Contracts & Grants Q118 Award Report

Federal funding and the 2018 budget

Extramural funding summary

The federal FY 2018 budget currently being debated in Washington is likely to generate significant shifts in UC's sponsored project activity. For the past several years, including even the first year of the current administration, federal agency project funding to UC has remained fairly constant, in the range of $3.3 to $3.4 billion. Despite Congressional turmoil over health care, tax reform and other fiscal matters, the Budget Act of 2015 has been a stabilizing influence. It set agency appropriations for federal fiscal years 2016 and 2017 at close to previous levels, with the result that UC's federal project funding has remained about the same for the past four years.

Non-federal funding during this period has also remained relatively steady, reflecting a healthy, if slow-growing national economy, and ongoing partnerships with California state agencies for research and service programs. UC's sponsored project totals for federal FY 2016 and 2017 (which concluded with UC's Q118) are essentially identical: about 6.0 billion for 2017 and 6.05 billion for 2016. This Quarterly Award Report includes an analysis of federal fiscal year funding by agency.

Looking at just the current quarter, however, award totals are around 5% below the same quarter last year — about $1.95 billion for the quarter compared to $2.05 billion last year. This variation is not due to federal agency funding, which is fractionally above last year for the quarter, but a result of smaller contributions from state agencies and corporate partners, whose award totals can vary considerably quarter by quarter.

Since October 1, the federal government has been operating under a continuing resolution, which keeps agency funding at last year's levels. How the remainder of the federal fiscal year shapes up is still uncertain, and entirely dependent on the federal budget currently being debated by Congress. The expectation, based on prior policy pronouncements, is that medical research funded by the National Institutes of Health is likely to increase slightly, with a focus on research areas specified in the 21st Century Cures Act passed by Congress in 2016. The budget for the National Science Foundation, UC's second-largest sponsored project funder, is likely to be reduced by up to 11%. Climate science funded through NASA, the Environmental Protection Agency and the National Oceanic and Atmospheric Administration (NOAA, which is part of the Commerce Department), estimated at about $200 million annually, could be dramatically curtailed.

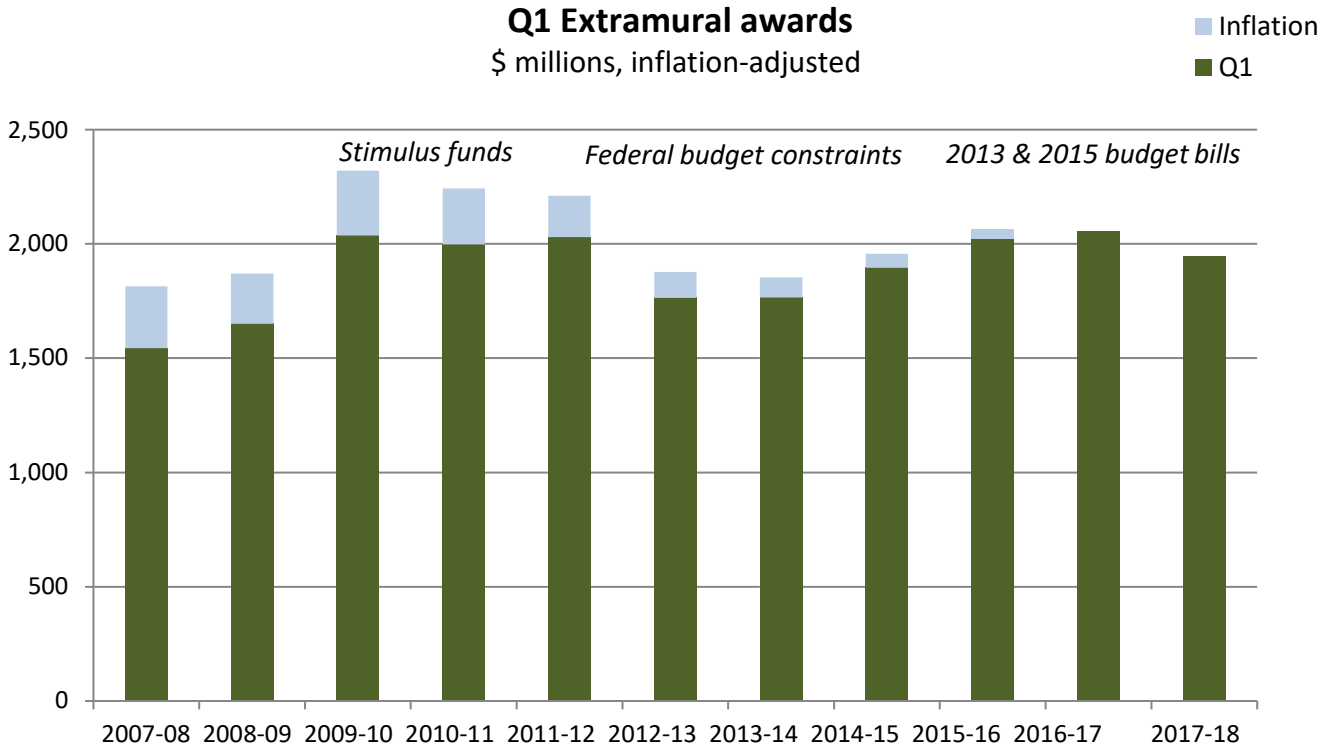
Overall, the federal award total for the year is likely to remain close to the current $3.3+ billion level, but with medical research providing an even larger share than it does at present.

