824,552	30,122	170,879	na	192,944
2007	13,824,987	13,401,081	32,072	172,592	na	219,242
2008	15,616,390	15,177,347	32,188	202,534	na	204,321
2009	16,390,111	15,942,851	35,442	189,721	na	222,097
2010	18,880,609	18,453,552	52,871	168,561	23,665	181,960
2011	18,671,245	18,276,088	26,744	190,111	38,878	139,424
2012	18,280,943	17,875,012	39,428	184,434	45,926	136,143
2013	17,667,184	17,284,513	50,449	186,911	39,390	105,921
2014	17,718,556	17,331,396	28,337	220,735	37,182	100,906
2015	18,458,257	18,097,189	18,427	208,780	27,984	105,877
2016	19,219,702	18,855,593	21,556	192,239	40,195	110,119
2017	20,038,307	19,667,804	29,029	192,107	46,526	102,841
2018	21,171,529	20,770,388	43,458	197,975	43,630	116,078
2019	22,737,500	22,338,855	51,167	180,583	48,238	118,657
2020	23,514,241	23,133,501	43,995	172,866	47,056	116,823
2021	24,921,476	24,509,691	43,774	195,954	49,016	123,041
2022	26,524,014	25,962,005	38,591	367,712	49,120	106,586

na = not applicable; data from nonprofit organizations were not collected separately.

^a Prior to FY 2010, R&D expenditures from nonprofit organizations were collected under All other sources.**Source(s):**

National Center for Science and Engineering Statistics, FFRDC Research and Development Survey.

TABLE 2

Total and federally financed R&D expenditures at federally funded research and development centers, by type of R&D: FYs 2001–22

(Dollars in millions and percent)

Fiscal year	Total								Federally financed							
	All R&D expenditures	Basic research		Applied research		Experimental development		All R&D expenditures	Basic research		Applied research		Experimental development			
		Amount	Percent	Amount	Percent	Amount	Percent		Amount	Percent	Amount	Percent	Amount	Percent		
2001	10,071	3,875	38.5	na	na	na	na	9,709	3,726	38.4	na	na	na	na		
2002	11,536	4,744	41.1	na	na	na	na	11,095	4,523	40.8	na	na	na	na		
2003	12,127	5,122	42.2	na	na	na	na	11,681	4,880	41.8	na	na	na	na		
2004	12,632	4,931	39.0	na	na	na	na	12,322	4,790	38.9	na	na	na	na		
2005	13,255	5,110	38.5	na	na	na	na	12,917	4,977	38.5	na	na	na	na		
2006	13,218	5,197	39.3	na	na	na	na	12,825	5,048	39.4	na	na	na	na		
2007 ^a	13,825	5,296	38.3	3,479	25.2	4,411	31.9	13,401	5,151	38.4	3,314	24.7	4,319	32.2		
2008	15,616	5,379	34.4	3,992	25.6	6,245	40.0	15,177	5,210	34.3	3,825	25.2	6,143	40.5		
2009	16,390	5,871	35.8	4,545	27.7	5,974	36.4	15,943	5,714	35.8	4,346	27.3	5,884	36.9		
2010	18,881	6,655	35.2	5,191	27.5	7,034	37.3	18,454	6,487	35.2	5,031	27.3	6,935	37.6		
2011	18,671	6,582	35.3	5,175	27.7	6,914	37.0	18,276	6,439	35.2	5,006	27.4	6,830	37.4		
2012	18,281	6,153	33.7	5,382	29.4	6,746	36.9	17,875	6,013	33.6	5,209	29.1	6,653	37.2		
2013	17,667	4,186	23.7	6,818	38.6	6,663	37.7	17,285	4,081	23.6	6,636	38.4	6,568	38.0		
2014	17,719	4,195	23.7	6,839	38.6	6,684	37.7	17,331	4,098	23.6	6,648	38.4	6,585	38.0		
2015	18,458	4,094	22.2	7,292	39.5	7,072	38.3	18,097	4,012	22.2	7,118	39.3	6,968	38.5		
2016	19,220	4,224	22.0	7,527	39.2	7,468	38.9	18,856	4,136	21.9	7,373	39.1	7,347	39.0		
2017	20,038	4,111	20.5	7,931	39.6	7,996	39.9	19,668	4,039	20.5	7,756	39.4	7,873	40.0		
2018	21,172	4,180	19.7	8,391	39.6	8,600	40.6	20,770	4,099	19.7	8,205	39.5	8,466	40.8		
2019	22,738	4,536	19.9	9,200	40.5	9,002	39.6	22,339	4,455	19.9	9,014	40.4	8,869	39.7		
2020	23,514	4,712	20.0	9,433	40.1	9,369	39.8	23,134	4,637	20.0	9,257	40.0	9,239	39.9		
2021	24,921	5,021	20.1	9,951	39.9	9,949	39.9	24,510	4,945	20.2	9,765	39.8	9,799	40.0		
2022	26,524	5,273	19.9	10,839	40.9	10,412	39.3	25,962	5,188	20.0	10,510	40.5	10,264	39.5		

na = not applicable; separate data for applied research and experimental development were not collected before FY 2007.

^a FY 2007 detail does not add to total because one institution was unable to provide a breakout of applied research and experimental development expenditures.**Note(s):**

Because of rounding, detail may not add to total.

Source(s):

National Center for Science and Engineering Statistics, FFRDC Research and Development Survey.

TABLE 3

Federally financed R&D expenditures from federal agencies: FY 2022

(Dollars in thousands)

Federal agency	R&D expenditures
All federal agencies	25,962,005
Administrative Office of the U.S. Courts	532
Agency for International Development	15,938
Architect of the Capitol	272
Central Intelligence Agency	2,145
Consumer Product Safety Commission	346
Department of Agriculture	4,639
Department of Commerce	77,958
Department of Defense	5,407,751
Department of Energy	14,479,448
Department of Health and Human Services	1,279,292
Department of Homeland Security	610,137
Department of Justice	24,627
Department of State	51,329
Department of the Interior	14,397
Department of the Treasury	148,412
Department of Transportation	209,850
Department of Veterans Affairs	107,063
Environmental Protection Agency	6,108
Executive Office of the President	1,270
Federal Deposit Insurance Corporation	108
General Services Administration	956
National Aeronautics and Space Administration	2,661,826
National Credit Union Administration	253
National Science Foundation	345,218
Nuclear Regulatory Commission	38,089
Office of the Director of National Intelligence	8,609
U.S. Postal Service	50
Other agencies not listed ^a	465,382

^a Some funding sources were not identified for security reasons or because the original source was not known.

Source(s):

National Center for Science and Engineering Statistics, FFRDC Research and Development Survey, FY 2022.

