

Leveraging Web Capabilities To Reduce Burden and Cost:

Establishment Survey Example



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Thank You

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About the NSF HERD Survey

- Higher Education Research and Development (HERD) Survey
- Annual census of U.S. universities and colleges that granted bachelor's degrees or higher and had \$150,000 or more in R&D expenditures in the previous fiscal year
- Recent populations have included about 950 universities and colleges.
- Institutionalized: A version of this survey has been fielded by NSF every year since the early 1970s. Some respondents have been doing the survey for decades.
- High response rates: The response rate is typically at or above 95%. Most data are made available to the public at the institutional level, so universities and colleges are motivated to respond.



About the HERD Survey

- Economic survey: Most questions request details about R&D expenditures. Respondents are typically from the finance or sponsored programs office.
- Although there is a paper form, 99% of submitted surveys are completed on the Web.
- The Web survey includes lots of tools to make completing the survey easier
 - Most questions include at least one autosum but some include dozens.
 - There are several cross-question comparisons.
 - Respondents are warned when a value is significantly different from the previous year's.



Higher Education Research and Development (HERD) Survey

[Home](#)

FY 2012 Survey

Status: 28 Questions - 2 Completed, 26 Errors

[View PDF with data](#)

= not started = completed = trend variance = errors

R&D expenditures by source and type

Status

1 R&D expenditures by source of funds

1 warning

Question 1. How much of your total expenditures for research and development (R&D) came from the following sources in FY 2012? [See definition of R&D](#) (PDF)

- In rows a, b, c, d, and f: Include both **direct** and **recovered indirect costs** (reimbursement of F&A costs from external sponsors).
- Report the **original source** of funds, when possible.
- Include **all** fields of R&D (e.g., sciences, engineering, humanities, education, law, arts). See full listing in Question 9.

Source of funds	R&D expenditures (Dollars in thousands) <i>(for example, report \$25,342 as \$25)</i>
a. U.S. federal government Any agency of the United States government. Include federal funds passed through from another institution.	\$ 43,004
b. State and local government Any state, county, municipality, or other local government entity in the United States, including state health agencies. Include state funds that support R&D at agricultural and other experiment stations. <i>Public institutions</i> should report state appropriations restricted for R&D activities here rather than in row e, Institutional funds.	\$ 126
c. Business Domestic or foreign for-profit organizations. Report funds from a company's nonprofit foundation in row d.	\$ 34
d. Nonprofit organizations Domestic or foreign nonprofit foundations and organizations. Report funds from your institution's 501(c)3 foundation in row e1.	\$ 803
e. Institutional funds	
1. Institutionally financed research All R&D funded by your institution from accounts that are only used for research. (Confidential) <input type="button" value="lock"/>	\$ 5,000
2. Cost sharing Include committed cost sharing other than unrecovered indirect costs. Report unrecovered indirect costs in row e3. (Confidential) <input type="button" value="lock"/>	\$ 0
3. Unrecovered indirect costs Calculate this amount as follows for your externally funded R&D only (preferably on a project-specific basis) using the appropriate cost rate—on-campus, off-campus, etc. • First, multiply the negotiated rate by the corresponding base. • Second, subtract recovered indirect costs. (Confidential) <input type="button" value="lock"/>	Unavailable
4. Total institutional funds	\$ 5,000
f. All other sources Other sources not reported above, such as funds from foreign governments.	\$ 340
g. Total	\$ 49,307

Comments:

(500 characters remaining)

[Clear form](#)



▼ [9C-E. R&D expenditures by field and federal agency source: Environmental sciences, Mathematical sciences, Computer sciences](#)



Question 9C-E. What were your FY 2012 R&D expenditures in the environmental, mathematical, and computer sciences funded by the federal agency sources below? (R&D expenditures from nonfederal sources will be reported in Question 12.)

Enter Zeros in Blank Fields

If you have no expenditures to report for this section, "0" will be entered in all blank fields.

Enter Unavailable in Blank Fields

If you cannot provide this information at this time, "Unavailable" will be entered in all blank fields.

Enter 0 for no expenditures and "U" for Unavailable.