For more information and analysis

Several interactive data visualizations and data tables are available online at the UC Information Center. These include a visualization showing UC's research award history since 1999, a geographic representation of UC's project sponsors, and data tables summarizing UC's annual award and proposal totals. Also available in the Research section of the UCOP Institutional Research and Academic Planning website is a series of Topic Briefs presenting detailed analysis of recent trends in UC's federal, state, corporate and non-profit funding. (Link urls are listed on last page.)

I. Quarterly award metrics

For the first quarter of FY 2017-18, award funding from all sources came to $1.95 billion, about $107 million, or 5.2%, below last year's Q1 total.



Even though there has been significant growth in award funding since federal budget constraints were lifted in 2014, quarterly and yearly inflation-adjusted totals are still below where they were when stimulus funds were available.

Extramural awards by quarter

$ millions, inflation-adjusted

	08-09	*09-10*	*10-11*	*11-12*	*12-13*	*13-14*	*14-15*	*15-16*	*16-17*	*17-18*
Q1	1,870	2,322	2,242	2,211	1,877	1,853	1,957	2,066	2,054	1,947
Q2	1,122	1,212	1,257	1,044	1,090	1,250	1,080	1,069	1,125	
Q3	1,036	1,253	1,065	1,070	1,113	1,120	1,130	1,125	1,178	
Q4	1,567	1,567	1,486	1,491	1,462	1,767	1,747	1,881	1,727	
FY	*5,595*	*6,354*	*6,051*	*5,817*	*5,542*	*5,991*	*5,914*	*6,142*	*6,084*	

Award totals vary over the course of a fiscal year as a consequence of the federal funding cycle. Federal award reporting peaks during the last two quarters of the federal fiscal year; in UC's fiscal year, these quarters correspond to Q4 of one fiscal year and to Q1 of the next. With direct federal sponsorship providing 55-60% or more of all UC's awards, the federal funding cycle produces sharp quarterly spikes in overall funding.

II. Award trends by sponsor category

Federal agencies continue to provide the majority of UC's contracts and grants, and federal funding has been relatively constant for the last four years. The large federal award totals for 2009-10 through 2011-12 reflect the additional Recovery Act (ARRA) funds received from federal agencies.