TABLE 4

R&D expenditures at federally funded research and development centers, by source of funds and FFRDC: FY 2022

(Dollars in thousands)

FFRDC	All R&D expenditures	Federal government	State and local government	Business	Nonprofit organizations	All other sources
All FFRDCs	26,524,014	25,962,005	38,591	367,712	49,120	106,586
University-administered FFRDCs	7,165,067	7,015,547	16,502	65,210	19,726	48,082
Ames Laboratory	38,520	38,032	146	337	0	5
Argonne National Laboratory	962,973	934,724	1,129	20,725	326	6,069
Fermi National Accelerator Laboratory	330,294	329,131	0	489	205	469
Green Bank Observatory	10,752	10,384	0	29	210	129
Jet Propulsion Laboratory	2,417,556	2,417,556	0	0	0	0
Lawrence Berkeley National Laboratory	1,031,716	971,554	11,074	23,723	7,458	17,907
Lincoln Laboratory	1,142,615	1,119,338	51	7,673	1,211	14,342
National Center for Atmospheric Research	188,238	171,310	1,398	6,956	8,566	8
National Radio Astronomy Observatory	92,476	91,913	0	307	174	82
National Solar Observatory	33,849	33,800	0	0	0	49
NSF's National Optical-Infrared Astronomy Research Laboratory (NSF's NOIRLab)	81,505	79,193	0	0	0	2,312
Princeton Plasma Physics Laboratory	120,347	119,828	0	372	0	147
SLAC National Accelerator Laboratory	432,078	419,094	825	4,096	1,563	6,500
Software Engineering Institute	129,316	129,316	0	0	0	0
Thomas Jefferson National Accelerator Facility	152,832	150,374	1,879	503	13	63
Nonprofit-administered FFRDCs	9,171,826	8,998,910	21,734	90,827	28,847	31,508
Aerospace Federally Funded Research and Development Center	1,152,833	1,147,041	0	4,707	0	1,085
Arroyo Center	40,856	40,856	0	0	0	0
Brookhaven National Laboratory	655,988	639,527	7,369	6,264	140	2,688
Center for Advanced Aviation System Development	189,490	164,992	866	5,382	1,966	16,284
Center for Communications and Computing	74,759	74,759	0	0	0	0
Center for Enterprise Modernization	235,436	235,317	0	0	119	0
Center for Naval Analyses	93,567	93,567	0	0	0	0
Center for Nuclear Waste Regulatory Analyses	4,323	3,595	15	295	0	418
CMS Alliance to Modernize Healthcare	286,693	286,693	0	0	0	0
Homeland Security Operational Analysis Center	52,984	52,984	0	0	0	0
Homeland Security Systems Engineering and Development Institute	183,261	181,702	823	516	75	145
Idaho National Laboratory	637,579	630,446	388	5,803	195	747
National Biodefense Analysis and Countermeasures Center	45,870	45,869	0	0	1	0
National Cybersecurity Center of Excellence	27,955	27,955	0	0	0	0
National Defense Research Institute	61,097	61,097	0	0	0	0
National Renewable Energy Laboratory	603,356	536,683	3,278	46,963	16,432	0
National Security Engineering Center	1,286,520	1,282,762	0	423	519	2,816
Oak Ridge National Laboratory	1,803,543	1,789,100	527	8,144	1,714	4,058
Pacific Northwest National Laboratory	1,294,614	1,266,328	8,468	9,524	7,686	2,608
Project Air Force	46,517	46,517	0	0	0	0
Savannah River National Laboratory	182,654	179,848	0	2,806	0	0
Science and Technology Policy Institute	10,593	10,593	0	0	0	0
Systems and Analyses Center	201,338	200,679	0	0	0	659
Industry-administered FFRDCs	10,187,121	9,947,548	355	211,675	547	26,996
Frederick National Laboratory for Cancer Research	904,182	904,182	0	0	0	0
Lawrence Livermore National Laboratory	1,659,808	1,633,185	187	11,498	547	14,391
Los Alamos National Laboratory	3,811,602	3,629,955	0	181,647	0	0
Sandia National Laboratories	3,811,529	3,780,226	168	18,530	0	12,605

FFRDC = federally funded research and development center; NSF = National Science Foundation.

Source(s):

National Center for Science and Engineering Statistics, FFRDC Research and Development Survey, FY 2022.

TABLE 5

Federally financed R&D expenditures at federally funded research and development centers, by federal agency and FFRDC: FY 2022

(Dollars in thousands)

FFRDC	All federal R&D expenditures	DOD	DOE	HHS	DHS	DOT	NASA	NSF	Other
All FFRDCs	25,962,005	5,407,751	14,479,448	1,279,292	610,137	209,850	2,661,826	345,218	968,483
University-administered FFRDCs	7,015,547	1,160,040	2,840,006	39,594	79,188	35,427	2,460,192	338,588	62,512
Ames Laboratory	38,032	0	38,032	0	0	0	0	0	0
Argonne National Laboratory	934,724	28,240	854,246	6,148	23,701	5,476	421	224	16,268
Fermi National Accelerator Laboratory	329,131	0	329,131	0	0	0	0	0	0
Green Bank Observatory	10,384	0	0	0	0	0	14	10,370	0
Jet Propulsion Laboratory	2,417,556	0	0	0	0	0	2,417,556	0	0
Lawrence Berkeley National Laboratory	971,554	11,871	930,980	21,589	1,436	899	3,888	0	891
Lincoln Laboratory	1,119,338	1,027,000	6,870	2,654	18,808	24,478	20,563	0	18,965
National Center for Atmospheric Research	171,310	3,918	2,981	0	0	4,310	14,704	127,181	18,216
National Radio Astronomy Observatory	91,913	407	0	0	0	0	168	91,338	0
National Solar Observatory	33,800	46	0	0	0	0	868	32,886	0
NSF's National Optical-Infrared Astronomy Research Laboratory (NSF's NOIRLab)	79,193	79	3,684	0	0	0	400	75,030	0
Princeton Plasma Physics Laboratory	119,828	137	118,758	0	0	0	862	71	0
SLAC National Accelerator Laboratory	419,094	3,822	403,644	7,753	920	0	748	1,488	719
Software Engineering Institute	129,316	84,520	1,306	1,450	34,323	264	0	0	7,453
Thomas Jefferson National Accelerator Facility	150,374	0	150,374	0	0	0	0	0	0
Nonprofit-administered FFRDCs	8,998,910	2,949,887	4,285,051	322,251	437,387	173,138	130,648	6,630	693,918
Aerospace Federally Funded Research and Development Center	1,147,041	1,003,373	20,974	0	612	3,697	85,201	163	33,021
Arroyo Center	40,856	40,856	0	0	0	0	0	0	0
Brookhaven National Laboratory	639,527	1,184	610,346	3,092	1,459	0	8,783	0	14,663
Center for Advanced Aviation System Development	164,992	0	0	0	0	164,750	242	0	0
Center for Communications and Computing	74,759	74,759	0	0	0	0	0	0	0
Center for Enterprise Modernization	235,317	0	17	0	0	0	885	0	234,415

TABLE 5

Federally financed R&D expenditures at federally funded research and development centers, by federal agency and FFRDC: FY 2022

(Dollars in thousands)