R&D expenditures from federal sources

(Dollars in thousands)

	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
R&D Fields	USDA + subagencies	DoD + subagencies	Energy + subagencies	HHS, includes NIH + subagencies	NASA	NSF	Other Agencies you can report here	Total
C. Environmental Sciences								
1. Atmospheric sciences	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
2. Earth sciences	\$ 248	\$ 232	\$ 238	\$ 6,715	\$ 142	\$ 1,484	\$ 4,819	\$ 13,878
3. Oceanography	\$ 89	\$ 672	\$ 0	\$ 0	\$ 36	\$ 2,671	\$ 860	\$ 4,328
4. Other environmental sciences	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 2,060	\$ 2,060
5. Total	\$ 337	\$ 904	\$ 238	\$ 6,715	\$ 178	\$ 4,155	\$ 7,739	\$ 20,266
D. Mathematical Sciences	\$ 0	\$ 367	\$ 327	\$ 181	\$ 0	\$ 3,334	\$ 5	\$ 4,214
E. Computer Sciences	\$ 0	\$ 2,651	\$ 1,242	\$ 1,230	\$ 0	\$ 6,852	\$ 216	\$ 12,191

Comments:

(500 characters remaining)

[Clear form](#)



Recent Challenges

- After many years of little change, the survey was significantly redesigned before the FY 2010 collection.
- As part of the redesign several new questions were added.
- The survey needed to allow for the submission of partial data, even within a single question, while still running automated checks.
- After a lengthy data collection period for the FY 2010 survey, we needed to find cost effective ways of speeding up survey review and approvals.
- The increased burden for respondents and data collection staff necessitated an increased focus on the usability of the survey system.



Submitting Partial Data

FY 2010 Survey

- Respondents were asked to leave the cells for unavailable values blank.



Submitting Partial Data

FY 2010 Survey

- Respondents were asked to leave the cells for unavailable values blank.

Blank Cells:

Question 2: If data are not available, please leave the cell blank. If you had no expenditures for a cell, enter "0."



Submitting Partial Data

FY 2010 Survey

- Respondents were asked to leave the cells for unavailable values blank.
- On a separate screen respondents were asked to verify whether blank cells should be 0 or “not available.”



Submitting Partial Data

Q13. Of the total amount of R&D expenditures reported in Question 1 what were the amounts for the following types of costs?

You left some or all items in this question blank. Please select the reason or enter missing values.

- Response is zero
- Data not available (please explain in the comment box below)

Additional comments about your response:

(500 characters remaining)

You left some or all items in this question blank. Please select the reason or enter missing values.

- Response is zero
- Data not available (please explain in the comment box below)

Q14. At the end of FY 2010, what was the value of software (in thousands) for software development?

You left some or all items in this question blank. Please select the reason or enter missing values.

- Response is zero
- Data not available (please explain in the comment box below)

Additional comments about your response:

(500 characters remaining)

Q16A-C. For the fields of R&D below, what portion of your FY 2010 R&D expenditures went for the purchase of capitalized R&D equipment? Engineering, physical sciences, environmental sciences

You left some or all items in this question blank. Please select the reason or enter missing values.

- Response is zero
- Data not available (please explain in the comment box below)



Submitting Partial Data

FY 2010 Survey

- Respondents were asked to leave the cells for unavailable values blank.
- On a separate screen respondents were asked to verify whether blank cells should be 0 or “not available.”
- The data collection staff had to follow up with almost 100% of respondents and it took 6 months to clarify submitted data.



Submitting Partial Data

FY 2011 Survey

- A survey can no longer be submitted with blank cells.
- Dropdown lists on each cell allow respondents to select 0 or Unavailable, or enter the requested value.



Submitting Partial Data

FY 2011 Survey

- A survey can no longer be submitted with blank cells
- Dropdown lists on each cell allow respondents to select 0 or Unavailable, or enter the requested value.

R&D expenditures
(Dollars in thousands)

14,000 ▼

0
Unavailable

\$ 46,732 ▼

\$ 60,732



Submitting Partial Data

FY 2011 Survey

- A survey can no longer be submitted with blank cells
- Dropdown lists on each cell allow respondents to select 0 or Unavailable, or enter the requested value.
- Specialized dropdown lists are used for some fields.