Q1 awards by sponsor category, FY 2008-09 to 2017-18

$ millions, inflation-adjusted

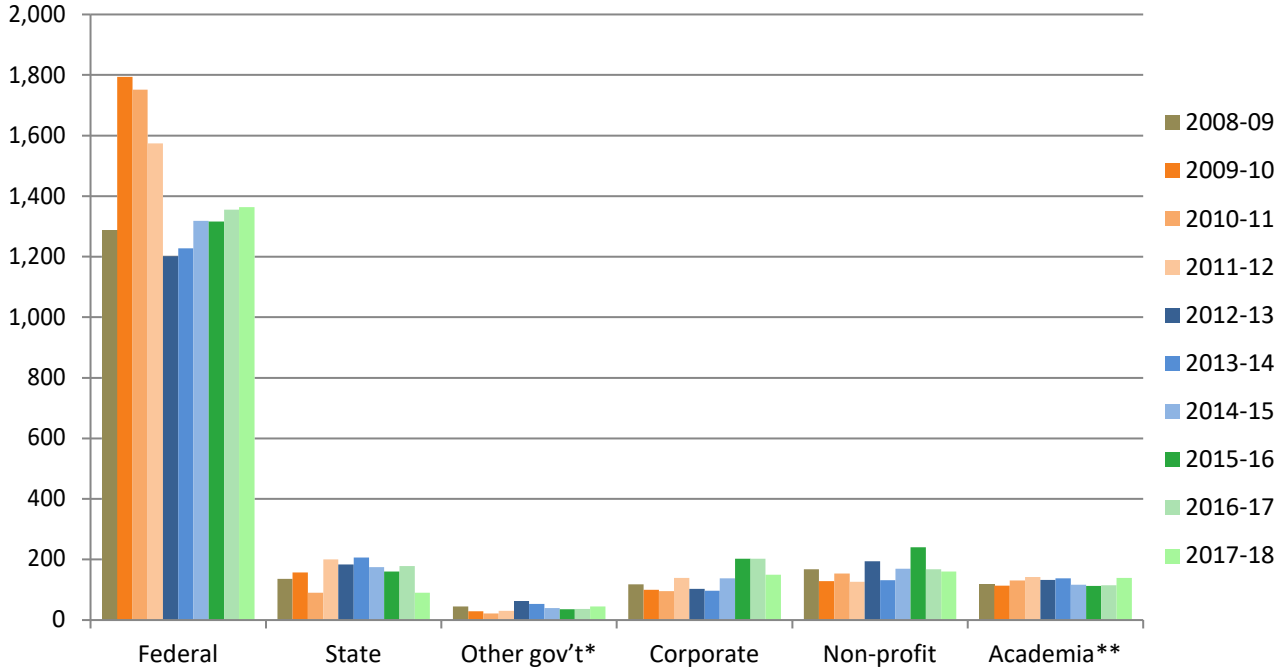
SPONSOR	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*	*2016-17*	*2017-18*
Federal	1,287	1,794	1,752	1,574	1,201	1,228	1,318	1,316	1,355	1,364
State	136	157	90	200	183	206	175	160	178	91
*Other gov't**	45	29	21	30	63	53	40	35	36	44
Corporate	117	100	95	139	103	97	138	203	202	149
Non-profit	168	129	154	126	194	132	169	240	168	160
*Academia***	117	114	130	142	133	138	117	112	114	139
TOTAL $	***1,870***	***2,322***	***2,242***	***2,211***	***1,877***	***1,853***	***1,957***	***2,066***	***2,054***	***1,947***

** Other government includes agricultural market order boards.*
***Academia includes the categories of higher education, DOE labs, campuses and UCOP.*

Direct federal funding to UC during Q118 was about $1.36 billion, or about two-thirds of the quarterly total. This represents a modest increase of about 0.7% over Q1 of last year. Q1 award totals show more consistency in recent federal funding than from state and private sponsors, which are not tied to an annual review cycle. Section VII of this report includes a detailed analysis of federal agency funding on a full federal fiscal year basis.