FFRDC	All federal R&D expenditures	DOD	DOE	HHS	DHS	DOT	NASA	NSF	Other
Center for Naval Analyses	93,567	93,567	0	0	0	0	0	0	0
Center for Nuclear Waste Regulatory Analyses	3,595	36	138	0	0	102	0	0	3,319
CMS Alliance to Modernize Healthcare	286,693	0	0	286,693	0	0	0	0	0
Homeland Security Operational Analysis Center	52,984	0	0	0	52,456	0	0	0	528
Homeland Security Systems Engineering and Development Institute	181,702	0	0	0	179,618	0	0	0	2,084
Idaho National Laboratory	630,446	96,483	449,996	0	62,565	835	4,606	0	15,961
National Biodefense Analysis and Countermeasures Center	45,869	1,119	0	1,119	29,510	0	0	0	14,121
National Cybersecurity Center of Excellence	27,955	0	0	0	0	0	0	0	27,955
National Defense Research Institute	61,097	59,151	0	0	0	212	0	0	1,734
National Renewable Energy Laboratory	536,683	11,882	505,161	145	4,652	780	953	0	13,110
National Security Engineering Center	1,282,762	1,091,302	0	0	0	0	0	0	191,460
Oak Ridge National Laboratory	1,789,100	54,508	1,574,496	6,379	11,040	2,762	27,561	244	112,110
Pacific Northwest National Laboratory	1,266,328	172,623	969,783	24,010	80,943	0	1,811	632	16,526
Project Air Force	46,517	46,517	0	0	0	0	0	0	0
Savannah River National Laboratory	179,848	23,503	151,107	0	2,108	0	0	0	3,130
Science and Technology Policy Institute	10,593	66	292	813	650	0	414	5,591	2,767
Systems and Analyses Center	200,679	178,958	2,741	0	11,774	0	192	0	7,014
Industry-administered FFRDCs	9,947,548	1,297,824	7,354,391	917,447	93,562	1,285	70,986	0	212,053
Frederick National Laboratory for Cancer Research	904,182	154	0	904,027	0	0	0	0	1
Lawrence Livermore National Laboratory	1,633,185	307,749	1,278,991	6,652	26,985	0	5,227	0	7,581
Los Alamos National Laboratory	3,629,955	73,607	3,395,021	5,056	3,843	0	64,508	0	87,920
Sandia National Laboratories	3,780,226	916,314	2,680,379	1,712	62,734	1,285	1,251	0	116,551

DHS = Department of Homeland Security; DOD = Department of Defense; DOE = Department of Energy; DOT = Department of Transportation; FFRDC = federally funded research and development center; HHS = Department of Health and Human Services; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation.

Source(s):

National Center for Science and Engineering Statistics, FFRDC Research and Development Survey, FY 2022.

TABLE 6

Total and federally financed R&D expenditures at federally funded research and development centers, by type of R&D and FFRDC: FY 2022

(Dollars in thousands)

FFRDC	Sponsor	Location	Total				Federally financed			
			All R&D expenditures	Basic research	Applied research	Experimental development	All R&D expenditures	Basic research	Applied research	Experimental development
All FFRDCs	-	-	26,524,014	5,273,184	10,839,112	10,411,718	25,962,005	5,187,725	10,509,907	10,264,373
University-administered FFRDCs	-	-	7,165,067	2,600,343	1,928,032	2,636,692	7,015,547	2,541,206	1,872,830	2,601,511
Ames Laboratory	DOE	Ames, IA	38,520	18,565	19,251	704	38,032	18,565	19,164	303
Argonne National Laboratory	DOE	Argonne, IL	962,973	184,625	432,551	345,797	934,724	184,625	406,940	343,159
Fermi National Accelerator Laboratory	DOE	Batavia, IL	330,294	329,134	1,160	0	329,131	328,318	813	0
Green Bank Observatory	NSF	Green Bank, WV	10,752	10,045	229	478	10,384	10,032	85	267
Jet Propulsion Laboratory	NASA	Pasadena, CA	2,417,556	241,756	241,756	1,934,044	2,417,556	241,756	241,756	1,934,044
Lawrence Berkeley National Laboratory	DOE	Berkeley, CA	1,031,716	863,154	139,904	28,658	971,554	821,346	125,981	24,227
Lincoln Laboratory	DOD, OSD	Lexington, MA	1,142,615	9,189	1,026,448	106,978	1,119,338	9,189	1,026,448	83,701
National Center for Atmospheric Research	NSF	Boulder, CO	188,238	52,487	33,476	102,275	171,310	48,355	24,406	98,549
National Radio Astronomy Observatory	NSF	Charlottesville, VA	92,476	84,768	327	7,381	91,913	84,767	230	6,916
National Solar Observatory	NSF	Boulder, CO	33,849	33,849	0	0	33,800	33,800	0	0
NSF's National Optical-Infrared Astronomy Research Laboratory (NSF's NOIRLab)	NSF	Tucson, AZ	81,505	81,505	0	0	79,193	79,193	0	0
Princeton Plasma Physics Laboratory	DOE	Princeton, NJ	120,347	119,315	1,000	32	119,828	118,840	988	0
SLAC National Accelerator Laboratory	DOE	Menlo Park, CA	432,078	411,454	20,624	0	419,094	404,381	14,713	0
Software Engineering Institute	DOD, OSD	Pittsburgh, PA	129,316	7,665	11,306	110,345	129,316	7,665	11,306	110,345
Thomas Jefferson National Accelerator Facility	DOE	Newport News, VA	152,832	152,832	0	0	150,374	150,374	0	0
Nonprofit-administered FFRDCs	-	-	9,171,826	1,813,356	2,860,956	4,497,514	8,998,910	1,806,701	2,782,288	4,409,921
Aerospace Federally Funded Research and Development Center	DOD, Air Force	El Segundo, CA	1,152,833	26,598	113,602	1,012,633	1,147,041	26,309	108,099	1,012,633
Arroyo Center	DOD, Army	Santa Monica, CA	40,856	0	40,856	0	40,856	0	40,856	0
Brookhaven National Laboratory	DOE	Upton, NY	655,988	487,906	93,114	74,968	639,527	487,169	89,556	62,802
Center for Advanced Aviation System Development	DOT, FAA	McLean, VA	189,490	0	8,037	181,453	164,992	0	6,906	158,086
Center for Communications and Computing	DOD, NSA/CSS	Alexandria, VA	74,759	18,690	37,379	18,690	74,759	18,690	37,379	18,690
Center for Enterprise Modernization	Treasury/IRS, VA, SSA, DOC	McLean, VA	235,436	0	12,539	222,897	235,317	0	12,532	222,785
Center for Naval Analyses	DOD, Navy	Arlington, VA	93,567	0	93,567	0	93,567	0	93,567	0
Center for Nuclear Waste Regulatory Analyses	NRC	San Antonio, TX	4,323	0	4,323	0	3,595	0	3,595	0
CMS Alliance to Modernize Healthcare	HHS, CMS	Baltimore, MD	286,693	0	6,498	280,195	286,693	0	6,498	280,195
Homeland Security Operational Analysis Center	DHS, S&T	Pentagon City, VA	52,984	0	52,984	0	52,984	0	52,984	0
Homeland Security Systems Engineering and Development Institute	DHS, S&T	McLean, VA	183,261	0	4,373	178,888	181,702	0	4,330	177,372
Idaho National Laboratory	DOE	Idaho Falls, ID	637,579	38,255	337,917	261,407	630,446	37,827	334,137	258,482
National Biodefense Analysis and Countermeasures Center	DHS, S&T	Frederick, MD	45,870	0	45,870	0	45,869	0	45,869	0
National Cybersecurity Center of Excellence	NIST	Rockville, MD	27,955	0	638	27,317	27,955	0	638	27,317
National Defense Research Institute	DOD, OSD	Santa Monica, CA	61,097	0	61,097	0	61,097	0	61,097	0

TABLE 6

Total and federally financed R&D expenditures at federally funded research and development centers, by type of R&D and FFRDC: FY 2022

(Dollars in thousands)