	(1) Software	(2) Equipment
Capitalization thresholds	<input type="text" value="Don't capitalize"/>	<input type="text" value="\$ 5.0"/>

The image shows a screenshot of a survey form with a light green background. It contains two columns of data entry fields. The first column is labeled '(1) Software' and the second is labeled '(2) Equipment'. The row is labeled 'Capitalization thresholds'. The first field has a dropdown menu open, showing 'Don't capitalize' and 'Unavailable' as options. The second field contains the text '\$ 5.0' and has a small dropdown arrow on its right side.



Submitting Partial Data

FY 2011 Survey

- A survey can no longer be submitted with blank cells
- Dropdown lists on each cell allow respondents to select 0 or Unavailable, or enter the requested value.
- Specialized dropdown lists are used for some fields.
- Follow-ups by data reviewers dropped by 40% and the collection was 2 months shorter.
- End-of-year data processing was also easier because there was less recoding of submitted data.



Pre-submittal Data Checks

FY 2010 Survey

- Some data checks were presented out of context on a separate screen.
- Respondents could view only one question screen at a time, so it was difficult to compare answers across questions.



Pre-submittal Data Checks

- Not started
- ? Needs your review
- ✓ Ready to submit

Review Your Data

Submit Your Data

FY 2010 Question List

Questions 1–6: R&D expenditures by source and type

- ✓ [Question 1](#) R&D expenditures by source of funds
- ? [Question 2](#) Foreign funding for R&D
- ? [Question 3](#) Contracts and grants
- ? [Question 4](#) R&D at medical schools
- ? [Question 5](#) Clinical trial R&D
- ✓ [Question 6](#) Types of R&D: Basic research, applied research, and development

Questions 7–8: Pass-through and subrecipient R&D expenditures

- ✓ [Question 7](#) Subrecipient R&D expenditures
- ? [Question 8](#) R&D expenditures passed through

Questions 9–11: R&D expenditures from federal sources

- ✓ [Question 9A](#) R&D expenditures by field and federal agency source: Engineering
- [Question 9B](#) R&D expenditures by field and federal agency source: Physical sciences
- [Question 9C–E](#) R&D expenditures by field and federal agency source: Environmental sciences, mathematical sciences, computer sciences
- [Question 9F](#) R&D expenditures by field and federal agency source: Life sciences
- [Question 9G–I](#) R&D expenditures by field and federal agency source: Psychology, social sciences, other sciences
- [Question 9J–K](#) R&D expenditures by field and federal agency source: Non-science and engineering fields
- [Question 10](#) Other federal agency sources
- ? [Question 11](#) R&D funded by the American Recovery and Reinvestment Act (ARRA)

Question 12: R&D expenditures from nonfederal sources

- [Question 12A–B](#) R&D expenditures by field and nonfederal source: Engineering, physical sciences
- [Question 12C–I](#) R&D expenditures by field and nonfederal source: Environmental sciences, mathematical sciences, computer sciences, life sciences, psychology, social sciences, other sciences
- [Question 12J–K](#) R&D expenditures by field and nonfederal source: Non-science and engineering fields

Questions 13–15: R&D expenditures by cost elements

- [Question 13](#) Cost elements of R&D



Pre-submittal Data Checks

FY 2010 Survey

- Some data checks were presented out of context on a separate screen.
- Respondents could view only one question screen at a time, so it was difficult to compare answers across questions.
- It was difficult for respondents to identify the problematic value, particularly on questions with larger grids.



Pre-submittal Data Checks

Warnings:

Question 9A, row 5, column h: This value represents a large decrease from last year's value. To compare data from both years, return to the Main Menu and click on Compare your 2008-2010 survey answers. Please use the box labeled 'Comments' on this screen to explain trend variances.

Question 9A, row 8, column h: This value represents a large decrease from last year's value. To compare data from both years, return to the Main Menu and click on Compare your 2008-2010 survey answers. Please use the box labeled 'Comments' on this screen to explain trend variances.

Question 9A, row 9, column b: This value represents a large decrease from last year's value. To compare data from both years, return to the Main Menu and click on Compare your 2008-2010 survey answers. Please use the box labeled 'Comments' on this screen to explain trend variances.