Q1 Funding by sponsor category, 2008-09 to 2017-18

$ millions, inflation-adjusted



In addition to $1.36 billion in direct federal funding for Q118, $122 million in federal funds came to UC indirectly, as flow-through funds (also referred to as sub-awards) from non-federal sponsors. The main sources of flow-through funds this quarter are other research universities and non-profit organizations with federal awards. California state agencies generally provide substantial federal flow-through funds as well, though they aren't necessarily reported during the fiscal year's first quarter.

Q1 Flow-through funds by sponsor category, FY 2017-18

($ millions)

SPONSOR	*FLOW-THROUGH $*	*AWARD TOTAL $*	*% OF TOTAL*
State	1.5	90.7	1.7%
Other gov't.	7.4	44.5	16.7%
Business	9.0	149.1	6.0%
Non-profit	27.4	159.7	17.2%
Higher education	63.9	85.8	74.5%
DOE Labs	2.7	9.7	28.0%
Campuses/OP	9.8	43.4	22.6%
Total	***$121.8***	***$582.8***	***20.9%***

When sub-awards are included, the true federal contribution to UC's award funding for the quarter is about 75% of the total. The federal contribution is elevated during this quarter, so on a full- fiscal-year basis the true federal contribution is closer to two-thirds.

III. Award trends by project type

Research awards from all sources during Q118 amounted to $1.61 billion, including $117 million in clinical trial sponsorship. Training, service and other awards came to about $335 million. The dramatic increase in clinical trial funding since 2013-14 is due almost entirely to corporate sponsorship. Last year, during FY 2016-17, clinical trial awards totaled nearly $510 million, $456 million of this from corporate sponsors. This trend is likely to parallel the continued growth of the global pharmaceutical industry during 2017-18 and beyond.

Q1 award amounts by project type

$ millions, inflation-adjusted

PROJECT TYPE	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*	*2016-17*	*2017-18*
Research	1,428	1,824	1,801	1,819	1,355	1,409	1,485	1,541	1,475	1,495
Clinical trials	45	57	49	46	54	73	101	137	132	117
Training	146	167	157	134	132	104	119	120	115	102
Public service	133	104	102	117	175	153	116	118	133	133
Other projects	118	171	134	95	162	114	135	151	199	99
TO	***1,870***	***2,322***	***2,242***	***2,211***	***1,877***	***1,853***	***1,957***	***2,066***	***2,054***	***1,947***

IV. Award trends by recipient location

Award totals for Q118 are about 1% below last year overall, with significant variation among locations.

Q1 Awards by location

$ millions, inflation-adjusted

UC LOCATION	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Yearly change
Berkeley	241	345	340	349	313	261	301	294	355	258	-27.4%
Davis	242	247	260	327	271	214	234	257	225	254	12.9%
Irvine	90	110	120	122	93	112	105	122	101	111	9.8%
Los Angeles	352	450	426	298	226	257	338	322	320	278	-13.2%
Merced	6	12	10	8	10	8	9	8	15	12	-20.0%
Riverside	37	53	38	47	39	45	42	49	51	53	5.2%
San Diego	295	383	350	384	310	276	288	321	305	307	0.6%
San Francisco	402	471	510	480	458	502	492	546	498	491	-1.4%
Santa Barbara	69	116	76	75	57	82	58	59	69	72	3.5%
Santa Cruz	50	62	44	56	41	42	46	38	43	54	25.3%
Ag & Nat Res	12	6	5	4	5	6	7	8	6	9	41.6%
LBNL	55	54	58	57	41	48	36	38	60	48	-19.7%
UCOP	18	13	5	5	12	0	0	5	6	1	-90.2%
TOTAL $	***1,870***	***2,322***	***2,242***	***2,211***	***1,877***	***1,853***	***1,957***	***2,066***	***2,054***	***1,947***	***-5.2%***

The location with the largest dollar decrease compared to Q1 of last year is UC Berkeley, and that is principally due to last year's $80 million federal/state Title IV-E social work training program award, which was reported in Q1.

