National Science Foundation
Engineering Research Centers Program

Guidelines for ERCWeb Data Entry for the
Engineering Research Centers
Classes of 2000–2011

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prepared for

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by

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1. CONTENTS

2. INTRODUCTION

The Engineering Research Centers (ERC) Program began collecting annual activity and performance data from each Center soon after the first class of ERCs was awarded in 1985. The repository of data is known as the ERC Indicators Database, or ERCWeb. These data inform the ERCs and National Science Foundation (NSF) about the resources used by and financial management, outcomes, and impacts of each class of ERCs. These data are used by the ERC Program and NSF to monitor the ERCs' performance and report to NSF, the Office of Management and Budget (OMB), and Congress.

The ERCWeb templates for data submission have been developed by the ERC Program's database contractor, ICF Macro. ICF Macro staff maintain the data entry site and underlying database and develop analytical reports for NSF using the submitted data. These reports are used to respond to questions about the program, for budget justifications, and to study trends across Centers over time.

This document has been developed to guide the Centers in the reporting of activity and performance data to NSF. It explains the data to be collected, the input tables for reporting the data, and the output tables that are required for the Centers' annual reports. It should be considered a companion to the Annual Reporting Guidelines document as the Centers prepare their annual reports.

2.1. GETTING STARTED

The ERCWeb database was first established in 2002 and contains data on all centers in existence at that time through the current ERCs. The ERCWeb rebuild began in 2010 and went on line in October 2011.

The login page for ERCWeb is at www.erc-reports.org. ERCWeb is managed by ICF Macro's Project Director, Sean Teehan. He manages a team of Web designers, programmers, and analysts who are familiar with all aspects of the database, how to collect specific types of data, and how to handle entering unusual data. Joey Humenik is the Senior Programmer/Analyst on the ERCWeb team. A toll-free phone number, (866) 281-8548, and an e-mail address, erc@qrc.com, have been set up exclusively for ERCWeb assistance and technical support. New Centers can receive their ERCWeb login ID and password by phone or e-mail.

The ERCWeb site includes the ERC Library, which can be reached via a hyperlink on the ERCWeb login page. The ERC Library consists of a broad range of documents related to reporting, annual and renewal site visits, performance expectations, and reports from studies of the ERC Program. Sample ERCWeb output tables for the Annual Report and a link to the ERC Association Web site are also provided on the ERC Library page. Access to the ERC Library is open to anyone and does not require an ID or password.

It is recommended that new Centers begin by reviewing an online tutorial developed by ICF Macro staff to assist in learning how to navigate ERCWeb, both operationally and in terms of

data entry. The tutorial can be found in the Help section of ERCWeb after you have logged in to the system. The ERCWeb data entry screens also have links to data definitions and data entry instructions. Technical assistance is available through the phone number or e-mail address provided above. E-mail is typically the quickest approach.

2.2.   IMPORTANT DATES AND ESTABLISHING REPORTING PERIODS

A Center must keep track of several periods of time simultaneously in order to properly prepare an Annual Report. Reporting period definitions are provided below, along with examples, and the definitions are repeated in section 8 of this document. The required tables in the Annual Report are completed using data from various time periods.

2.2.1.   Reporting Periods

The Federal Government operates on the Federal fiscal year. The Federal fiscal year begins on October 1 and ends on September 30.

An ERC's Award Year begins on the date that the ERC first receives NSF funding and continues for the following 12 months. These start and end dates remain the same throughout the life of the Center.

The ERC Current Award Year is the Award Year during which a given Annual Report is submitted to NSF. The Current Award Year is the period used in reporting required financial information in ERCWeb and the Annual Report. The ERC Proposed Award Year is the Award Year following the Current Award Year.

The ERC Reporting Year is a 12-month period established by the timing of the Award Year onsite visit, as follows: the Annual Report is due to NSF 5 weeks before the date of the site visit; the Reporting Year end date is set by the Center and should be no more than 2 months before the NSF due date (in other words, no more than 2 months and 5 weeks prior to the site visit date). This ensures that all the data are recent. Once the Reporting Year has been set, it remains constant throughout the life of the Center and covers 12 months of data. (There is typically an exception to this rule for the first reporting period of a new Center; this exception is described in the Annual Reporting Guidelines.)

For example:

ERC award date: September 1, 2003
- Annual site visit date: April 30, 2008 (This date can fluctuate.)
- Annual Report due to NSF date: March 26, 2008 (This date can fluctuate depending on the site visit date.)
- Reporting Year end date: January 26, 2008 (Once established, this date remains constant to ensure that 12 months of data are reported each year.)
- Current Award Year: September 1, 2007, to August 31, 2008
- Proposed Award Year: September 1, 2008, to August 31, 2009

- Reporting Year: January 27, 2007, to January 26, 2008 (The data span the period from 14 months before the report is due (January 27, 2007) to 2 months before the report is due (January 26, 2008) and cover a 12-month interval.)

2.2.2. Reporting Budget and Financial Data

In the case of tables with columns for Current Year budget data, the amount the Center plans to spend during the Current Award Year should be reported based on the amount of support that has already been received within the Current Award Year, plus the amount brought over from the preceding year (residual), plus all amounts for which the Center has documentation that the support will be received before the end of the Current Award Year, such as a Research Experiences for Undergraduates (REU) supplement award where funding is provided over a 3-year period based on performance.

ERCWeb-produced tables 9 and 10 show multiple years of data. The Current Award Year data are based on expected income and expenditures. ERCWeb automatically moves current-year data from a Center's last report to the prior-year column in the new report. On the data entry screens for these tables there is a column for prior-year actual data that must be updated once the Award Year is finished to reflect the actual values received and spent. These completed data are considered actual data—they are based on actual dollar amounts expended or membership renewals received within that Award Year. Once prior-year data have been entered in ERCWeb, the database produces tables and conducts analyses with the full-year data exclusively. The partial-year data are archived but never used again. Data for ERCWeb-produced tables 4 and 11 are handled in a similar manner.

Tables 2 and 10 contain a column for the proposed budget, which summarizes the Center's spending plan for the Proposed Budget – Next Award Year—the year for which the Center is requesting ERC Program support in the Annual Report. This column identifies the Center's plans for spending all expected cash, not just the ERC Program core support. (In table 2, each project's budgets for both the Current Award Year and Proposed Award Year should include only direct research costs (e.g., salary, benefits, equipment, travel) and not overhead charges.)

2.3. SUBMITTING THE DATA

Once all data have been collected and entered, the Center must submit these data officially through the database using the Finish tab on the Data Entry page. Until this is done, the Center has not fulfilled its data entry requirements. ERCWeb staff will notify Centers nearing their Annual Report deadlines of the need to complete data entry and submit the data to ERCWeb. If necessary, corrections of erroneous data or otherwise incomplete data due to unusual circumstances may be arranged with ERCWeb's technical support team with the approval of the NSF Program Director.

Data in a number of tables relate directly to each other in terms of content. As a result, ERCWeb automatically checks to ensure that numbers, percentages, and dollar values that are meant to be the same in two or more tables actually are. If validations catch data that do not correspond,

ERCWeb alerts the Center staff performing data entry with a note explaining the problem, and the system will not produce the final tables and graphics that must be inserted into the Annual Reports until the discrepancy is resolved. ICF Macro staff will work with Center staff to resolve any problems.

Once the data have been submitted, the Center should download all the required ERCWeb-produced tables and charts to insert into the Annual Report. The ERCWeb-produced tables should be inserted exactly as produced; it is not acceptable to delete data rows or columns from standard tables, even if the entries are zeros. Also, the tables and charts must be presented at a scale that is easily readable.

3. ERCWEB TABLE DESCRIPTIONS

Table 1: Quantifiable Outputs—Table 1 includes data on the research, technology transfer, and educational outputs of the Center from its inception through the Current Reporting Year. Data are presented individually for each of the most recent 5 Reporting Years. The All Years column contains totals for everything submitted, and the Early Cumulative Total column shows totals for the years prior to the most recent individual Reporting Years shown.

Table 1a: Average Metrics Benchmarked Against All Active ERCs and the Center's Tech Sector and Class—Table 1a includes values from all input tabs in order to create totals for the current Federal fiscal year. These metrics are then benchmarked against all active ERCs, the Center's specific sector, and the Center's specific class for previous Federal fiscal years.

Table 2: Estimated Budgets by Research Thrust and Cluster—The information presented in this table represents the scope of the research program supported by direct and indirect support to the ERC performed at the lead or core partner, outreach institutions, or diversity partners, including Alliances with NSF Diversity Awardees.

In keeping with the ERC principle of multidisciplinary teams conducting research, the data in Table 2 should be reported in such a way that it aggregates projects devoted to the same goal so that the result shows interdisciplinary teams conducting cluster-level research.

Figure 2a: Research Project Investigators by Discipline—Figure 2a is a disciplinary wheel that presents the percentage of investigators by discipline.