R&D expenditures from federal sources [ⓘ]								
(Dollars in thousands)								
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
	USDA	DoD	Energy	HHS,	NASA	NSF	Other	Total
	+ subagencies	+ subagencies	+ subagencies	includes NIH			Agencies you can	
				+ subagencies			report here	
R&D Fields [ⓘ]								
A. Engineering								
1. Aeronautical/ Astronautical	\$ 0	\$ 708	\$ 126	\$ 0	\$ 1,221	\$ 382	\$ 661	\$ 3,098
2. Bioengineering/ Biomedical eng.	\$ 224	\$ 0	\$ 646	\$ 588	\$ 1	\$ 252	\$ 1,418	\$ 3,129
3. Chemical	\$ 420	\$ 1,399	\$ 3,266	\$ 943	\$ 0	\$ 2,589	\$ 2,451	\$ 11,068
4. Civil	\$ 0	\$ 263	\$ 0	\$ 137	\$ 36	\$ 1,394	\$ 3,465	\$ 5,295
5. Electrical	\$ 21	\$ 2,920	\$ 776	\$ 138	\$ 0	\$ 6,705	\$ 1,889	\$ 12,449
6. Mechanical	\$ 0	\$ 604	\$ 71	\$ 0	\$ 0	\$ 1,363	\$ 1,186	\$ 3,224
7. Metallurgical/ Materials	\$ 0	\$ 3,465	\$ 501	\$ 464	\$ 74	\$ 2,396	\$ 2,949	\$ 9,849
8. Other engineering	\$ 23	\$ 108	\$ 1,495	\$ 32	\$ 0	\$ 1,299	\$ 10,580	\$ 13,537
9. Total	\$ 688	\$ 9,467	\$ 6,881	\$ 2,302	\$ 1,332	\$ 16,380	\$ 24,599	\$ 61,649



Pre-submittal Data Checks

FY 2010 Survey

- Some data checks were presented out of context on a separate screen.
- Respondents could view only one question screen at a time, so it was difficult to compare answers across questions.
- It was difficult for respondents to identify the problematic value, particularly on questions with larger grids.
- All explanations for significant differences from last year's data were included in one comment box. Respondents were instructed to, “use the box labeled ‘Comments’ on this screen to explain”.



Pre-submittal Data Checks

FY 2011 and FY 2012 Surveys

- All data error or warning messages appear at the top of the relevant question page.
- Problematic cells are highlighted.



Pre-submittal Data Checks

▼ 1 error, 1 trend variance

Error - Question 13, row d: Pass-through expenditures in row d should match the Total pass-through expenditures in Question 8, row e, column 3: \$10,600

Trend Variance - Question 13, row e: There is a large decrease from last year in the percentage of expenditures going to other direct costs. [Enter an explanation.](#)

Question 13. Of the total amount of R&D expenditures reported in Question 1, row g, what were the amounts for the following types of costs?

Please report only **direct costs** (including cost sharing) in rows a–e.
Recovered and unrecovered **indirect costs** should be reported in rows f1 and f2.

R&D expenditures
(Dollars in thousands)

a. Salaries, wages, and fringe benefits

Include compensation for all R&D personnel whether full-time or part-time, temporary or permanent.
Include salaries, wages, and fringe benefits paid from your institution's funds and from external support.

\$ 23,250 ▼

b. Software purchases

All payments for software. Include both purchases of software packages and license fees for systems.

1. Noncapitalized software

\$ 15,000 ▼

2. Capitalized software

(If you are unable to distinguish capitalized software from capitalized equipment, report both in row c)

\$ 0 ▼

c. Capitalized equipment

Payments for movable equipment exceeding your institution's capitalization threshold. Include ancillary costs such as delivery and setup.

\$ 3,789 ▼

d. Pass-throughs to other universities or organizations

(should match the total in Question 8, row e, column 3)

\$ 10,500 ▼

e. Other direct costs

Other costs that do not fit into one of the above categories, including (but not limited to) travel, tuition waivers, services such as consulting, computer usage fees, and supplies.