V. Significant campus awards

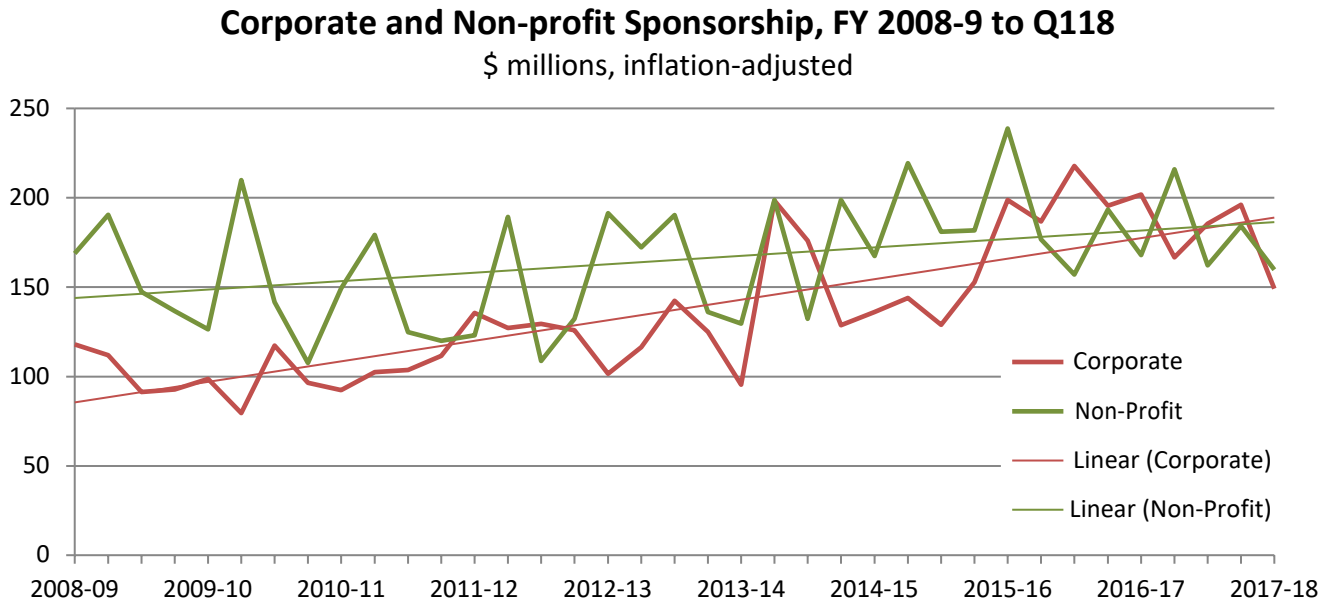
During Q118, UC received more than 6,600 contracts and grants from about 1,500 sponsors, plus 1,200 Material Transfer Agreements. Listed below are significant awards reported this quarter by campuses, Agriculture & Natural Resources, Lawrence Berkeley National Lab and the Office of the President. Because federal awards to UC peak during this quarter, the great majority of UC's major awards are federal. The largest of these was the National Science Foundation's annual Graduate Research Fellowship Program grant to UC Berkeley, which amounted to $24.6 million reported this quarter. Other UC locations also receive substantial NSF funds to support academic doctoral research and this was UC Irvine's largest award this quarter as well.

UC LOCATION	SPONSOR CATEGORY	SPONSOR	PROJECT TITLE	AMOUNT
Berkeley	Federal	National Science Foundation	Graduate Research Fellowship Program	$24,600,000
Davis	Federal	National Institute on Aging	MRI Measures of Cerebrovascular Injury and AD Atrophy in a Study of Latinos	$14,700,000
Irvine	Federal	National Science Foundation	Graduate Research Fellowship Program	$4,500,000
Los Angeles	Federal	Department of Defense, Navy Installations Command	FOCUS (Families Overcoming and Coping Under Stress)	$10,200,000
Merced	Federal	Small Business Administration	UC Merced Small Business Development Center	$1,100,000