Table 3a: Educational Impact—Table 3a further specifies information about certain outputs reported in table 1. The outputs are:
New courses currently offered
Currently offered, ongoing courses with ERC content
Workshops, short courses, and Webinars
New textbooks based on ERC research

The outputs are categorized as follows:
With engineered systems focus
With multidisciplinary content
Team taught by faculty from more than one department
Undergraduate level
Graduate level
Used at more than one ERC institution

Table 3b: Ratio of Graduates to Undergraduates— Table 3b presents values of graduate students, undergraduate students, REU students, and Young Scholars collected from the Demographics and Academic Institutions tabs and benchmarked against all active ERCs, each specific sector, and each specific class in the first three rows of the table. ERC-specific totals are presented in the last two rows.

Table 4: Industrial/Practitioner Members, Innovation Partners, Funders of Sponsored Projects, Funders of Associated Projects and Contributing Organizations —Included in this table is information about all the different types of organizations involved with the Center.

Information is provided for two time periods:

Prior Reporting Year end date to Current Award Year start date
Current Award Year start date to Current Reporting Year end date

The information includes the name of the organization, the organization sector, the product focus, the type of support and involvement, whether the firm is domestic or foreign, the industry size, the number of sponsored projects, and whether the organization is new.

The summary section includes the total number of industrial/practitioner members, percentages of foreign members, and percentages by size.

Table 4a: Organization Involvement in Innovation and Entrepreneurship Activities—This table displays the types of activities and involvement by the Center's innovation partners, including:

Innovation/Entrepreneurship Training
Incubation Facilities
Technology Screening Activities
Connections to Sources of Commercialization Funding
Other Activity

Table 5: Innovation Ecosystem Partners and Support by Year—Numbers of Industrial/Practitioner members, Innovation Partners, Funders of Sponsored Projects, Funders of Associated Projects, and Contributing Organizations are listed by Reporting Year. Also included is information on sponsored projects and detailed information about the total dollar amount of industrial/practitioner member support provided to the Center.

Figure 5a: Technology Transfer Activities—This figure indicates the types of technology transfer activities supported by the Center's Industrial/Practitioner members, including:

Faculty On Site at organization
Faculty Instruction to Organization
Individual from Organization on Lead Institution Campus
Licensed Software
Licensed Technology (other than software)
Graduate Hired by Organization
Student On Site at Organization
Participation in Test Bed
Other Activities

Figure 5b: Lifetime Industrial/Practitioner Membership History—This figure displays all industrial/practitioner members throughout the life of the Center by Award Years of membership graphically.

Figure 5c: Total Number of Industrial/Practitioner Members—Data for four Award Years of industrial/practitioner memberships are presented graphically.

Figure 5d: Industrial/Practitioner Member Support by Year—Data for the dollar amount and type (membership dues, sponsored projects, etc.) of industrial/practitioner support for the past four award years are presented graphically.

Table 6: Institutions Executing the ERC's Research, Technology Transfer, and Education Programs—The names and types of academic institutions and other organizations executing the ERC's research, technology transfer, and education programs are listed here, as well as total numbers of students, teachers, faculty, postdoc and Young Scholars involved in educational activities.

Figure 6a: Domestic Location of Lead, Core Partner, Outreach, and REU and RET Participants' Institutions—Figure 6a is a map indicating the domestic locations of lead, core partner, and outreach institutions and institutions of REU and Research Experiences for Teachers (RET) in Engineering program participants.

Figure 6b: Country of Citizenship for ERC Foreign Personnel—Figure 6c is a world map indicating the countries of citizenship of foreign personnel.

Table 7: ERC Personnel—Table 7 includes demographic data for all Center personnel from lead, core partner, and collaborating institutions. All demographic data are provided to the Center voluntarily by each individual. In accordance with the Federal Privacy Act, missing information cannot be added by ERC personnel when not provided by individual participants.

Table 7a: Diversity for ERC Faculty and Students—Table 7a shows diversity statistics for women, underrepresented racial minorities, Hispanics/Latinos, and individuals with disabilities for leadership team members, faculty, doctoral students, master's students, and undergraduate students at the Center level as compared to the latest American Society for Engineering Education (ASEE) diversity data. This information is broken out by citizenship and is displayed separately for U.S. citizens and permanent residents and for foreign individuals.

Figure 7b: Women in the ERC—Figure 7b shows statistics for female members of the leadership team, faculty, doctoral students, master's students, and undergraduate students at the Center level as compared to the latest ASEE diversity data.

Figure 7c: Underrepresented Racial Minorities in the ERC—Figure 7c shows statistics for underrepresented racial minorities at the Center level as compared to the latest ASEE diversity data. Categories include leadership team members, faculty, doctoral students, master's students, and undergraduate students.

Figure 7d: Hispanics/Latinos in the ERC—Figure 7d shows statistics for Hispanic/Latino leadership team members, faculty, doctoral students, master's students, and undergraduate students at the Center Level as compared to the latest ASEE diversity data. These data are broken out by citizenship and are displayed separately for U.S. citizens and permanent residents and for foreign individuals.

Figure 7e: Persons with Disabilities in the ERC—Figure 7e shows statistics for individuals with disabilities at the Center level as compared to the latest data on disability from the Division of Science Resources Statistics (SRS) at the National Science Foundation. Categories include leadership team members, faculty, doctoral students, master's students, and undergraduate students.

Table 7f: Center Diversity, by Institution—The numbers and percentages of women, underrepresented racial minorities, and Hispanics/Latinos by institution are presented in this table.

Table 8: Functional Budget—This table represents the functional budget allocations for Direct support and Associated Projects to the Center. Totals for each research thrust are included, as well as totals for general and shared equipment; new facilities/new construction; leadership/administration/management; education programs; industrial collaboration/innovation programs; Center related travel; residual funds remaining; and indirect costs.

This table includes only cash and will equal the current-year total column in Table 9 and the current-year budget column in Table 10. The sum of the Current Year projects in each thrust in table 2 should be the same as the subtotal for that thrust in table 8.

Table 8c: Education Functional Budget—This table represents the functional budget allocations for Direct support and Associated Projects to the Center. Totals for Pre-College Activities; University Education; Student Leadership Council; Young Scholars (Gen-3 only); REU; RET; Assessment; and Community College Activities.

Figure 8a: Functional Budget as a percentage of Direct Support—Figure 8a is a pie chart of the Direct Support portion of the functional budget.

Figure 8b: Functional Budget as a percentage of Associated Project Support—Figure 8b is a pie chart of the Associated Project Support portion of the functional budget.

Table 9: Sources of Support—Table 9 has totals for unrestricted cash, restricted cash, associated project, residual funds, and in-kind sources of support for the Award Year are reported here. Multiple years of data are shown.

Table 10: Annual Expenditures and Budgets—Table 10 displays actual expenditures, current-year budgets, and proposed budgets as well as information on residual funds remaining are reported here. Multiple years of data are shown.

Table 11: Modes of Support by Industry and Other Practitioner Organizations to the Center—Cash and in-kind support from current members, affiliate organizations, contributing organizations, sponsors of associated projects, and sponsored projects is listed here by organization and Award Year for both Received and Promised support.

4. IMPORTING DATA

4.1. OVERVIEW

The following 7 Excel templates are available for your Center to edit or add data outside of the ERCWeb system:

- Organizations
- Institutions
- Personnel
- Thrusts and Clusters
- Projects
- Project Organizations
- Project Personnel

4.2. INSTRUCTIONS

The templates can be downloaded with the current data from the system (recommended) or with column headings only and no data. The Import Data option is available on the Organizations, Institutions, Personnel, and Research Screens of the ERCWeb system, and instructions for use are included in each template file.

Your Center does not have to use all 7 templates; however, any templates used should be uploaded following the Upload Order Rules:

Upload **Institutions**, then **Personnel**
Upload **Thrusts and Clusters**, then **Projects**
Upload **Organizations** and **Projects**, then **Project Organizations**
Upload **Personnel** and **Projects**, then **Project Personnel**

5. ORGANIZATIONS SCREEN

5.1. OVERVIEW

The organizations that work with or support the work of the ERC are reported here. These organizations can provide direct or indirect cash or in-kind support to the Center. All support provided by these organizations is reported in Table 9: Sources of Support, Table 11: Modes of Cash Support by Industry and Other Practitioner Organizations, and Table 5: Innovation Ecosystem Partners and Support by Year for the time period in which support was provided. Organizations are prioritized by the highest level of financial commitment.

For example, a firm provides an equipment donation to the ERC and also provides direct support to an ERC faculty member for a project within the scope of the ERC's strategic plan. This firm is classified at the higher level of "Funders of Sponsored Projects" rather than contributing organization. Organizations must be actively involved in executing the Center's vision in conjunction with Center staff to be included here.

Data are entered for two possible time periods:

Prior Reporting Year end date to Current Award Year start date
Current Award Year start date to Current Reporting Year end date

For associated projects whose funding is part of a larger award that includes faculty outside the Center, include only the funding percentage that is directly in support of the Center's strategic plan or vision.