\$ 303 ▼

f. Indirect costs



Pre-submittal Data Checks

FY 2011 and FY 2012 Surveys

- All data error or warning messages appear at the top of the relevant question page.
- Problematic cells are highlighted.
- Multiple questions can now be viewed at the same time.



FY 2012 Survey

Status: 28 Questions - 24 Completed, 4 Errors

Resubmit

View PDF with data

R&D expenditures by source and type

Table with 2 columns: Question ID and Status. Includes questions 1-6 regarding R&D expenditures by source and type.

Pass-through and subrecipient R&D expenditures

Table with 2 columns: Question ID and Status. Includes questions 7-8 regarding pass-through and subrecipient R&D expenditures.

R&D expenditures from federal sources

Table with 2 columns: Question ID and Status. Includes questions 9A-11 regarding R&D expenditures from federal sources.

R&D expenditures from nonfederal sources

Table with 2 columns: Question ID and Status. Includes questions 12A-K regarding R&D expenditures from nonfederal sources.

R&D expenditures by cost elements

Table with 2 columns: Question ID and Status. Includes questions 13-15 regarding R&D expenditures by cost elements.

R&D personnel

Table with 2 columns: Question ID and Status. Includes questions 16-17 regarding R&D personnel.

Institutional information

Table with 2 columns: Question ID and Status. Includes question 18 regarding institutional information.

Resubmit

OMB No. 3145-0100
Expiration Date: 10/31/15

Main survey interface showing question 1: R&D expenditures by source and type. Includes a table for 'Source Effects' with columns for question ID, description, and response.

Main survey interface showing question 11: R&D expenditures from federal sources. Includes a table for 'Pass-through and subrecipient R&D expenditures' with columns for question ID, description, and response.





Pre-submittal Data Checks

FY 2011 and FY 2012 Surveys

- All data error or warning messages appear at the top of the relevant question page.
- Problematic cells are highlighted.
- Multiple questions can now be viewed at the same time.
- There is a separate text box for each significant difference from last year that requires an explanation. Something must be entered in that text box before the survey can be submitted.



Pre-submittal Data Checks

▼ 1 error, 1 trend variance

Error - Question 13, row d: Pass-through expenditures in row d should match the Total pass-through expenditures in Question 8, row e, column 3: \$10,600

Trend Variance - Question 13, row e: There is a large decrease from last year in the percentage of expenditures going to other direct costs. [Update explanation.](#)

Question 13. Of the total amount of R&D expenditures reported in Question 1, row g, what were the amounts for the following types of costs?

Question 13, row e Trend Variance Explanation

(462 characters remaining)

Sample explanation for large decrease.

Save

R&D expenditures
(Dollars in thousands)

\$ 23,250

\$ 15,000

\$ 0

\$ 3,789

\$ 10,500

\$ 303

a. Sales

Incl

Incl

sup

b. Soft

All p

sys

1.

2.

c. Cap

Pay

and

d. Pass-throughs to other universities or organizations

(should match the total in Question 8, row e, column 3)

e. Other direct costs

Other costs that do not fit into one of the above categories, including (but not limited to) travel, tuition

uniform services such as consulting, computer usage fees, and supplies



Post-submittal Data Reviews

FY 2010 and FY 2011 Surveys

- All questions and responses were relayed through e-mail and phone calls.
- Questions about data were out of context.
- Changes to data often resulted in new errors that needed to be resolved.
- When revisions were needed to numerical data or comment text, the changes had to be made by data collection staff, adding processing time and more quality controls.



Post-submittal Data Reviews

FY 2012 Survey

- E-mails from the data reviewer direct respondents back to the Web survey.
- Data quality issues are presented at the top of each question, just like pre-submittal errors.
- Respondents can revise data, and if any new errors are triggered, they immediately see the new error.
- Any new explanations are automatically associated with the value in question without cutting and pasting from an e-mail.
- Processing time by data collection staff is reduced.