Riverside	Federal	Department of Energy	Spins and Heat in Nanoscale Electronic Systems (SHINES)	$3,000,000
San Diego	Federal	National Oceanic and Atmospheric Administration	The Cooperative Institute For Marine Ecosystems and Climate (CIMEC) at Scripps Institution of Oceanography	$16,400,000
San Francisco	Federal	National Center for Advancing Translational Sciences (NIH)	Clinical and Translational Science Institute	$17,000,000
Santa Barbara	Federal	Department of Energy, Advanced Research Projects Agency — Energy	Intelligent Reduction of Energy Through Photonic Integration for Datacenters (Intrepid)	$4,400,000
Santa Cruz	Federal Subaward	National Oceanic and Atmospheric Administration	CIMEC: Investigations in Fisheries Ecology (Subaward from UCSD Scripps)	$4,500,000
Agriculture & Natural Resources	Federal	National Institute for Food and Agriculture (U.S. Dep't. of Agriculture)	A Western IPM Center led by California, Arizona and Oregon	$1,000,000
Lawrence Berkeley Lab	Federal	National Cancer Institute	Structural Cell Biology of DNA Repair Machines	$3,300,000
Office of the President	Federal	National Science Foundation	DMP Roadmap: Making Data Management Plans Actionable	$300,000

VI. Private Funding Sources

Private sources of funding have been steadily increasing in both dollar amount and relative importance. Federal agency support remains the dominant source of extramural funding, but discounting stimulus funds and inflation, it has remained essentially flat for the last decade.



Private project funding to UC declined during the recession, but has been steadily increasing since then. Awards from corporate sponsors in FY 2013-14 show a significant spike as a result of a few very large, multi-year clinical trial research contracts. The growth in corporate funding that began in 2015-16 is also due to an increase in clinical trial sponsorship, and reflects both the larger number and increasing cost of conducting clinical trials. The overall trend for both corporate and non-profit sponsorship shows a steady increase that is likely to continue as long as the economy remains strong, and the pharmaceutical industry continues to invest in developing new therapies and treatments.

VII. Federal Agency Funding

UC's Q118 marks the final quarter of federal fiscal year 2017. Federal funding for this year is within a percentage point or two of the totals for the three previous federal fiscal years — with the notable exception of a spike in 2014, thanks to a $133 million award from NASA to UC Berkeley for a multi-site ionospheric research project. The current yearly level of over $3.3 billion still remains below the inflation-adjusted federal totals during the years when Stimulus funds were available. After adjusting for inflation, annual federal awards are essentially where they were just prior to the recession.

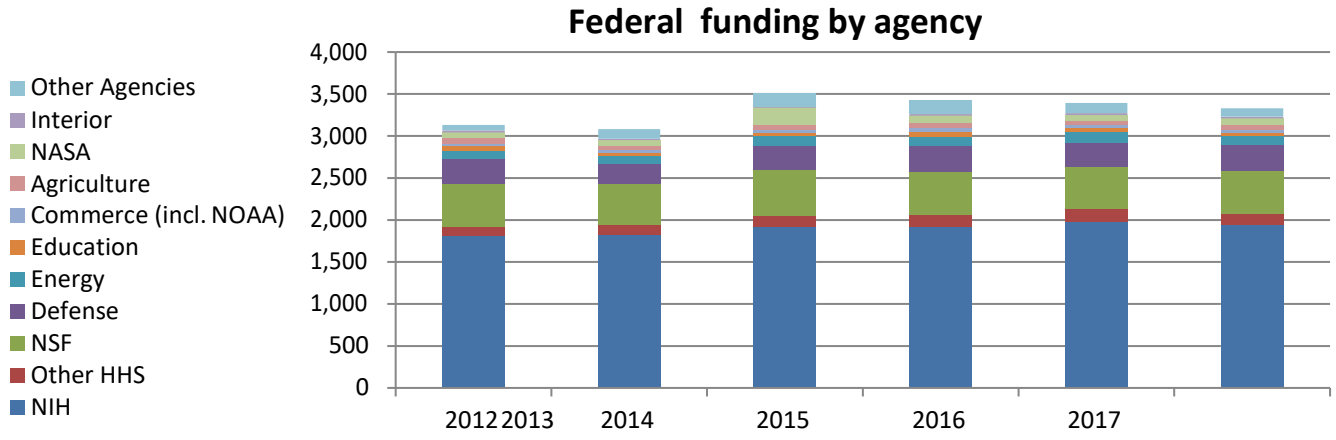
FEDERAL FY	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*
Base awards	3,372	3,445	3,645	3,617	3,124	3,074	3,512	3,424	3,392	3,327
Stimulus funds		459	452	49	7	6				
TOTAL $	***3,372***	***3,904***	***4,097***	***3,666***	***3,131***	***3,080***	***3,512***	***3,424***	***3,392***	***3,327***