Data provided here produce:

Table 1: Quantifiable Outputs
Table 1a: Average Metrics Benchmarked Against All Active ERCs and the Center's Tech Sector
Table 4: Industrial/Practitioner Members, Innovation Partners, Funders of Sponsored Projects, Funders of Associated Projects and Contributing Organizations
Table 4a: Organization Involvement in Innovation and Entrepreneurship Activities
Table 5: Innovation Ecosystem Partners and Support by Year
Figure 5a: Technology Transfer Activities
Figure 5b: Lifetime Industrial/Practitioner Membership History
Figure 5c: Total Number of Industrial/Practitioner Members
Figure 5d: Industrial/Practitioner Member Support by Year
Table 9: Sources of Support.
Table 10: Annual Expenditures and Budgets
Table 11: Modes of Support by Industry and Other Practitioner Organizations to the Center

5.2. INSTRUCTIONS

Data is entered here about organization that work with or support the work of the ERC. There are two categories for data entry available under the Organizations Screen: Supporting Organizations and NSF Support

5.2.1. Supporting Organizations

Supporting Organizations include the following:

- Industrial/Practitioner Members
- Innovation Partners
- Funders of Sponsored Projects
- Funders of Associated Projects
- Contributing Organizations

NOTE: Industrial/practitioner members can be listed here only if they have satisfied all requirements for membership according to the Center's membership agreement and cooperative agreement. Industrial/Practitioner members must sign a membership agreement and provide a sufficient level of financial support (cash or in-kind), according to the Center's membership agreement, during the Reporting Year; for all others, appropriate documentation includes signed contracts, etc. Centers may define different levels of membership. One exception is that a signed membership agreement is not required for members in a government sector. Please review the definitions in the glossary (see section 8) for all the types of organizations listed above.

5.2.1.1. Add New Organization

The Add New Organization feature allows you to add to the current year's list of organizations that provided support. Click on **Add New Organization,** and on the Add Organizations page, enter the following data in the appropriate fields to create the organization's profile (NOTE: This information cannot be changed once you click on **Save**):

Organization Name

Support Relationship to Center—Choose from the following list:

Industrial/Practitioner Member
Innovation Partner
Funder of Sponsored Projects
Funder of Associated Projects
Contributing Organization

Sector—Select the sector, Industry Size, and Industry Product Focus for the organization. If you selected "Other" on the previous screen, you must enter a short description here.

Base Location or Headquarters— Click on the corresponding radio button to indicate whether the organization's main headquarters is located in the United States (domestic) or outside the United States (foreign).

Award Year Documentation—Indicate whether the Center has received the necessary documentation to establish another year of committed support.

Delete New Organizations—This feature allows you to delete organization data for a new organization. You may delete only those organizations for which you indicated that support was not provided to the Center. Click on **Delete Organization.** A warning screen appears, giving you the opportunity to either cancel the operation or delete the organization.

After you have entered this information, click on **Save.**

5.2.2. NSF Support

Please provide information on NSF support to the ERC and ERC faculty, as well as information on expenditures and budgets.

5.2.2.1. Cash Support

Enter amounts and sources of unrestricted cash, restricted cash, associated project funds, and residual funds divided into three separate time periods:

Prior Award Year actual
Received by end of Reporting Year
Promised by end of Award Year

Also include an explanation for residual funding in the text box at the bottom of the page.

These data are required for Table 9: Sources of Support of the Annual Report.

NOTE: Do not include any future-year projections in this table or amounts of support that the Center estimates it will receive later in the current year but cannot document.

5.2.2.1.1. Sources of Unrestricted Cash Donations

The sources for unrestricted cash donations are

NSF ERC Base Award
Other NSF (Not ERC Program)

5.2.2.1.2.   Sources of Restricted Cash Donations

The sources for restricted cash donations are:

NSF ERC Program Special Awards and Supplements
Other NSF (Not ERC Program)

5.2.2.1.3.   Sources of Residual Funds

The sources for residual funds are:

NSF ERC Program
Other NSF (Not ERC Program)

NOTE: When unrestricted or restricted cash awards are made in a lump sum and cover multiple years (e.g., $500,000 lump sum award to be used over 3 years), report the full amount of the award in the year in which the award was received—do not report any prorated amounts. While prorating is permissible from an accounting standpoint, reviewers and NSF Program Officers need to see full funding amounts. Enter the full amount of each award in either the unrestricted or restricted cash section of the table, as appropriate. In the year(s) following receipt of the award, report on the residual funds line the amount from the original award not spent in the year in which the award was received or any subsequent year in which only part of the remaining funds from the original award was spent.

5.2.2.2.   Sources of Associated Projects (Direct Costs Only)

The sources for associated projects (direct costs only) are:

NSF ERC Program
Other NSF (Not ERC Program)

After you have entered this information, click on **Save.**

6. INSTITUTIONS SCREEN

6.1. OVERVIEW

The academic institutions executing the ERC's Research, Technology Transfer, and Education Programs are reported here, including:

The Lead Institution
Core Partners
Collaborating Institutions
Foreign Partners
Non-ERC Institutions Providing REU students
Precollege Partners (include number of Young Scholars)
Community Colleges

Data provided here create the following tables:
Table 6: Institutions Executing the ERC's Research, Technology Transfer, and Education Programs
Table 7: ERC Personnel
Table 7f: Center Diversity, by Institution

6.2. INSTRUCTIONS

Data is entered here about academic institutions that work with or support the work of the ERC. There are two categories for data entry available under the Institutions Screen: Academic Institutions and Diversity Alliances.

6.2.1. Add/Edit Current Year Institution Data

Click on **Add New Academic Institution** and provide the following information:

NOTE: Report all AGEP, CREST, LSAMP, and TCUP Awardees and other NSF Diversity Program Collaborations under Institutions: Diversity Alliances.

Institution Name
Institution Type:

The Lead Institution
Core Partners
Collaborating Institutions
Foreign Partners
Non-ERC Institutions Providing REU students
Precollege Partners (include number of Young Scholars)
Community Colleges

Demographic Data. Indicate whether demographic data will be reported.

Other Details (check all that apply):

The U.S. Department of Education maintains lists of Postsecondary Institutions Enrolling Populations with Significant Percentages of Minority Students, available at **http://www2.ed.gov/about/offices/list/ocr/edlite-minorityinst.html** This list includes the following classifications:
Hispanic-Serving Institution
Minority-Serving Institution
Historically Black Colleges and Universities

Has predominantly female students
Has a large number of underrepresented minority students in Engineering

Country
City
State

NOTE: Personnel connected with institutions are updated on the Personnel screens.

After you have entered this information, click on **Save.**

6.2.1.1.   Delete Institution Data

This feature allows you to delete an institution. A warning screen appears, giving you the opportunity to either cancel the operation or delete the institution and the personnel record associated with that institution.

6.2.2. Diversity Alliances

Provide details of all formal relationships your Center has with the NSF Diversity Programs listed on the data entry screen (AGEP, CREST, LSAMP, TCUP and other Alliances).   For AGEP, CREST, LSAMP, or TCUP programs, to add a new alliance select the link "Add a new [AGEP] diversity alliance for this reporting year". On the next page, select an awardee from the drop down list of diversity alliances. Indicate whether demographic data will be reported, and select the demographic characteristics. Return to the list of alliances to add additional alliances.

NOTE: Do not enter an institution in this section until students from that institution have already begun direct involvement with the Center. Collaborations that are too new for student involvement may be discussed in the narrative.

Diversity Alliances, along with lead institutions, core partners, non-ERC institutions providing REU students, and other NSF Diversity Program awardee institutions, will be listed in table 7 in the demographics section so that personnel details can be reported for each institution.

After you have entered this information, click on **Save.**

6.2.2.1.   Delete Diversity Alliance

This feature allows you to delete a Diversity Alliance. A warning screen appears, giving you the opportunity to either cancel the operation or delete the institution and the personnel record associated with that institution.

7. PERSONNEL SCREEN

7.1. OVERVIEW

Report on individuals who manage, lead, or carry out the ERC's research, education, technology transfer and outreach activities.

Also include those personnel who:
- carry out the center's mission through involvement in projects that contribute directly to the center by fulfilling its strategic plan
- are personnel working on research projects reported on the Research tab
- work on activities other than the research program

Data provided here produce:

Table 1a: Average Metrics Benchmarked Against All Active ERCs and the Center's Tech Sector
Table 3b: Ratio of Graduates to Undergraduates
Table 6: Institutions Executing the ERC's Research, Technology Transfer, and Education Programs.
Table 7: ERC Personnel
Table 7a: Diversity for ERC Faculty and Students
Figure 7b: Women in the ERC
Figure 7c: Underrepresented Racial Minorities in the ERC
Figure 7d: Hispanics/Latinos in the ERC
Figure 7e: Persons With Disabilities in the ERC
Figure 7f: Center Diversity, by Institution

7.2. INSTRUCTIONS

Data is entered here about individuals who were considered ERC personnel by virtue of their carrying out ERC outreach activities. There are two categories for data entry available under the Personnel Screen: By Institution and By Person.

7.2.1. Personnel Data Entry

Provide demographic information on ERC personnel by Institution or by Person. All demographic data must be provided to the Center voluntarily by each individual and in accordance with the Federal Privacy Act; missing information cannot be added by ERC personnel. Demographic information can be reported to NSF only if it has been collected for the express purpose of this Annual Report. The Center may have other uses for these data beyond aggregate reporting to NSF, but individuals providing data must be informed about the intended uses when the data are collected.

Indicate an NSF personnel type for each relevant classification. NOTE: Multiple personnel types are allowed, but only one type is allowed within each classification. For example, personnel can be reported as both "Thrust Leader" within the Leadership/Administration classification and "Senior Faculty" within the Research Under Strategic Plan classification.