FFRDC	Sponsor	Location	Total				Federally financed			
			All R&D expenditures	Basic research	Applied research	Experimental development	All R&D expenditures	Basic research	Applied research	Experimental development
National Renewable Energy Laboratory	DOE	Golden, CO	603,356	53,668	335,179	214,509	536,683	53,668	295,176	187,839
National Security Engineering Center	DOD,OSD	Bedford, MA/ McLean, VA	1,286,520	0	77,841	1,208,679	1,282,762	0	77,627	1,205,135
Oak Ridge National Laboratory	DOE	Oak Ridge, TN	1,803,543	947,470	856,073	0	1,789,100	947,470	841,630	0
Pacific Northwest National Laboratory	DOE	Richland, WA	1,294,614	231,637	329,294	733,683	1,266,328	226,576	322,099	717,653
Project Air Force	DOD, Air Force	Santa Monica, CA	46,517	0	46,517	0	46,517	0	46,517	0
Savannah River National Laboratory	DOE	Aiken, SC	182,654	9,132	91,327	82,195	179,848	8,992	89,924	80,932
Science and Technology Policy Institute	NSF	Washington, DC	10,593	0	10,593	0	10,593	0	10,593	0
Systems and Analyses Center	DOD, OSD	Alexandria, VA	201,338	0	201,338	0	200,679	0	200,679	0
Industry-administered FFRDCs	-	-	10,187,121	859,485	6,050,124	3,277,512	9,947,548	839,818	5,854,789	3,252,941
Frederick National Laboratory for Cancer Research	HHS, NIH	Frederick, MD	904,182	182,039	417,884	304,259	904,182	182,039	417,884	304,259
Lawrence Livermore National Laboratory	DOE	Livermore, CA	1,659,808	107,902	1,194,957	356,949	1,633,185	102,767	1,173,469	356,949
Los Alamos National Laboratory	DOE	Los Alamos, NM	3,811,602	304,928	3,468,557	38,117	3,629,955	290,396	3,303,259	36,300
Sandia National Laboratories	DOE	Albuquerque, NM	3,811,529	264,616	968,726	2,578,187	3,780,226	264,616	960,177	2,555,433

CMS = Centers for Medicare and Medicaid Services; DHS = Department of Homeland Security; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; DOT = Department of Transportation; FAA = Federal Aviation Administration; FFRDC = federally funded research and development center; HHS = Department of Health and Human Services; IRS = Internal Revenue Service; NASA = National Aeronautics and Space Administration; NIH = National Institutes of Health; NIST = National Institute of Science and Technology; NRC = Nuclear Regulatory Commission; NSA/CSS = National Security Agency/Central Security Service; NSF = National Science Foundation; OSD = Office of the Secretary of Defense; S&T = Science and Technology Directorate; SSA = Social Security Administration; VA = Department of Veterans Affairs.

Source(s):

National Center for Science and Engineering Statistics, FFRDC Research and Development Survey, FY 2022.

TABLE 7

Total R&D expenditures at federally funded research and development centers, by FFRDC: FYs 2001-22

(Dollars in thousands)

FFRDC	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011 ^a	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
All FFRDCs	10,071,307	11,536,424	12,126,880	12,632,207	13,254,522	13,218,497	13,824,987	15,616,390	16,390,111	18,880,609	18,671,245	18,280,943	17,667,184	17,718,556	18,458,257	19,219,702	20,038,307	21,171,529	22,737,500	23,514,241	24,921,476	26,524,014
Aerospace Federally Funded Research and Development Center ^b	17,600	26,306	32,745	32,529	32,500	34,200	36,490	38,940	41,470	880,653	908,458	874,653	835,068	838,708	888,119	909,868	942,704	1,020,827	1,065,989	1,114,741	1,128,241	1,152,833
Ames Laboratory	22,916	23,416	25,213	27,227	29,293	26,460	25,254	27,306	29,012	30,836	32,442	33,853	34,234	41,824	45,845	46,886	53,527	36,858	33,612	32,844	34,214	38,520
Argonne National Laboratory	478,391	506,666	500,828	520,881	482,051	472,961	489,684	533,530	543,169	650,504	710,435	679,387	708,501	719,459	719,521	733,377	723,824	777,246	810,693	859,658	856,568	962,973
Arroyo Center	24,317	24,484	27,889	26,101	28,152	24,518	25,195	23,852	27,692	28,647	32,180	31,278	32,789	33,391	40,594	44,616	42,723	39,738	37,956	35,248	38,304	40,856
Brookhaven National Laboratory	454,500	454,482	452,728	450,342	483,039	490,686	510,212	480,455	569,240	535,546	526,571	516,921	529,634	573,364	587,194	579,087	556,875	552,640	590,470	595,466	637,658	655,988
Center for Advanced Aviation System Development	5,683	6,256	6,633	6,462	6,429	6,601	7,290	126,171	133,869	149,686	165,645	159,311	146,860	149,054	155,696	156,644	168,169	177,530	174,123	180,634	230,484	189,490
Center for Communications and Computing	43,100	45,296	45,960	50,238	50,800	51,500	57,400	59,500	66,293	71,927	72,600	62,600	51,477	63,199	56,478	61,625	66,692	68,237	68,371	67,072	65,255	74,759
Center for Enterprise Modernization	1,161	2,434	2,834	3,687	4,802	6,342	7,101	166,894	181,958	170,460	187,785	226,539	202,319	158,069	145,442	146,436	154,933	162,690	174,712	190,408	263,661	235,436
Center for Naval Analyses	69,102	72,712	75,869	79,087	83,837	87,499	99,993	106,967	109,694	109,068	85,165	91,628	86,132	80,283	80,358	84,232	90,401	95,198	96,697	95,874	96,391	93,567
Center for Nuclear Waste Regulatory Analyses	14,977	16,398	17,625	16,847	16,391	16,397	17,007	17,960	16,614	15,346	16,377	13,147	12,331	12,314	12,636	8,600	6,312	5,054	6,987	6,762	5,630	4,323
CMS Alliance to Modernize Healthcare	na	na	na	na	na	na	na	na	na	na	na	na	17,521	70,458	168,142	141,860	169,013	175,030	213,369	228,162	348,269	286,693
Fermi National Accelerator Laboratory	310,928	313,556	303,340	318,435	323,153	330,980	337,306	340,486	376,791	402,658	420,119	412,438	376,472	334,522	319,700	323,507	320,516	328,419	334,258	300,002	319,051	330,294
Frederick National Laboratory for Cancer Research	187,222	260,000	296,000	335,000	334,400	334,500	339,800	509,700	378,200	643,935	431,600	430,100	433,900	448,500	495,300	642,165	704,223	748,500	751,452	745,726	861,605	904,182
Green Bank Observatory ^c	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	NA	NA	NA	NA	8,629	10,752
Homeland Security Institute	na	na	na	na	NA	20,521	25,370	27,400	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Homeland Security Operational Analysis Center	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	8,622	46,321	54,751	44,736	34,888	52,984
Homeland Security Studies and Analysis Institute	na	na	na	na	na	na	na	na	32,173	33,402	36,870	30,213	22,452	20,866	16,965	22,038	na	na	na	na	na	na
Homeland Security Systems Engineering and Development Institute	na	na	na	na	na	na	na	na	3,387	58,715	85,154	77,159	75,530	94,353	77,176	101,628	104,414	104,689	115,813	136,874	183,588	183,261
Idaho National Laboratory	270,636	259,562	330,154	180,306	232,289	163,074	248,322	236,037	388,062	478,356	425,072	536,399	496,818	479,801	476,376	521,618	482,840	395,112	478,324	494,094	516,691	637,579
Jet Propulsion Laboratory	1,355,463	1,435,039	1,390,560	1,551,171	1,606,409	1,548,019	1,717,203	1,733,597	1,711,528	1,640,341	1,543,969	1,493,613	1,519,258	1,664,539	1,749,689	1,852,369	2,324,826	2,733,908	2,709,063	2,638,412	2,388,355	2,417,556
Judiciary Engineering and Modernization Center	na	na	na	na	na	na	na	na	na	na	4,650	5,309	6,399	2,299	4,318	9,289	8,030	6,697	7,331	6,765	5,493	na
Lawrence Berkeley National Laboratory	408,487	467,461	441,500	482,159	482,672	485,626	503,775	573,917	611,711	759,381	788,386	767,554	768,563	762,601	792,457	797,831	813,267	832,457	872,237	916,082	966,972	1,031,716
Lawrence Livermore National Laboratory	1,090,875	1,227,111	1,286,215	1,425,840	1,456,368	1,431,019	1,353,980	1,301,874	1,321,633	1,370,747	1,424,993	1,353,454	1,313,293	1,170,571	1,273,066	1,363,525	1,290,134	1,386,687	1,517,429	1,558,071	1,613,673	1,659,808
Lincoln Laboratory	380,200	451,200	522,851	594,822	627,201	622,993	618,011	641,386	706,555	789,502	822,358	873,104	827,298	830,076	914,071	949,138	969,090	1,013,320	1,103,870	1,115,927	1,136,133	1,142,615
Los Alamos National Laboratory	1,333,194 ^e	1,994,031	2,106,145	1,986,235	2,101,211	2,145,200	2,046,260	2,073,538	2,172,179	2,505,913	2,307,197	2,056,878	1,708,000	1,767,000	1,865,000	1,987,000	1,972,769	2,145,232	2,461,275	2,722,375	2,974,164	3,811,602
National Astronomy and Ionosphere Center	10,986	12,295	11,508	12,285	13,831	14,108	13,591	12,586	14,738	13,203	14,317	na	na	na	na	na	na	na	na	na	na	na
National Biodefense Analysis and Countermeasures Center	na	na	na	na	na	na	6,320	12,979	19,934	50,058	41,786	31,201	29,849	30,310	30,716	32,902	34,991	37,598	39,003	42,330	44,968	45,870
National Center for Atmospheric Research	119,846	157,173	140,756	154,714	135,893	153,343	144,293	161,130	203,627	220,328	198,231	169,743	172,527	162,259	166,385	177,422	171,551	158,260	199,476	188,484	181,010	188,238
National Cybersecurity Center of Excellence	na	na	na	na	na	na	na	na	na	na	na	na	na	na	7,843	13,076	13,436	19,556	22,205	23,557	33,671	27,955
National Defense Research Institute	25,512	25,317	26,908	26,550	25,747	34,203	38,152	40,051	42,265	51,652	46,330	53,832	59,460	62,073	56,736	62,848	69,013	57,743	67,647	64,134	66,170	61,097
National Radio Astronomy Observatory	34,208	43,900	42,842	42,215	52,023	40,771	129,000	146,098	151,396	137,607	81,305	79,168	93,253	85,327	89,689	90,411	91,720	100,691	101,901	100,078	94,202	92,476
National Renewable Energy Laboratory	207,230	197,438	221,496	226,460	211,323	196,449	190,874	229,399	273,640	326,652	386,539	398,873	347,368	359,998	378,436	362,087	357,916	388,500	455,016	511,585	559,151	603,356
National Security Engineering Center	29,458	31,163	32,696	35,932	37,213	37,073	46,368	936,228	939,312	925,027	941,187	946,737	928,614	885,382	919,441	966,542	1,012,155	1,078,610	1,143,861	1,143,701	1,468,298	1,286,520
National Solar Observatory	na	na	na	na	na	na	na	na	na	11,549	11,724	10,236	10,648	10,039	11,752	12,783	11,841	14,733	15,931	16,892	17,684	33,849
NSF's National Optical-Infrared Astronomy Research Laboratory (NSF's NOIRLab)	37,364	41,051	44,409	43,020	52,775	54,616	53,608	55,922	56,972	45,596	36,165	36,321	30,021	25,161	23,660	24,917	25,906	33,874	38,262	72,686	75,251	81,505