Post-submittal Data Reviews

▼ 1. R&D expenditures by source of funds

Data Quality Issues

Question 1, row a - Federal R&D expenditures increased from \$43M in FY 2011 to \$59M in FY 2012. You attributed this increase to 2 large grants in the engineering department. However, the increases in engineering expenditures on Question 9 (row A9), only explain a small part of the increase. Please provide more information about the variance or revise your data. [Resolve](#)

[View Your FY 2010-2012 Survey Data](#)

► 1 trend variance, 1 warning

Question 1. How much of your total expenditures for research and development (R&D) came from the following sources in FY 2012? [See definition of R&D \(PDF\)](#)

- In rows a, b, c, d, and f: Include both **direct and recovered indirect costs** (reimbursement of F&A costs from external sponsors).
- Report the **original source** of funds, when possible.
- Include **all fields** of R&D (e.g., sciences, engineering, humanities, education, law, arts). See full listing in Question 9.

Source of funds	R&D expenditures (Dollars in thousands) (for example, report \$25,342 as \$25)
a. U.S. federal government Any agency of the United States government. Include federal funds passed through from another institution.	\$ 59,000
b. State and local government Any state, county, municipality, or other local government entity in the United States, including state health agencies. Include state funds that support R&D at agricultural and other experiment stations. <i>Public institutions</i> should report state appropriations restricted for R&D activities here rather than in row e. Institutional funds.	\$ 866
c. Business Domestic or foreign for-profit organizations. Report funds from a company's nonprofit foundation in row d.	\$ 0
d. Nonprofit organizations Domestic or foreign nonprofit foundations and organizations. Report funds from your institution's 501(c)3 foundation in row e1.	\$ 866
e. Institutional funds	
1. Institutionally financed research All R&D funded by your institution from accounts that are only used for research.	\$ 15 (Confidential)
2. Cost sharing Include committed cost sharing other than unrecovered indirect costs. Report unrecovered indirect costs in row e3.	\$ 0 (Confidential)
3. Unrecovered indirect costs Calculate this amount as follows for your externally funded R&D only (preferably on a project-specific basis) using the appropriate cost rate—on-campus, off-campus, etc. • First, multiply the <u>negotiated</u> rate by the corresponding base. • Second, subtract recovered indirect costs.	\$ 6,253 (Confidential)
4. Total institutional funds	\$ 6,268
f. All other sources Other sources not reported above, such as funds from foreign governments.	Unavailable
g. Total	\$ 67,000

Comments:

(500 characters remaining)



Post-submittal Data Reviews

▼ 1. R&D expenditures by source of funds

Data Quality Issues

Question 1, row a - Federal R&D expenditures increased from \$43M in FY 2011 to \$59M in FY 2012. You attributed this increase to 2 large grants in the engineering department. However, the increases in engineering expenditures on Question 9 (row A9), only explain a small part of the increase. Please provide more information about the variance or revise your data. [Resolve](#)

[View Your FY 2010-2012 Survey Data](#)

► 1 trend variance, 1 warning

Question 1. How much of your total expenditures were for R&D in the following categories?

- In rows a, b, c, d, and f. Include all fields of R&D expenditures.
- Report the original source of funds.
- Include all fields of R&D expenditures.

Source of funds

a. U.S. federal government
Any agency of the United States government, including federal funds passed through to other agencies.

b. State and local government
Any state, county, municipality, or other local government, including state health agencies. Includes state and local health agencies and other experiment stations. *Public institutions should report state and local expenditures rather than in row e, Institutional funds.*

Data Quality Issue

Data Quality Issue - Question 1, row a

Federal R&D expenditures increased from \$43M in FY 2011 to \$59M in FY 2012. You attributed this increase to 2 large grants in the engineering department. However, the increases in engineering expenditures on Question 9 (row A9), only explain a small part of the increase. Please provide more information about the variance or revise your data.

Choose one:

- Provide an explanation
- I have revised my FY 2011 data and this issue is resolved
See "Revise Last Year's Data" on the survey homepage.
- I have revised my FY 2012 data and this issue is resolved

cancel save



Lessons Learned

- The additional programmer time needed to automate processes or revise an interface can be cost effective, if done well.
- You can have a survey that takes advantage of the capabilities of the Web while still being consistent with a paper form.
- Follow-ups with respondents after a survey is submitted is a burden to the respondents, as well as data collection staff.