Students participating in the Center as NSF Diversity Alliance awardees should be reported in conjunction with that award's lead institution. In contrast, REU students and K–12 students and teachers should be reported according to the institution in which they are enrolled or at which they work.

Add the following information for each individual:

Institution
Name
Citizenship—If citizenship is foreign, specify the country of citizenship.
Gender
Disability status
Ethnicity
Race
Discipline
Title and Department Within Institution
NSF Classifications and Personnel Types:

Leadership/Administration:

Directors
Thrust Leader
Research Thrust Management and Strategic Planning
Industrial Liaison Officer
Education Program Leader
Administrative Director
Staff
None

Research Under Strategic Research Plan:

Senior Faculty
Junior Faculty
Research Staff
Visiting Faculty
Industry Researchers
Post Docs
Doctoral Students
Master's Students
Undergraduate Students
Other Visiting College Students

None

Curriculum Under Strategic Curriculum Plan

Senior Faculty
Junior Faculty
Research Staff
Visiting Faculty
Industry Researcher
Post Docs
Doctoral Student
Master's Student
Undergraduate Student
Other Visiting College Student
None

ERC REU Student:

NSF REU Site Award
ERC's own REU
None

Pre-college (K–12):

Teachers (RET)
Teachers (non-RET)
None

8. RESEARCH SCREEN

8.1. OVERVIEW

The information reported here represents the entire ERC research effort, including all projects in the ERC (regardless of source of funds). Projects are reported in terms of the clusters or thrusts of research in the ERC. Education thrusts or projects are not included here and are described in the Education section of the Annual Report. All projects listed here that receive direct funding require a project summary writeup in Volume II of the Annual Report/Renewal Proposal. Project abstracts are required for associated projects. All projects should also be represented during poster sessions at annual ERC site reviews.

Data provided here produce:

Table 2: Research Program Organization and Effort
Figure 2a: Research Project Investigators by Discipline
Table 8: Functional Budget,
Figure 8a: Functional Budget as a percentage of Direct Support
Figure 8b: Functional Budget as a percentage of Associated Project Support
Table 9: Sources of Support

8.2. INSTRUCTIONS

Data is entered here about the ERC research effort. There are two categories for data entry available under the Research Screen: Thrusts and Clusters, and Projects.

All individuals counted in this table should be included in the Demographics tab.

8.2.1. Add/Edit Thrusts and Clusters Data

Provide the following information for each Thrust:

Thrust Name
Thrust Leader
If the thrust leader's name is missing from the search results, the option to quick-add a personnel record for the thrust leader is available.
Cluster List for this Thrust—to add a new cluster to the list above please provide data on the last row and click on the **Save** button. Include the following:
Cluster Name
Cluster Leader
If the cluster leader's name is missing from the search results, the option to quick-add a personnel record for the cluster leader is available.
Estimated Next Year Budget Allocation
Number of Unique Projects

After you have entered this information, click on **Save.**

8.2.1.1.   Delete Thrusts and Clusters

This feature allows you to delete a Thrust. Any associated clusters must be deleted first before the Thrust can be deleted.

8.2.2. Add/Edit Projects Data

Provide the following information for each Project:

Project Name
Project Type (core (or Center-controlled) project, associated project, or sponsored project)
Organizational sponsor (for associated or sponsored projects only)
Indicate whether the project involves Translational Research
Indicate source of NSF Funding:
Directly funded by NSF (excluding ERC base award)
Indirectly funded by NSF (translational research only)
Not funded by NSF
Cluster List for this Project—to add a new cluster to the list above please provide data on the last row and click on the **Save** button. Include the following:
Cluster Name
Cluster Leader
If the cluster leader's name is missing from the search results, the option to quick-add a personnel record for the cluster leader is available.
Project's Current Year Budget Allocation per Cluster

After you have entered this information, click on **Save.**

8.2.2.1.   Delete Project

This feature allows you to delete a Project. Any personnel associated with the project will not be removed but they will no longer be associated with the project.

9. MONEY SCREEN

9.1. OVERVIEW

The data collected in this section relate to the types and sources of support to the ERC and ERC faculty, as well as prior-year expenditures and detailed functional current-year budgets.

Data provided here produce:

Table 8: Functional Budget
Figure 8a: Functional Budget as a percentage of Direct Support
Figure 8b: Functional Budget as a percentage of Associated Project Support
Table 9: Sources of Support
Table 10: Annual Expenditures and Budget

9.2. INSTRUCTIONS

Please provide information on types and sources of support to the ERC and ERC faculty, as well as information on expenditures and budgets. There are three categories for data entry available under the Money Screen: Academic Institutions Providing Support, Other Sources of Support, and Residual Funds Brought Forward.

Enter the amounts of Unrestricted Cash, Restricted Cash, Residual funds carried over from the previous year, Associated Project Support, and In-Kind Support for the following categories

Prior Award Year Actual
Received by End of Reporting Year
Promised by End of Award Year

These data are required for Table 9: Sources of Support of the Annual Report.

NOTE: Do not include any future-year projections in this table or amounts of support that the Center estimates it will receive later in the current year but cannot document.

9.2.1. Sources of Support

9.2.1.1. Sources for Unrestricted Cash Donations

The sources for Unrestricted Cash Donations are:

NSF ERC base award
U.S. industry

Foreign industry
State
U.S. University
Foreign university
Other NSF (not ERC Program)
Other U.S. Government (not NSF)
Foreign government
Other source

9.2.1.2. Sources for Restricted Cash Donations

The sources for Restricted Cash Donations are:

NSF ERC Program special purpose awards and supplements
U.S. industry
Foreign industry
State
U.S. University
Foreign university
Other NSF (not ERC Program)
Other U.S. Government (not NSF)
Foreign government
Other source

9.2.1.3. Sources for Associated Projects (direct costs only)

The sources for Associated Projects (direct costs only) are:

U.S. industry
Foreign industry
State
Other NSF (not ERC Program)
Other U.S. Government (not NSF)
Foreign government
Foreign university
Other source

9.2.1.4. Sources of Support—In-Kind

Enter the value of donations of new construction, equipment, new facilities, and other assets and the value of time spent by visiting personnel.

9.2.1.5.   Sources for Value of New Construction Donations

The sources for the value of new construction donations are:

U.S. industry
Foreign industry
State
U.S. University
Foreign university
Other NSF (not ERC Program)
Other U.S. Government (not NSF)
Foreign government
Other source

9.2.1.6.   Sources for Value of In-Kind Equipment Donations

The sources for the value of in-kind equipment donations are:

U.S. industry
Foreign industry
State
U.S. University
Foreign university
Other NSF (not ERC Program)
Other U.S. Government (not NSF)
Foreign government
Other source

9.2.1.7.   Sources for Value of New Facilities Donations in Existing Buildings

The sources for the value of new facilities donations in existing buildings are:

U.S. industry
Foreign industry
State
U.S. University
Foreign university
Other NSF (not ERC Program)
Other U.S. Government (not NSF)
Foreign government
Other source

9.2.1.8.   Sources for Value of Visiting Personnel

The sources for the value of visiting personnel are:

U.S. industry
Foreign industry
State
U.S. University
Foreign university
Other U.S. Government (not NSF)
Foreign government
Other source

9.2.1.9.   Sources for Value of Other Assets Donated

The sources for the value of other assets donated are:

U.S. industry
Foreign industry
State
U.S. University
Foreign university
Other NSF (not ERC Program)
Other U.S. Government (not NSF)
Foreign government
Other source

9.2.1.10.   Sources for Residual Funds

The sources for residual funds are:

NSF ERC Program
U.S. industry
Foreign industry
State
U.S. University
Foreign university
Other NSF (not ERC Program)
Other U.S. Government (not NSF)
Foreign government
Other source

NOTE: When unrestricted or restricted cash awards are made in a lump sum and cover multiple years (e.g., $500,000 lump sum award to be used over 3 years), report the full amount of the award in the year in which the award was received—do not report any prorated amounts. While prorating is permissible from an accounting standpoint, reviewers and NSF Program Officers need to see full funding amounts. Enter the full amount of each award in either the unrestricted or restricted cash section of the table, as

appropriate. In the year(s) following receipt of the award, report on the residual funds line the amount from the original award not spent in the year in which the award was received or any subsequent year in which only part of the remaining funds from the original award was spent.

9.2.2. Functional and Educational Budget

Report the current-year budget for cash (using the basis established in table 10) according to the Center's function categories.

These data are required for Table 8: Current Award Year Functional Budget and Table 8c: Education Functional Budget

9.2.2.1. Research Thrusts/Testbeds

Enter amounts from Direct Sources of support and Associated Project support. For each research thrust include salaries; benefits; project-related equipment; project-related travel, and related research costs; and research-based outreach to other institutions. The research total entered here should equal the total current-year budget in Table 2: Estimated Budgets by Research Thrust and Cluster.