TABLE 7

Total R&D expenditures at federally funded research and development centers, by FFRDC: FYs 2001–22

(Dollars in thousands)

FFRDC	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011 ^a	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Oak Ridge National Laboratory	581,135	620,328	690,538	776,203	897,252	928,090	1,083,509	1,251,336	1,259,259	1,538,412	1,558,073	1,553,460	1,451,684	1,293,722	1,333,332	1,283,729	1,403,204	1,399,445	1,470,372	1,632,684	1,760,578	1,803,543
Pacific Northwest National Laboratory	562,000	608,500	679,000	692,370	779,522	749,365	851,512	885,984	1,064,230	1,116,648	1,095,923	1,033,768	934,491	1,021,912	951,099	914,747	983,962	956,193	1,012,136	1,071,249	1,168,268	1,294,614
Princeton Plasma Physics Laboratory	76,021	73,610	66,764	75,255	81,803	78,151	75,720	78,154	81,113	83,932	84,863	81,389	85,088	97,768	81,348	82,246	81,444	82,435	91,271	107,662	115,505	120,347
Project Air Force	29,361	32,439	33,555	33,049	35,742	39,107	39,315	41,794	45,162	43,957	44,171	41,031	36,003	39,351	44,393	49,165	48,521	48,858	48,325	46,936	47,966	46,517
Sandia National Laboratories	1,416,796	1,583,348	1,742,861	1,833,571	1,946,435	1,968,488	2,031,309	2,076,786	2,043,509	2,157,022	2,277,166	2,293,307	2,412,476	2,507,099	2,621,891	2,781,547	2,878,000	3,009,105	3,373,217	3,395,241	3,542,756	3,811,529
Savannah River National Laboratory	87,164	93,602	94,423	94,326	98,650	102,547	114,895	118,400	130,292	127,160	134,530	132,357	115,857	121,013	121,675	125,881	141,477	154,281	176,379	176,093	191,803	182,654
Science and Technology Policy Institute	7,311	8,878	6,710	3,681	5,415	6,800	5,600	6,000	5,100	6,000	8,700	7,547	5,010	10,949	8,724	7,459	8,401	8,086	9,080	9,256	9,784	10,593
SLAC National Accelerator Laboratory	145,979	171,343	164,747	206,402	205,690	214,026	231,960	234,316	294,421	354,393	327,716	329,747	327,005	316,646	310,167	313,031	327,453	341,615	368,938	382,264	396,780	432,078
Software Engineering Institute	37,052	45,088	45,412	57,920	62,262	75,636	80,566	80,963	89,077	99,334	107,837	113,371	134,973	123,217	131,146	145,981	132,967	142,891	140,954	141,291	120,443	129,316
Systems and Analyses Center	92,930	98,236	110,200	126,226	118,600	130,400	141,500	146,500	166,000	156,000	156,200	149,150	142,977	145,211	157,645	169,580	163,125	168,034	177,948	171,335	173,792	201,338
Thomas Jefferson National Accelerator Facility	102,202	106,305	106,966	104,659	113,349	96,228	81,242	82,254	88,834	90,456	90,456	94,167	100,031	105,868	128,036	120,009	107,320	118,631	125,796	130,850	139,479	152,832

e = estimated by institution. na = not applicable. NA = not available; data were not provided by institution.

FFRDC = federally funded research and development center; NSF = National Science Foundation.