Recent agency funding trends pinpoint some of the major areas of change in the period following the Recovery Act (after 2010-11), which included the low point of the 2013 budget sequester, followed by three relatively stable years.

Federal agency funding, FY 2012 to 2016

$ millions, inflation-adjusted

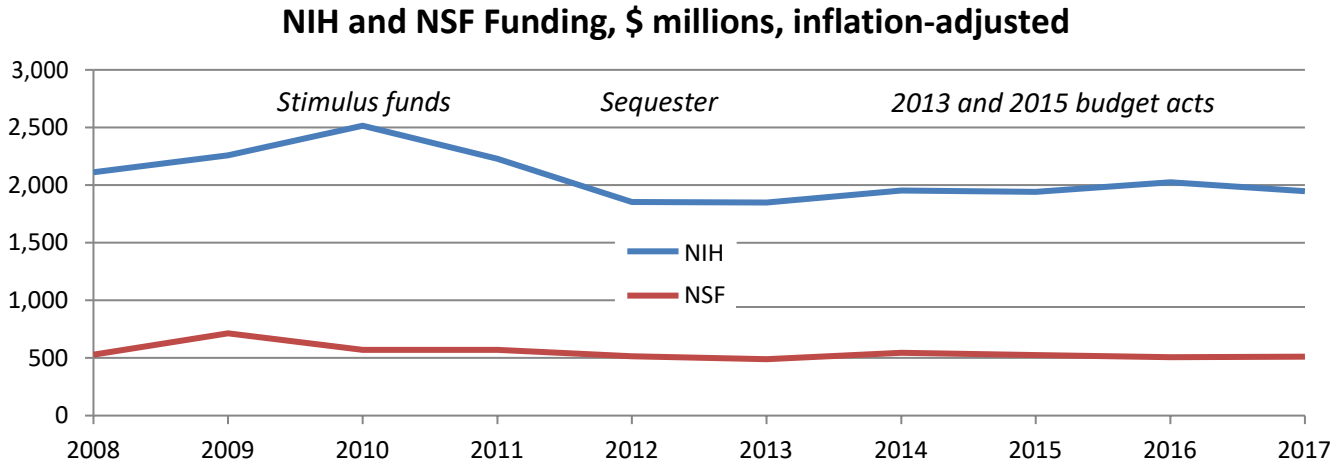
AGENCY	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*change from 2016*
National Institutes of Health	1,810	1,822	1,919	1,920	1,983	1,946	-1.9%
Other Health & Human Services	112	120	138	138	147	124	-15.7%
National Science Foundation	503	482	535	520	496	511	2.9%
Defense	299	248	293	304	292	322	10.2%
Energy	100	94	112	111	132	98	-25.8%
Education	55	38	42	64	51	36	-29.2%
Commerce (incl. NOAA)	31	34	34	38	29	37	26.0%
Agriculture	70	44	55	60	51	61	20.4%
NASA	63	69	208	86	69	78	12.7%
Interior	24	16	21	20	24	17	-29.3%
Other Agencies	65	112	155	163	118	99	-16.7%
TOTAL	***$3,131***	***$3,080***	***$3,512***	***$3,424***	***$3,392***	***$3,327***	-1.9%



VIII. NIH and NSF Funding

Two federal agencies — the National Institutes of Health and the National Science Foundation — provide the core of UC's federal funding, representing nearly three-quarters of the federal total. NIH generally provides close to 60% of UC's direct federal funding (with additional amounts received as flow-through funds). The National Science Foundation is UC's second-largest source of extramural funds, supplying about 15% of the federal total. Changes in appropriation levels and research priorities at both agencies can have a profound effect on UC's project activities.