9.2.2.2. Budget Functions

9.2.2.2.1. Education

Enter amounts from Direct Sources of support and Associated Project support in the following categories:

- Pre-college Activities
- University Education
- Student Leadership Council
- Young Scholars
- REU
- RET
- Assessment
- Community College Activities
- Other

9.2.2.2.2. Other Budget Functions

Enter amounts from Direct Sources of support and Associated Project support in the following categories:

- General and Shared Equipment
- New Facilities/New Construction
- Leadership/Administration/Management
- Industrial Collaboration/Innovation Program
- Center-Related Travel
- Residual Funds Remaining
- Indirect Cost

9.2.3. Annual Expenditures and Budgets

For all the categories in this section, enter the actual expenditures for the prior Award Year and budget amounts for the Current Award Year. Also enter the proposed budget for the next Award Year. Cash from all sources that is managed by the Center is included here. No associated project funding is reported here.

The Current Award Year Budget column includes the amount that the Center plans to spend during the Current Award Year and should be reported based on the amount of support that has already been received during the Current Award Year, plus the amount brought over from the preceding year (residual), plus all amounts for which the Center has documentation that the support will be received before the end of the Current Award Year, such as an REU supplement award where funding is provided over a 3-year period based on performance.

These data are required for Table 10: Annual Expenditures and Budgets of the Annual Report.

Table 10 shows multiple years of data. The Current Award Year data are based on expected income and expenditures. ERCWeb automatically moves current-year data from a Center's last report to the prior Award Year expenditures column for the new report. On the data entry screens for these tables there is a column for prior-year actual that must be updated once the Award Year is finished in order to reflect the actual values received and spent. These completed data are considered actual data—they are based on actual dollar amounts expended or membership renewals received within that Award Year. Once prior-year data have been entered in ERCWeb, the database produces tables and conducts analyses with the full-year data exclusively. The partial-year data are archived but never used again. Data for ERCWeb-produced tables 4 and 11 are handled in a similar manner.

The Proposed Budget—Next Award Year column summarizes the Center's spending plan for the Proposed Award Year (the year for which the Center is requesting ERC Program support in the Annual Report). This column identifies the Center's plans for spending all expected cash, not just the ERC Program core support.

9.2.3.1. Salaries and Benefits

Provide the amounts of direct pay and fringe benefits paid from ERC funds to Center personnel in each category listed below. Some faculty researchers are also likely to have both leadership

and management responsibilities, so the cost of their time should be split between the appropriate categories (faculty salaries and administration/management salaries).

    A. Senior Personnel: PI/PD, Co-PIs, Faculty, and Other Senior Associates
    B. Other Personnel
        1. Postdoctoral Associates
        2. Other Professionals
        3. Graduate Students
        4. Undergraduate Students
        5. Secretary-Clerical
        6. Other
    C. Fringe Benefits

9.2.3.2. Other Expenses

Report all expenses other than salaries and benefits, including:

    D. Equipment (for items exceeding $5,000)
    E. Travel
    F. Participant Support
    G. Other Direct Costs:
        1. Materials and Supplies
        2. Publications/documentation/dissemination
        3. Consultant Services
        4. Computer Services
        5. Other

Also include Indirect Costs.

9.2.3.3. Residual Funds Remaining

The totals for the expenditures and budget columns should include an amount for any residual funds that will be carried forward into the next Award Year. Footnote all amounts by identifying amounts that are 1) forward funding or out-year funding for multiyear awards, 2) out-year industry membership fees paid up front, or 3) remaining unexpended funds, independent of whether they are encumbered or obligated.

9.2.3.4. Prior Award Year Residual Funds Spent in Current Award Year

Report the amount of residual funds spent based on the source of those funds. These amounts are not included in the expenditures and budget totals in table 10 because it is assumed that the amounts reported for salaries and other expenses may already include residual funds carried forward from a prior year. It is not necessary to report how residual funds were spent, only that they were spent. Sources of residual funds are:

- ERC Program
- Other NSF
- Other Federal sources
- Industry
- Any other source

An explanation of the residual funding is required in the text box.

10. OUTPUTS AND IMPACT SCREEN

10.1. OVERVIEW

Quantifiable outputs include data on research, technology transfer, and educational outputs of the Center from its inception through the Current Reporting Year.

Data provided here produce:

- Table 1: Quantifiable Outputs
- Table 1a: Average Metrics Benchmarked Against All Active ERCs and the Center's Tech Sector and Class
- Table 3a: Educational Impact

10.2. INSTRUCTIONS

All counts are per Reporting Year. Please check glossary for definitions. NOTE: <u>Papers must already have appeared in print</u>, not just accepted for publication.

10.2.1. Quantifiable Outputs

In this section, please answer the following questions about quantifiable outputs.

Note: Paper should be reported either as Center supported, associated, or sponsored. The total of all three should equal all papers published. Within each of the sections, papers could potentially be double counted (for example, if a paper had multiple authors, multiple authors with industry, in a trade journal, and in a conference proceeding.)

1. Indicate the number of full-length papers that were published as a result of **Center support**. Choose one category only for each paper published during the reporting year**.**
   - In peer-reviewed technical journals
   - In peer-reviewed conference proceedings
   - In trade journals
   Indicate the multiple author status for each paper published during the reporting year. Choose every category that applies for each paper. If a trade journal article does not appropriately acknowledge NSF, it cannot be counted as a trade publication in Table 1.
     - Multiple authors
     - Multiple authors: co-authored with ERC students
     - Multiple authors: co-authored with industry
     - Multiple authors: with authors from multiple engineering disciplines
     - Multiple authors: with authors from both engineering and non-engineering fields
     - Multiple authors: with authors from multiple institutions

2. Indicate the number of publications resulting from **Associated Projects** and **Sponsored Projects** mentioned in the strategic plan. Choose one category only for each paper published during the reporting year.
   - In peer-reviewed technical journals
   - In peer-reviewed conference proceedings

3. Indicate numbers of **Inventions, Patents,** and **Spin-off Companies**:
   - Inventions disclosed (submitted to agencies by researchers or technology transfer office)
   - Patent applications filed
   - Patents awarded
   - Licenses issued
   - Spin-off companies started
   - Estimated spin-off company employees
   - Building codes impacts
   - Technology standards impacts
   - New surgical and other medical procedures adopted

4. Provide information on the **number of degrees granted to ERC students**:
   (NOTE: Count degrees, not number of students.)
   - Bachelor's degrees
   - Master's degrees
   - Doctoral degrees

5. Indicate **number of ERC graduates, by type of degree, hired by**:
   - ERC member firms
   - Other U.S. industry
   - Other foreign industry
   - Government
   - Academic institutions
   - Other
   - Undecided/still looking/unknown

6. Quantify the **ERC's influence on curriculum**. Provide numbers of:
   NOTE: New degree programs, minors, or certificate programs should be reported only in the first year in which the sequence of courses 1) is offered in its entirety and 2) has obtained official university clearance to be offered for credit.
   - New courses based on ERC research that have been approved by the curriculum committee and are currently offered
   - Currently offered, on-going courses with ERC content
   - New textbooks based on ERC research
   - New textbook chapters based on ERC research
   - Free-standing course modules or instructional CD-ROMs based on ERC research
   - New full degree programs based on ERC research
   - New degree minors or minor emphases based on ERC research
   - New certificate programs based on ERC research

For Full-degree programs:

- Number of students enrolled in any full-degree programs based on ERC research during this reporting period
- Number of students graduated from any full-degree programs based on ERC research during this reporting period

For Certificate programs:

- Number of students enrolled in certificate programs based on ERC research during this reporting period
- Number of students graduated from certificate programs based on ERC research during this reporting period

7. Quantify **Information Dissemination/Educational Outreach** activities. Indicate numbers of:

- Workshops, Short Courses, and Webinars:
    - Number of participants that attended activity
- Innovation-focused Workshops, Short courses, Webinars, and Seminars: (These should only be counted as "Innovation-focused" if the primary focus is innovation and should not be counted in the Workshops, short courses, and Webinars if it is counted in this field.)
    - Number of Participants that attended the activity
- Seminars, Colloquia, Invited Talks, etc.
- ERC-sponsored educational outreach events for K–12 students:
    - Number of students that attended activity
    - Number of teachers/faculty that attended activity
- ERC-sponsored educational outreach events for community college or undergraduate students:
    - Number of students that attended activity
    - Number of teachers/faculty that attended activity

8. **Quantify personnel exchanges. Indicate numbers of:**

- Student internships in industry
- Faculty working at member firm
- Member-firm personnel working at ERC

10.2.2. Educational Impact

Additional breakdowns of the data provided on the number of new courses currently offered; currently offered, ongoing courses with ERC content; workshops, short courses, or Webinars;

and new textbooks based on ERC research are requested. For each of these four output types you are asked to provide a breakdown to show how these items fit into the following categories:

- With an engineered systems focus
- With multidisciplinary content
- Team taught by faculty from more than one department
- Undergraduate level
- Graduate level
- Used at more than one ERC institution

For example, you are required to categorize the count of new courses based on ERC research that are currently offered to show how many of these courses had an engineered system focus, multidisciplinary content, and other characteristics. Please note that a single course may fall under several categories.

11. GLOSSARY

Administrative Director—Non-research individual who is responsible for the general operation of the Center. Generally performs in the role of an executive officer or chief operating officer for the Center. The Administrative Director is part of the Center leadership team.