^a R&D expenditures decreased in FY 2011 due to removal of expenditures for capital projects. In this survey, R&D expenditures do not include capital projects. In previous years, some FFRDCs included capital expenditures in their R&D totals. Previous years include an unknown amount of capital expenditures, estimated to be less than \$500 million per year.^b Prior to FY 2014, the Aerospace Corporation reported only internal R&D projects. After discussion with the National Center for Science and Engineering Statistics, the Aerospace Corporation agreed to report all R&D expenditures for FY 2014 and provide revised data to include all R&D expenditures for FYs 2010–13.^c Prior to the FY 2021 collection, the National Center for Science and Engineering Statistics discovered that the Green Bank Observatory had split from the National Radio Astronomy Observatory on 1 October 2016; both retained FFRDC status. For FYs 2017–20, R&D expenditures reported for the National Radio Astronomy Observatory included the expenditures for the Green Bank Observatory. The Green Bank Observatory began reporting separately on the FY 2021 survey.**Source(s):**

National Center for Science and Engineering Statistics, FFRDC Research and Development Survey.

TABLE 8

Total and federally financed R&D expenditures at federally funded research and development centers, by FFRDC: FYs 2019–22

(Dollars in thousands)

FFRDC	Total				Federally financed			
	2019	2020	2021	2022	2019	2020	2021	2022
All FFRDCs	22,737,500	23,514,241	24,921,476	26,524,014	22,338,855	23,133,501	24,509,691	25,962,005
University-administered FFRDCs	6,946,262	7,003,132	6,850,276	7,165,067	6,796,696	6,867,741	6,700,555	7,015,547
Ames Laboratory	33,612	32,844	34,214	38,520	33,211	32,302	34,016	38,032
Argonne National Laboratory	810,693	859,658	856,568	962,973	787,513	840,237	832,400	934,724
Fermi National Accelerator Laboratory	334,258	300,002	319,051	330,294	333,460	299,811	317,812	329,131
Green Bank Observatory ^a	NA	NA	8,629	10,752	NA	NA	8,629	10,384
Jet Propulsion Laboratory	2,709,063	2,638,412	2,388,355	2,417,556	2,709,063	2,638,412	2,388,355	2,417,556
Lawrence Berkeley National Laboratory	872,237	916,082	966,972	1,031,716	807,967	862,965	910,428	971,554
Lincoln Laboratory	1,103,870	1,115,927	1,136,133	1,142,615	1,084,953	1,093,081	1,110,465	1,119,338
National Center for Atmospheric Research	199,476	188,484	181,010	188,238	187,615	175,316	161,163	171,310
National Radio Astronomy Observatory	101,901	100,078	94,202	92,476	99,881	98,458	93,313	91,913
National Solar Observatory	15,931	16,892	17,684	33,849	15,892	16,472	17,680	33,800
NSF's National Optical-Infrared Astronomy Research Laboratory (NSF's NOIRLab)	38,262	72,686	75,251	81,505	28,760	69,685	73,393	79,193
Princeton Plasma Physics Laboratory	91,271	107,662	115,505	120,347	91,119	103,856	113,591	119,828
SLAC National Accelerator Laboratory	368,938	382,264	396,780	432,078	352,527	366,936	382,252	419,094
Software Engineering Institute	140,954	141,291	120,443	129,316	140,940	141,291	120,443	129,316
Thomas Jefferson National Accelerator Facility	125,796	130,850	139,479	152,832	123,795	128,919	136,615	150,374
Nonprofit-administered FFRDCs	7,511,486	7,913,603	9,079,002	9,171,826	7,355,318	7,760,212	8,909,281	8,998,910
Aerospace Federally Funded Research and Development Center	1,065,989	1,114,741	1,128,241	1,152,833	1,062,804	1,109,291	1,121,569	1,147,041
Arroyo Center	37,956	35,248	38,304	40,856	37,956	35,248	38,304	40,856
Brookhaven National Laboratory	590,470	595,466	637,658	655,988	561,030	569,925	620,000	639,527
Center for Advanced Aviation System Development	174,123	180,634	230,484	189,490	152,539	163,497	207,828	164,992
Center for Communications and Computing	68,371	67,072	65,255	74,759	68,371	67,072	65,255	74,759
Center for Enterprise Modernization	174,712	190,408	263,661	235,436	173,127	190,408	263,661	235,317

TABLE 8

Total and federally financed R&D expenditures at federally funded research and development centers, by FFRDC: FYs 2019–22

(Dollars in thousands)

FFRDC	Total				Federally financed			
	2019	2020	2021	2022	2019	2020	2021	2022
Center for Naval Analyses	96,697	95,874	96,391	93,567	96,697	95,874	96,391	93,567
Center for Nuclear Waste Regulatory Analyses	6,987	6,762	5,630	4,323	6,340	6,359	5,233	3,595
CMS Alliance to Modernize Healthcare	213,369	228,162	348,269	286,693	213,369	228,162	348,269	286,693
Homeland Security Operational Analysis Center	54,751	44,736	34,888	52,984	54,751	44,736	34,888	52,984
Homeland Security Systems Engineering and Development Institute	115,813	136,874	183,588	183,261	115,813	135,713	182,413	181,702
Idaho National Laboratory	478,324	494,094	516,691	637,579	463,588	481,146	503,977	630,446
Judiciary Engineering and Modernization Center ^b	7,331	6,765	5,493	na	7,331	6,708	5,493	na
National Biodefense Analysis and Countermeasures Center	39,003	42,330	44,968	45,870	39,003	42,330	44,968	45,869
National Cybersecurity Center of Excellence	22,205	23,557	33,671	27,955	22,205	23,557	33,671	27,955
National Defense Research Institute	67,647	64,134	66,170	61,097	67,647	64,134	66,170	61,097
National Renewable Energy Laboratory	455,016	511,585	559,151	603,356	405,923	456,336	497,047	536,683
National Security Engineering Center	1,124,861	1,143,701	1,468,298	1,286,520	1,123,616	1,142,013	1,463,965	1,282,762
Oak Ridge National Laboratory	1,470,372	1,632,684	1,760,578	1,803,543	1,454,122	1,616,580	1,746,756	1,789,100
Pacific Northwest National Laboratory	1,012,136	1,071,249	1,168,268	1,294,614	993,733	1,053,982	1,142,925	1,266,328
Project Air Force	48,325	46,936	47,966	46,517	48,325	46,936	47,966	46,517
Savannah River National Laboratory ^c	na	na	191,803	182,654	na	na	189,428	179,848
Science and Technology Policy Institute	9,080	9,256	9,784	10,593	9,080	9,256	9,784	10,593
Systems and Analyses Center	177,948	171,335	173,792	201,338	177,948	170,949	173,320	200,679
Industry-administered FFRDCs	8,279,752	8,597,506	8,992,198	10,187,121	8,186,841	8,505,548	8,899,855	9,947,548
Frederick National Laboratory for Cancer Research	751,452	745,726	861,605	904,182	751,452	745,726	861,605	904,182
Lawrence Livermore National Laboratory	1,517,429	1,558,071	1,613,673	1,659,808	1,480,978	1,526,467	1,580,263	1,633,185
Los Alamos National Laboratory	2,461,275	2,722,375	2,974,164	3,811,602	2,440,514	2,701,388	2,950,380	3,629,955

TABLE 8

Total and federally financed R&D expenditures at federally funded research and development centers, by FFRDC: FYs 2019–22

(Dollars in thousands)

FFRDC	Total				Federally financed			
	2019	2020	2021	2022	2019	2020	2021	2022
Sandia National Laboratories	3,373,217	3,395,241	3,542,756	3,811,529	3,340,658	3,358,481	3,507,607	3,780,226
Savannah River National Laboratory ^c	176,379	176,093	na	na	173,239	173,486	na	na

na = not applicable. NA = not available; data were not provided by institution.

FFRDC = federally funded research and development center; NSF = National Science Foundation.