Federal R&D appropriations were dramatically affected by the sequester of 2013, which cut award funding to UC and other research universities. Agency appropriations for academic R&D have been essentially flat for over a decade, except for the couple of years when Recovery Act stimulus funds were available. UC's history of funding from NIH and NSF parallels the federal budget trend, including the two-year spike due to stimulus funds.



FY	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
NIH $	2,110	2,258	2,515	2,228	1,851	1,848	1,952	1,941	2,024	1,946
NSF $	528	714	570	569	514	489	544	526	506	511

IX. The Future of Federal Funding

Federal funding for UC's research, training and service programs has been relatively stable for the past several years, ranging from $3.3 to $3.4 billion before accounting for inflation. The Bipartisan Budget Act of 2013 curtailed some of the sequestration cuts that had reduced federal awards. This was followed by the 2015 budget bill, which called for two further years of modest increases in agency appropriations for academic research and related projects.

What happens from this point on remains uncertain. As of this writing, the federal government is operating under a continuing resolution that keeps funding at last year's levels, while a new budget is being debated. One issue the 2018 budget is expected to address is whether to allow the return of any of the sequester's mandatory spending cuts. The current budget agreement curtailed the sequester only temporarily, and actually extended the spending cuts through 2025 — four years past the original ten-year term, which was set in 2011. Another legislative hiatus will be needed to

prevent those cutbacks to agency appropriations from reappearing in 2018. With the passage of tax reform, Congress may look to reduce deficits by cuts to discretionary spending, such as federally funded research, which is one of the targets of the President's budget proposal.

Regardless of appropriation levels, though, federal research priorities are likely to change. For NIH-funded medical research, the picture is fairly positive. The 21st Century Cures Act, which Congress passed in December 2016 with strong bipartisan support, increased NIH's appropriation by nearly 5% for 2017 to $33.3 billion, and by another 5% for 2018, to more than $34.8 billion. So far, Congress has shown no signs of reducing these appropriations going forward and may even increase them. UC has historically received about an 8% share of NIH research funding, and this is likely to continue.

The National Science Foundation may well see cuts in specific research areas. The President's Budget called for an 11% reduction, which NSF at the time proposed to manage by limiting funds for constructing telescopes, building ocean-going research vessels and supporting the Graduate Research Fellowship. Final actions by Congress and NSF remain to be decided.

One clear policy imperative for the current administration is to curtail research funding for climate science, including monitoring and data collection efforts, fundamental research and climate change mitigation programs. These projects are funded through a variety of federal agencies, including NASA, the Environmental Protection Agency, the National Oceanic and Atmospheric Administration (NOAA, which is part of the Commerce Department) and the Departments of Energy and Defense. UC's federal funding for climate research (including work at Lawrence Berkeley National Laboratory) is estimated at about $200 million annually, could be dramatically curtailed in 2018.

Overall, federal project funding for UC is still likely to remain in the range of $3.3 to $3.4 billion annually, but with a greater emphasis on medical research, and a possible reduction in projects related to climate change.

Link urls:
UC Information Center: https://www.universityofcalifornia.edu/infocenter
UC's research award history: https://www.universityofcalifornia.edu/infocenter/uc-research-award-history
Geographic representation of UC's project sponsors:
https://www.universityofcalifornia.edu/infocenter/sponsored-projects
Data tables summarizing UC's annual award and proposal totals: https://www.universityofcalifornia.edu/infocenter/awards-and-proposals
Research section of the UCOP Institutional Research and Academic Planning IRAP website:
http://www.ucop.edu/institutional-research-academic-planning/content-analysis/research/index.html