Affiliate institutions—Academic institutions that provide one or two affiliated faculty to support the center's research.

Alliances for Graduate Education and the Professoriate (AGEP)—NSF funds the AGEP program. The primary goals of AGEP are to 1) significantly increase the number of underrepresented minorities (i.e., African Americans, Hispanics, American Indians, Alaska Natives, and Native Hawaiians or other Pacific Islanders) obtaining graduate degrees in science, technology, engineering, and mathematics and 2) enhance the preparation of underrepresented minorities for faculty positions in academia.

Associated project—A project that is central to either the research strategic plan or education strategic plan that is awarded to the home department of an ERC faculty member. Associated project funds are not controlled by the Center and are reported as indirect sources of support. Only direct costs for these projects should be reported (no indirect costs or reserves remaining).

For associated projects whose funding is part of a larger award that includes faculty outside the Center, include only the funding percentage that is directly in support of the Center's strategic plan or vision. It should be documented how this prorating was calculated.

Award Year—A 12-month period that begins on the date that the ERC first receives NSF funding. The Award Year start and end dates remain constant throughout the life of the Center.

Base location or headquarters—Organization's main headquarters location. Choices include:

> **Domestic**—Organization's main headquarters is in the United States or U.S. territories.
> **Foreign**—Organization's main headquarters is in a foreign country.

Center-related travel—All Center-level travel expenses incurred by ERC personnel (individuals reported in Table 7: ERC Personnel) and supported by funds controlled by the Center. The amount in this category is reported in Table 10: Annual Expenditures and Budgets in the General Operating Expenses portion of the Current Year Budget column. Project-level travel and REU travel expenses are not included here, but rather under the research expense category.

Cluster—A collection of smaller projects within a thrust that, as a group, address a particular technology need of the Center. Clusters should involve several personnel from different backgrounds, as appropriate to the goal(s), working together to solve a common problem.

Collaborating (outreach) academic institutions—Academic institutions that carry out focused research or curriculum development-related activities for the ERC. In some cases, ERC funds are provided to the organizations, faculty members, or students. Funds go to the collaborating

institutions through a transfer (subaward) from the lead institution. In other cases, no ERC funds are provided, and the personnel from the collaborating institutions use their own funds and work primarily at their own institutions with their facilities. Personnel from such organizations typically work at their own site in an outreach relationship with the Center but may spend short periods (2 or 3 days) at the Center. Such visits to the Center are not considered in-kind personnel support to the ERC.

Contributing Organization—Organizations that are neither members nor funders of associated or sponsored projects but provide non-project-specific support to the ERC through grants, equipment, or other real donations. The dollar value of this support is reported in Table 9: Sources of Support.

Core partner institution—Lead and core partner institutions function as an integrated whole with shared research and education goals, shared elements of the curriculums, and a shared program of industrial collaboration. The lead university accepts the overall management and financial responsibility for the Center.

Core project (or Center-controlled project)—Projects that are supported with Center-level funds from NSF and possibly other unrestricted funds under the Center's control and in a Center account. These sources are reported in Table 9: Sources of Support. For reporting purposes, individual projects should be grouped together into clusters that have multiple faculty members and a substantial budget.

Core support—All unrestricted cash provided to the Center. The ERC Program's base funding provides most but not all of a Center's core support.

Current Award Year—Award Year during which a given Annual Report is submitted to NSF

Current Award Year budget—Direct costs of conducting ERC research, e.g., salaries, fringe benefits, project-related equipment, project-related travel, related research costs, and REU costs, including student travel. The amount the Center plans to spend during the Current Award Year should be reported based on the amount of support that has already been received within the Current Award Year, plus the amount brought over from the preceding year (residual), plus all amounts for which the Center has documentation that the support will be received before the end of the Current Award Year, such as an REU supplement award where funding is provided over a 3-year period based on performance.

The sum of the funding for all Current Year projects (i.e., support for Center-controlled, sponsored, and associated projects) should equal the research total in the Total column of Table 8: Functional Budget. Similarly, the sum of the Current Year projects in each thrust or cluster in table 2 should be the same as the subtotal for that thrust table 8.

Curriculum development and outreach—This classification applies when personnel are working on curriculum development and outreach only, not research.

Degrees to ERC students—Number of degrees awarded to ERC students, not number of people receiving them. Counting of multiple degrees earned by the same student is allowed. Only ERC students may be included in these counts. At a minimum, an ERC student is involved in ERC research full time for a summer (3 months) or the equivalent on a part-time basis. Individuals whose degrees are included here must have been reported previously as ERC students, unless the participation in ERC research took place within the last 12 months.

Direct costs—Costs readily identifiable and related directly to the good or service provided. Examples include salaries (including tuition remission), fringe benefits, general operating expenses such as materials and supplies, travel, facilities, and equipment.

Direct sources of support—Funding provided to the Center and kept in a Center account. The support may come with no specifications regarding its use. This is known as "Unrestricted Cash" and funds Center-controlled projects. Alternatively, the sponsor providing support to the Center may have specified the use of these funds. This type of support is known as "Restricted Cash" and is used to support sponsored projects.

Director(s)—The Center director and deputy or associate directors are included in this category, even if they perform other roles.

Disciplines involved—Each faculty member's Ph.D. field or field of other highest degree

Doctoral students—Research assistants, fellows, and co-op students involved in ERC work who are enrolled in a Ph.D. program at lead, core partner, or outreach institutions receiving project support from the ERC. Doctoral students are involved in core or associated projects or the Center's curriculum development and outreach programs. They may receive funding from a non-ERC source such as a fellowship or scholarship.

Education Director—The individual(s) responsible for the Center's education/outreach program. Examples of activities include course or degree program development, practitioner training, and outreach to students and faculty outside the ERC universities, especially minority institutions, community colleges, and pre-college schools.

Education programs—Examples of costs for education programs include fellowships, course development, education director and staff salaries, and education/outreach and university collaboration activities. Additional examples include developing and using student assessment instruments, methods for evaluating the quality and utility of education modules, software, and formal dissemination of the Center's educational products through training others in the broader engineering education community beyond the Center and ERC Program.

Additional Notes for Table 8c, Education Functional Budget
- o Pre-College Education Activities: Includes staff salary, but does not include REU or RET budgets
- o University Education: Includes curriculum development activities; seminars and workshops by ERC personnel; should not include REU or RET travel to present a research paper. Education budget items may include travel to conferences for the purpose

of outreach or recruitment or to support a student who is not presenting a paper. Tuition remission should be in the research budget, not education. Similarly, REU and/or RET travel to present a research paper should be in research budget.

- o Student Leadership Council: SLC budget should be that amount controlled by the SLC itself. SLC time should include: organizing SLC meetings, SWOT for Site Team Visits, running seminar series, SLC social events.
- o Young Scholars: Required for Gen-3; should be included for other Centers with Young Scholar Program as defined in the ERC Reporting Guidelines.
- o REU/RET: Should include student mentoring (REU); travel costs, housing, meals, etc. REU budget should not be included in Pre-College Activities. Minimum of $42K each must be allocated for REU and RET programs, without overhead.
- o Assessment: Should include staff time spent on evaluation and assessment as well as subcontractor and outside evaluator time, and topic-specific materials.
- o Community College Activities: If applicable for any ERC. Community College faculty RET participants should not be included here.
- o Other: Can include Continuing Education and Informal Education, Time Spent with Practitioners; should include anything that does not fit into other categories.

ERC faculty—Assistant, associate, or full professors at lead, core partner, affiliated, or outreach institutions working on core or associated projects. ERC faculty are members of the ERC team who manage, lead, and/or carry out the ERC's research, education, technology transfer, and outreach activities, regardless of whether they are paid by these projects. There are no minimum time requirements for this involvement.

ERC graduates hired by—Post-degree employer for each individual included in the counts for degrees to ERC students. Categories of employer are:

ERC member firms
Other U.S. industry
Other foreign industry—Private-sector firms whose main headquarters is not in the United States or U.S. territories, even if the firm has a substantial U.S. presence
Government
Academic institutions
Other
Undecided/still looking/unknown

NOTE: For graduates working at Federal laboratories (e.g., Sandia National Laboratories or Jet Propulsion Laboratory), it is important to accurately report which individuals are employees of the Federal Government (e.g., the U.S. Department of Energy (DOE) or National Aeronautics and Space Administration in the cases above), as opposed to the contractor organizations that operate the laboratories (e.g., Lockheed Martin or the California Institute of Technology). In many cases, the graduates will be employees of the contractors (usually private-sector firms or universities), not the Federal Government. This is also true for graduates who work for consulting firms.

ERC participants—Individuals who are impacted by the core and outreach activities of the Center. They may be K–12 students, community college students or teachers, or individuals involved in ERC-sponsored workshops. No demographic data are collected for these individuals.

ERC personnel—Individuals who are directly involved in executing activities funded by the Center. They may be paid or unpaid. They may be engaged in leadership/administration, research, or curriculum development and outreach, or they may be REU students or industry researchers.

ERC project—Any distinct piece of work (e.g., research, education, technology transfer) within one of the Center's thrusts in the strategic plan. ERC projects may be funded by either direct or indirect sources and are classified as one of the following:

Core project (or Center-controlled project)
Associated project
Sponsored project

ERC Proposed Award Year—The Proposed Award Year is the Award Year following the Current Award Year.