^a Prior to the FY 2021 collection, the National Center for Science and Engineering Statistics discovered that the Green Bank Observatory had split from the National Radio Astronomy Observatory on 1 October 2016; both retained FFRDC status. For FYs 2017–20, R&D expenditures reported for the National Radio Astronomy Observatory included the expenditures for the Green Bank Observatory. The Green Bank Observatory began reporting separately on the FY 2021 survey.

^b The Judiciary Modernization Engineering Center was decertified as an FFRDC on 31 January 2021.

^c In FY 2021, Savannah River National Laboratory acquired a new nonprofit administrator: Battelle Savannah River Alliance, LLC. Prior to the FY 2021 collection, Savannah River National Laboratory was administered by an industrial firm administrator: Savannah River Nuclear Solutions, LLC.

Source(s):

National Center for Science and Engineering Statistics, FFRDC Research and Development Survey.

Technical Notes

Survey Overview

Purpose. The FFRDC Research and Development Survey is conducted by the National Center for Science and Engineering Statistics (NCSES) within the National Science Foundation (NSF). It is the primary source of information on research and development (R&D) expenditures that are separately accounted for at federally funded research and development centers (FFRDCs) in the United States.

Data collection authority. The information is solicited under the authority of the NSF Act of 1950, as amended, and the America COMPETES Reauthorization Act of 2010. The Office of Management and Budget control number for the FY 2022 FFRDC R&D Survey is 3145-0100, with an expiration date of 31 July 2025.

Survey contractor. ICF.

Survey sponsor. NCSES.

Key Survey Information

Frequency. Annual.

Initial survey year. 2001.

Reference period. FY 2022.

Response unit. Establishment.

Sample or census. Census.

Population size. 42.

Sample size. The survey is a census of all known eligible FFRDCs.

Survey Design

Target population. All FFRDCs.

Sampling frame. The total survey universe is identified through the Master Government List of FFRDCs (<https://www.nsf.gov/statistics/ffrdclist/>). NSF is responsible for maintaining this list and queries all federal agencies annually to determine any changes to, additions to, or deletions from the list.

Sample design. The FFRDC R&D Survey is a census of all eligible organizations.

Data Collection and Processing Methods

Data collection. The FY 2022 survey announcements were sent by e-mail to all FFRDCs in November 2022. The data collection period concluded in April 2023. Respondents could choose to complete a questionnaire downloaded from the Web or use a Web-based data collection system to respond to the survey. Every effort was made to maintain close contact with respondents to preserve the consistency and continuity of the resulting data. Survey data reports were available on the survey website for each FFRDC; these reports showed comparisons between the current year and the 2 prior years of data and noted any substantive disparities.

Respondents using the Web-based data collection system were asked to explain significant differences between current year reporting and past year reporting while completing the questionnaire. Questionnaires were carefully examined by survey staff for completeness upon receipt. Reviews focused on unexplained missing data and explanations provided for changes in reporting patterns. If additional explanations or data revisions were needed, respondents were sent personalized e-mails asking them to provide any necessary revisions before the final processing and tabulation of data. These e-mails included a link to the Web-based collection system, to help respondents review and correct their data.

Respondents were encouraged to correct prior year data, if necessary. When respondents updated or amended figures from past years, NCSSES made corresponding changes to trend data in the FY 2022 data tables and to the underlying microdata. For accurate historical data, use only the most recently released data tables.

Mode. Respondents could respond to the survey by completing a PDF questionnaire downloaded from the Web or by using a Web-based data collection system. All FFRDCs submitted data using the Web-based survey.

Response rates. All 42 FFRDCs included on the Master Government List of FFRDCs during the FY 2022 survey cycle completed the key survey questions.

Data editing. The FFRDC R&D Survey was subject to very little editing; respondents were contacted and asked to resolve possible self-reporting issues themselves. Questionnaires were carefully examined by survey staff upon receipt. These reviews focused on unexplained missing data and explanations provided for changes in reporting patterns. If additional explanations or data revisions were needed, respondents were sent personalized e-mail messages asking them to provide any necessary revisions before the final processing and tabulation of data.

Imputation. No data were imputed for FY 2022.

Weighting. FFRDC R&D Survey data were not weighted.

Variance estimation. No variance estimation techniques were used.

Survey Quality Measures

Sampling error. Because the FY 2022 survey was a survey distributed to all organizations in the universe, there was no sampling error.

Coverage error. Given the availability of a comprehensive FFRDC list, there is no known coverage error for this survey. FFRDCs are identified through the NSF [Master Government List of FFRDCs](#). NSF is responsible for maintaining the master list and queries all federal agencies annually to determine changes to, additions to, or deletions from the list.

Nonresponse error. Most FFRDCs have incorporated the data needed to complete most of the survey questions into their record-keeping systems. Eleven FFRDCs chose not to complete any of Question 4 (R&D costs), which asks for expenditures by type of cost. Ten of those FFRDCs are managed by private companies for whom salary information is considered proprietary. One FFRDC, which is managed by a university, does not capture direct and indirect costs in their financial system in a way that is reportable on Question 4. Other FFRDCs did not answer all sections of Question 4: two FFRDCs could not provide information on software and equipment expenditures, and one could not provide data on equipment expenditures. One FFRDC did not report its operating budget (Question 5). Eight FFRDCs chose not to complete Question 6, which asks for full-time equivalents and headcounts for R&D staff. Six of those FFRDCs are managed by private companies for whom staffing structure information is considered proprietary. Variables for Questions 4, 5, and 6 are not tabulated and are not included in the public use file.

Measurement error. NCSSES discovered during the FY 2011 survey cycle that seven FFRDCs were including capital project expenditures in the R&D totals reported on the survey. Corrections made for the FY 2011 survey cycle lowered total expenditures by \$468 million. However, previous years still include an unknown amount of capital expenditures in the total. The amount is estimated to be less than \$500 million per year.

Prior to the FY 2011 survey, the five FFRDCs administered by the MITRE Corporation had reported only internally funded R&D expenditures. After discussions with NCSES, these five FFRDCs agreed to report all FY 2011 operating expenditures for R&D and to revise their data for FYs 2008–10.

NCSES discovered during the FY 2013 survey cycle that Los Alamos National Laboratory (LANL) was reporting some expenditures that were not for R&D, as defined by this survey. Corrections made for the FY 2013 survey cycle lowered the laboratory's total expenditures by \$349 million. LANL also was incorrectly reporting that all expenditures were for basic research. In corrections made for FY 2013, LANL reported that \$1,554 million (91%) of its total research expenditures was for applied research. LANL data from previous years still include an unknown amount of expenditures that were not for R&D and categorize all expenditures as basic research.

Prior to FY 2014, the Aerospace FFRDC reported only expenditures on internal R&D projects. After discussions with NCSES, the Aerospace Corporation agreed to report all R&D expenditures for FY 2014 and provide revised data to include all R&D expenditures for FYs 2010–13. R&D expenditures increased by more than \$800 million each year.

Prior to the FY 2021 collection, NCSES discovered that the Green Bank Observatory had split from the National Radio Astronomy Observatory on 1 October 2016, both retained FFRDC status. For FY 2017–20, R&D expenditures reported for the National Radio Astronomy Observatory, include the expenditures for the Green Bank Observatory. The Green Bank Observatory began reporting separately on the FY 2021 survey.