ERC-sponsored educational outreach events for K–12, community college, or undergraduate students—An educational activity sponsored by the ERC and conducted by ERC personnel to disseminate knowledge about, generate interest in, or increase awareness of engineering in general and the ERC research in particular in K–12, community college, or undergraduate populations.

ERC student—Any student at the undergraduate or graduate level (master's and Ph.D.) enrolled in one of the Center's lead, core partner, affiliate or outreach institutions and working on core or associated projects. ERC students must be listed on at least one project in Volume II of the Annual Report/Renewal Proposal. They may be involved in ERC research, education, technology transfer, or outreach activities and may be paid or unpaid. There is no minimum time requirement for this involvement. ERC students are to be included in Table 7: ERC Personnel.

ERC's own REU funding—Undergraduates supported by funds that come neither from the NSF REU program nor the NSF ERC REU awards to ERCs for undergraduate involvement in Center research. Usually the funds come from discretionary sources within the ERC, the ERC's education/outreach programs, or from a mix of Center activities.

Ethnicity—For the purposes of this data collection, "Hispanic or Latino" is defined as a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race. Race data are collected separately from ethnicity. ("Hispanic or Latino" is considered an ethnicity rather than a race; Hispanic or Latino persons can be of any race.)

Expenditure—Reimbursed costs incurred in conjunction with ERC activities. These costs must be billed to the lead institution and covered by (i.e., paid out from) Center funds. Moving funds to another account, variously called "encumbering" or "obligating" ERC funds, does not

constitute an expenditure of funds. Unless charges are both billed to the lead institution and reimbursed with funds from a Center account, no expenditure has taken place. The definition of "expenditure" is crucial to accurate reporting for tables 9 and 10. Costs incurred by Center personnel on behalf of Center activities are billed to the lead institution's Center accounts and then reimbursed with funds controlled by the Center. The reimbursement of costs incurred is the actual expenditure, not the act of incurring costs or the act of billing them to the lead institution's Center account. If costs have been incurred, but no Center funds have been released to cover the incurred costs, there has been no expenditure. Thus, Center funds that have been encumbered or obligated (i.e., funds made available for a core partner or other subawardee to spend) have not been expended until the other party has incurred costs, billed them back to the Center, and been reimbursed.

Expenses—Cost categories in which the Center previously spent cash (in all completed Award Years) or plans to spend cash (in the Current Award Year and following Award Year)

Federal fiscal year—The Federal fiscal year begins on October 1 and ends on September 30.

Foreign partner institution—An academic institution not based in the United States that has a partnership agreement with the ERC to conduct collaborative and/or complementary research in support of the ERC's vision and goals. The ERC will not provide NSF funds to a foreign partner; the foreign institution or government is expected to provide the funds for the work of the foreign partner institution. Foreign students (not a U.S. citizen or permanent resident) matriculated in U.S. degree programs or on a postdoctoral appointment or foreign faculty serving on a visiting faculty appointment to the lead or one of the U.S. partner universities may be supported by U.S. funds. However, REU funds may not be used to support foreign students.

Freestanding course modules or instructional CD-ROMs based on ERC research—Modules or CD-ROMs containing components of ERC courses that may be used in settings other than those for which they were originally designed

Fringe benefits—All non-salary compensation, including health insurance, retirement, and related benefits, provided to ERC personnel out of ERC funds

Function—The Center's operational domains (usually thrusts) that can incur costs

Funders of associated project— Organizations that support awards made directly to Center faculty, not the Center. The funding goes to the PI's department and the projects (or parts of the projects) support the Center's strategic plan.

General and shared equipment—Equipment that benefits the entire ERC

Indirect costs—Also referred to as "overhead" or "facilities and administrative costs." Typically this is the overhead cost charged to a grant or contract by the sponsored program's office.

Indirect sources of support—Funding to an ERC faculty member's department for a project that is vital to the ERC's research and is in its strategic research or education plan. These projects

are called "associated projects." Only direct costs for associated projects should be reported (no indirect costs or reserves remaining). Indirect support is reported at the project level in tables 2 and 11 and collectively in table 9.

Industrial/practitioner member—An organization that satisfies all requirements for membership according to the Center's membership agreement and cooperative agreement. Organizations must sign a membership agreement and provide a sufficient level of financial support (cash or in-kind) according to the Center's membership agreement during the Reporting Year. Centers may define different levels of membership. One exception is that a signed membership agreement is not required for members in a government sector. Sectors include the Federal Government, State government, local government, quasi-government research, industry, industry association, medical facility, private foundation, nonprofit, consulting firm, or other. The total amount of cash or in-kind support provided by members is reported in Table 9: Sources of Support.

Industrial Liaison Officer— The individual fosters industrial/practitioner collaboration, recruiting and retaining the Industrial Advisory Board members, and develops the optimum strategy for managing the ERC's intellectual property. In addition, Gen-3 ILO's facilitate the translation of the ERC's technology to use in the commercial marketplace or within government and assist the Education Director in creating a culture of entrepreneurship and innovation among the ERC team members.

Industry researchers—Researchers employed by industry who visit the Center (no time minimum) and are involved with ERC research and/or outreach projects

Innovation—The introduction of new or significantly improved products (goods or services), processes, organizational methods, and marketing methods in internal business practices or the marketplace.

Innovation-focused Workshops, Short courses, Webinars, and Seminars—Workshops, short courses, webinars or seminars sponsored by the center that focus on innovation topics such as ways to speed the translation of center knowledge and discoveries into use, or to educate students and faculty about innovation and entrepreneurship. This could include a meeting of students and faculty with IAB members to discuss innovation opportunities, a meeting with an invited outside speaker to train the center personnel on innovation, a meeting where center personnel share their experiences with innovation opportunities with other faculty, students, or industry, etc.

Innovation partner—Organization participating in the ERC with a mission to stimulate entrepreneurship and innovation

Institution with predominantly female students—Institutions whose female student body population greatly exceeds that of an education system in which both men and women attend the same institution

Institution with large numbers of underrepresented minority students in Engineering--Institutions whose underrepresented minority student population in Engineering comprises at

least 25% of the total undergraduate enrollment, but does not fit any of the Federally-recognized categories of institutions serving minority students.

Interdisciplinary research—Interdisciplinary research is a mode of research by teams or individuals that integrates information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines or bodies of specialized knowledge to advance fundamental understanding or to solve problems whose solutions are beyond the scope of a single discipline or field of research practice.[1] (The term "cross-disciplinary research" has also been used in the ERC program with the same meaning as interdisciplinary research.)

Inventions disclosed—Inventions that have been disclosed to NSF or other relevant Government agencies by the university technology transfer offices or by the project principal investigator during the Reporting Year. Instructions for when and how to file disclosures are provided in the NSF Grant Proposal Guide (http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg). The agencies must be formally notified of the intent to file for intellectual property protection, and the Center should have the number issued for each invention disclosure on file for auditing purposes.

Junior faculty—Assistant professors at lead, core partner, affiliate or outreach institutions working on core or associated projects. Junior faculty are members of the ERC team who carry out, manage, and/or lead the ERC's research, education, technology transfer, and outreach activities, regardless of whether they are paid by these projects. There is no minimum time requirement for this involvement.

Louis Stokes Alliances for Minority Participation (LSAMP)—NSF's LSAMP program is a comprehensive, multidisciplinary undergraduate program designed to substantially increase the quantity and quality of students, especially African American, Hispanic, and Native American students, pursuing degrees and careers in science, technology, engineering, and mathematics.

Lead institution—Lead and core partner institutions function as an integrated whole with shared research and education goals, shared elements of the curricula, and a shared program of industrial collaboration. The lead university accepts the overall management and financial responsibility for the Center.

Leadership/administration/management—The portion of salaries of the director, deputy director, associate director(s), thrust leaders, and administrative manager spent in leading and managing the Center as a whole. When individuals such as the director and deputy director(s) are partially funded by research funds, only their salaries for leadership and management are included in this category.

Leadership team—Director, deputy director, thrust leaders, education program leader(s), industrial liaison officer, administrative director, and any other Center-appointed management

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[1] Committee on Facilitating Interdisciplinary Research, National Academy of Sciences, National Academy of Engineering, Institute of Medicine. 2004. *Facilitating Interdisciplinary Research.* Washington, DC: The National Academies Press, 26.

positions such as associate director (e.g., associate director of research, associate director of strategic planning)

Licenses issued—Formal licensing agreements in which organizations pay the university for exclusive or limited access to Center intellectual property. Generally patents are licensed, but other types of intellectual property may also be licensed, including software licenses.

Master's students—Research assistants, fellows, and co-op students involved in ERC work who are enrolled in a master's degree program at a lead, core partner, affiliate or outreach institution receiving project support from the ERC. Master's students may be involved in research in core or associated projects or the Center's curriculum development and outreach programs. They may be paid or unpaid and may receive funding from a non-ERC source (e.g., a graduate fellowship or scholarship).