NCSES discovered during the FY 2022 survey cycle that two FFRDCs, Idaho National Laboratory and Savannah River National Laboratory, were incorrectly classified as industry-administered FFRDCs for select years. Idaho National Laboratory's industrial firm administrator, Bechtel BWXT Idaho, LLC, was replaced by a nonprofit administrator, Battelle Energy Alliance, LLC, in February 2005. The classification was corrected for FY 2022 and Idaho National Laboratory's FYs 2005–21 data were reclassified as coming from a nonprofit-administered FFRDC. Savannah River National Laboratory's industrial firm administrator, Savannah River Nuclear Solutions, LLC, was replaced by a nonprofit administrator, Battelle Savannah River Alliance, LLC, in December 2020. The classification was corrected for FY 2022 and Savannah River National Laboratory's FY 2021 data were reclassified as coming from a nonprofit-administered FFRDC.

Data Comparability (Changes)

Annual data are available for FYs 2001–22. When the review for consistency between each year's data and submissions in prior years reveals discrepancies, it is sometimes necessary to modify prior year data. For accurate historical data, use only the most recently released data tables. Individuals wishing to analyze trends other than those in the most recent NCSES publication are encouraged to contact the Survey Manager for more information about the comparability of data over time.

Changes in survey coverage and population. Most years, there are some changes to the FFRDC population that may affect trend analyses. FFRDCs have been created, decertified, renamed, or restructured, as described below:

- On 20 December 2006, the National Biodefense Analysis and Countermeasure Center was created.
- Prior to FY 2009, the Center for Enterprise Modernization was listed as the Internal Revenue Service FFRDC.
- On 5 March 2009, the Homeland Security Studies and Analysis Institute and the Homeland Security Systems Engineering and Development Institute were created. These new FFRDCs replaced the Homeland Security Institute.
- On 1 October 2009, the National Solar Observatory split from the National Optical Astronomy Observatory, with both retaining their FFRDC status.
- On 2 September 2010, the Judiciary Engineering and Modernization Center was created.
- Prior to FY 2011, the National Security Engineering Center was listed as C3I FFRDC.

- On 1 October 2011, the National Astronomy and Ionosphere Center was decertified as an FFRDC.
- Prior to FY 2012, the Frederick National Laboratory for Cancer Research was listed as the National Cancer Institute at Frederick.
- On 27 September 2012, the Centers for Medicare and Medicaid Services FFRDC was created. On 15 August 2013, its name was changed to the CMS Alliance to Modernize Healthcare.
- Prior to FY 2013, the Systems and Analyses Center was listed as the Studies and Analyses Center.
- On 19 September 2014, the National Cybersecurity Center of Excellence was created.
- On 15 September 2016, the Homeland Security Operational Analysis Center was created.
- On 1 October 2016, Green Bank Observatory was split out from the National Radio Astronomy Observatory, both retained FFRDC status.
- The Homeland Security Studies and Analysis Institute was phased out on 31 October 2016.
- In June 2020, the National Optical Astronomy Observatory changed its name to NSF's National Optical-Infrared Astronomy Research Laboratory or NSF's NOIRLab.
- The Judiciary Engineering and Modernization Center was decertified as an FFRDC in January 2021.

Changes in questionnaire. FFRDCs are asked to provide R&D expenditures by source of funding and type of R&D. In FY 2016, NCSSES added a question asking for R&D expenditures funded by seven specific federal agencies. In FY 2019, NCSSES added a question asking which federal agencies not specifically listed in the previous question funded the expenditures. In FY 2022, NCSSES added a question (Question 6) asking for full-time equivalents (FTEs) and headcounts for personnel by R&D function.

Changes in reporting procedures or classification. The FFRDC R&D Survey has been conducted annually for university-administered FFRDCs since FY 1953 and for all FFRDCs since FY 2001.

Definitions

- *Federal agency.* Any agency of the United States government. Expenditures were reported by seven specific agencies (Department of Defense; Department of Energy; Department of Health and Human Services, including the National Institutes of Health; Department of Homeland Security; Department of Transportation; National Aeronautics and Space Administration; and the National Science Foundation). FFRDCs listed up to ten other agencies with corresponding expenditure amounts.
- *Fiscal year.* FFRDC's financial year.
- *Full-time equivalent.* Calculated as the total working effort spent on research during the fiscal year divided by the total effort representing a full-time schedule within the same period.
- *Headcount.* The number of personnel paid from R&D accounts during the fiscal year.
- *Research and development (R&D).* R&D activity is creative and systematic work undertaken to increase the stock of knowledge—including knowledge of humankind, culture, and society—and to devise new applications of available knowledge. R&D covers three activities: basic research, applied research, and experimental development. R&D does not include outreach, non-research training programs, capital projects (i.e., construction or renovation of research facilities), routine testing, or policy development.

- *R&D expenditures.* Expenditures for R&D activities from the organization's current operating funds that were separately accounted for. For the purposes of the survey, R&D includes expenditures from funds designated for research. Expenditures come from internal or external funding and include recovered and unrecovered indirect costs. Funds passed through to subrecipient organizations are also included.
- *R&D functions:*
 - *Researchers.* Professionals engaged in the conception or creation of new knowledge, products, processes, methods, and systems and in the management of the projects concerned. Researchers contribute more to the creative aspects of R&D, whereas technicians provide technical support.
 - *R&D technicians.* Persons whose main tasks require technical knowledge and experience in one or more fields of science or engineering, but who contribute to R&D by performing technical tasks such as computer programming, data analysis, ensuring accurate testing, operating lab equipment, and preparing and processing samples under the supervision of researchers.
 - *R&D support staff.* Employees not directly involved with the conduct of a research project but support the researchers and technicians. These employees might include clerical staff, financial and personnel administrators, report writers, patent agents, safety trainers, equipment specialists, and other related employees.
- *Source of funds:*
 - *U.S. federal government.* Any agency of the U.S. government. Federal funds that were passed through to the reporting organization to another organization were included.
 - *State and local government.* Any state, county, municipality, or other local government entity in the United States, including state health agencies.
 - *Business.* Domestic or foreign for-profit organizations. Funds from a company's nonprofit foundation were not reported here; they were reported under Nonprofit organizations.
 - *Nonprofit organizations.* Domestic or foreign nonprofit foundations and organizations. Funds from universities and colleges were not reported here; they were reported in All other sources.
 - *All other sources.* Sources not reported in other categories, such as funds from foreign governments and foreign or U.S. universities.
- *Total operating budget.* Total executed operating budget excluding capital construction costs.
- *Type of cost.* R&D expenditures were reported in the following categories:
 - *Salaries, wages, and fringe benefits.* Includes compensation for all R&D personnel, whether full time or part time, temporary or permanent, including salaries, wages, and fringe benefits paid from organization funds and from external support.
 - *Software purchases.* Includes payments for all software, both purchases of software packages and license fees for systems.
 - *Equipment.* Includes payments for movable equipment, including ancillary costs such as delivery and setup.
 - *Subcontracts.* Payments to subcontractors or subrecipients for services on R&D projects.
 - *Other direct costs.* Other costs that did not fit into one of the above categories, including (but not limited to) travel, computer usage fees, and supplies.
 - *Indirect costs.* Includes all indirect costs (overhead) associated with R&D projects.

- *Type of R&D.* R&D expenditures were reported in the following categories:
 - *Basic research.* Experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view.
 - *Applied research.* Original investigation undertaken to acquire new knowledge. It is directed primarily toward a specific, practical aim or objective.
 - *Experimental development.* Systematic work, drawing on knowledge gained from research and practical experience and producing additional knowledge, which is directed to producing new products or processes or to improving existing products or processes.

Acknowledgments and Suggested Citation

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