Multidisciplinary research—Multidisciplinary research is research involving more than a single discipline in which each discipline makes a separate contribution. Investigators may share facilities and research approaches while working separately on distinct aspects of a problem.[2]

NSF personnel type by classification—

Classification	Personnel Type
Leadership/Administration	Directors
	Thrust Leaders
	Research Thrust Management and Strategic Planning
	Industrial Liaison Officer (ILO)
	Education Program Leaders
	Administrative Director
	Staff
Research Under Strategic Research Plan	Senior Faculty
	Junior Faculty
	Research Staff
	Visiting Faculty
	Industry Researchers
	Postdocs
	Doctoral Students
	Master's Students
	Undergraduate Students
	Other Visiting College Students
Curriculum Development and Educational Outreach Under Strategic Education Plan	Senior Faculty
	Junior Faculty

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[2] Committee on Facilitating Interdisciplinary Research, National Academy of Sciences, National Academy of Engineering, Institute of Medicine. 2004. *Facilitating Interdisciplinary Research.* Washington, DC: The National Academies Press, 27.

Classification	Personnel Type
	Research Staff
	Visiting Faculty
	Industry Researchers
	Postdocs
	Doctoral Students
	Master's Students
	Undergraduate Students
	Other Visiting College Students
ERC REU Student	NSF REU Site Award
	ERC's Own REU
Pre-College (K–12)	Teachers (RET)
	Teachers (non-RET)

New facilities/new construction—Planned expenditures for major renovation relating to the installation of new facilities, construction of a new building, or the addition to a building with Center-controlled funds. If the sponsor is expected to fund and manage the construction or renovation rather than give the Center cash to do so, this is considered in-kind support.

Non-ERC institutions providing REU students—Institutions in which the Center's REU supplement students are enrolled, excluding the Center's lead and core partners. The sole involvement with the Center is to provide REU students. In many cases these institutions serve minority populations.

NSF Diversity Program awardees—Institutions where there is a formal arrangement between the Center and one or more awardees in NSF's minority postsecondary capacity-building programs. LSAMP and AGEP are two such programs. The alliance's lead institution is responsible for the collaboration with the ERC. The Center and each alliance use funds to support their own costs stemming from collaborative activities with the ERC, as part of the Center's diversity strategic plan. In some cases the alliance's lead institution becomes a core partner of the ERC.

NSF Diversity Alliances—Collaborations including LSAMP and AGEP, for example.

NSF ERC base award—Funds provided annually by the ERC Program

NSF ERC Program—The program within NSF that is responsible for funding and oversight of the ERCs. The NSF ERC Program provides the Center's core support each year upon successful review by NSF ERC Program site visit teams. The NSF ERC Program may also provide supplements to the Center's base award for specific activities and, occasionally, separate awards for specific projects. Funding from the NSF ERC Program is separate from funding provided to the Center by any other program in NSF's Directorate for Engineering (ENG) or in other directorates of NSF and must be reported separately from funding from all other NSF programs.

NSF ERC Program special-purpose awards and supplements—Awards made either as supplements to the ERC base award or as freestanding awards to the Center or Center faculty by

the ERC Program for special-purpose projects such as outreach, education, connectivity projects, or equipment purchases

NSF REU site award—Undergraduates supported by NSF's agencywide REU site activity. A proposal is submitted in response to the NSF-wide program announcement for REU sites and supplements.

Other visiting college students—Students at institutions other than lead, core partner, affiliate or outreach institutions who carry out research at the Center or work on collaborative projects. Their institution receives no support from the Center (no cash is exchanged), and there is no minimum time requirement for this involvement.

Patent applications filed—Patent applications filed by the university or a member organization for protection of specific ERC technology in the Reporting Year with either the U.S. Patent and Trademark Office or the European equivalent. The Center should be able to document the applications included in the count in case of an audit.

Patents awarded—Patents awarded to patent applications previously filed with the U.S. Patent and Trademark Office or the European equivalent. The Center should have the patent numbers issued by the relevant patent-granting body as documentation of the count in case of an audit.

Personnel exchanges—There are four types of personnel exchanges:

Student internships in industry
Faculty working at a member firm
Member-firm personnel working at the ERC
Students or faculty working at an ERC partner institution

The time period is at least 1 month during the Reporting Year. Generally, a personnel exchange focuses on a particular project. Provide a count of the number of each type of exchange, not the number of people involved or the number of trips from site to site that an exchange participant makes. If an exchange involves more than 1 month in residence at the other site, count it as a single exchange. In the event that one project/exchange has ended and a second exchange is later initiated between the same parties, generally on a somewhat different topic or project, the follow-on exchange may be counted separately from the first exchange.

NOTE:

A student counted here must have been reported as an education program participant or as ERC personnel during the Reporting Year.
A faculty member counted here must have been reported as ERC personnel during the Reporting Year.
An employee of a member firm counted here must have been employed at a firm that is counted as a member during the current Reporting Year.

Pre-college partners—Schools with teachers and/or students receiving ERC funds and those participating in the Young Scholars program

Postdocs—Researchers with recent doctoral degrees, usually in 1- or 2-year research positions at the Center, whose involvement is viewed as a continuation of their education. Included are individuals from lead, core partner, affiliate or outreach institutions working on core or associated projects or the Center's curriculum development and outreach programs. If the Center employs a postdoc, there MUST be a statement of mentoring activities in the Annual Report.

Practitioner—Agencies and other non-industrial organizations that use or could use the results of the ERC's research and employ its graduates

Project—The smallest unit of work, supporting one or two faculty and one or two students on a very focused piece of work. The Center should be organized such that projects are grouped together synergistically into clusters and these are grouped into thrusts.

 Proposed budget—The amount (direct costs only) that the Center proposes to spend in the next Award Year on a Center project. The spending plan is for all expected cash, not only the ERC Program core support.

Publications that result from associated projects—Full-length papers contained in peer – reviewed technical journals, peer reviewed conference proceedings or in trade journals. Each publication may be counted in only one of these three categories. Do not include abstracts or listings of presentations by Center staff contained in conference proceedings if a full technical article is not also present. Do not include documents that are in draft form, in review, in press, or any other pre-publication state. Each publication must be in print and must have been published during the Reporting Year. Choose all the categories that apply for Multiple Author Status. Publications counted here are a result of associated projects receiving indirect support.

Publications that result from Center support— Full-length papers contained in peer – reviewed technical journals, peer reviewed conference proceedings or in trade journals. Each publication may be counted in only one of these three categories. Do not include abstracts or listings of presentations by Center staff contained in conference proceedings if a full technical article is not also present. Do not include documents that are in draft form, in review, in press, or any other pre-publication state. Each publication must be in print and must have been published during the Reporting Year. Choose all the categories that apply for Multiple Author Status. Publications counted here must be a result of core-funded or Center-controlled projects, and must acknowledge NSF support.

Race—Race data are collected separately from ethnicity. ("Hispanic or Latino" is considered an ethnicity rather than a race; Hispanic or Latino persons can be of any race.) The following categories were established by OMB (more information is available on the OMB Web site at http://www.whitehouse.gov/omb/bulletins/b00-02.html):

American Indian or Alaska Native—A person having origins in any of the original peoples of North and South America (including Central America) and who maintains tribal affiliation or community attachment

Asian—A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent, including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam

Black or African American—A person having origins in any of the black racial groups of Africa

Native Hawaiian or Other Pacific Islander—A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands

White—A person having origins in any of the original peoples of Europe, the Middle East, or North Africa

More than one race reported, non-minority—Personnel reporting a) both White and Asian and b) no other categories in addition to White and Asian

More than one race reported, minority—Personnel reporting a) two or more race categories and b) one or more of the reported categories includes American Indian or Alaska Native, Black or African American, or Native Hawaiian or Other Pacific Islander

Reporting Year—A 12-month period established by the timing of the annual site review as follows: the Annual Report is due to NSF 5 weeks before the date of the site review. The Reporting Year end date is set by the Center and is no more than 2 months before the NSF due date (in other words, no more than 2 months and 5 weeks prior to the site visit date). This ensures that all the data are recent. Once the Reporting Year has been set, it remains constant throughout the life of the Center and covers 12 months of data. (There is an exception to this rule for some of the Class of 2006.)

Research Experiences for Teachers (RET) in Engineering program—This program supports the active involvement of K–12 teachers and community college faculty in engineering research in order to bring knowledge of engineering and technological innovation into their classrooms. The goal is to help build long-term collaborative partnerships between K–12 science, technology, engineering, and mathematics teachers; community college faculty; and the NSF university research community by involving the teachers in engineering research and helping them translate their research experiences and new knowledge of engineering into classroom activities. Partnerships with inner-city schools or other high-need schools are especially encouraged, as is participation by underrepresented minorities, women, and persons with disabilities.

Research Experiences for Undergraduates (REU) program—This program supports active research participation by undergraduate students in any of the areas of research funded by NSF. REU projects involve students in meaningful ways in ongoing research programs or in research projects specifically designed for the REU program. There are two mechanisms for the support of student research:

REU sites based on independent proposals to initiate and conduct projects that engage a number of students in research. REU Sites may be based in a single discipline or academic department or be interdisciplinary or multidepartment research opportunities with a coherent intellectual theme.

REU supplements for ongoing NSF-funded research projects or included as a component of proposals for new or renewal NSF grants or cooperative agreements

Undergraduate student participants in either REU sites or supplements must be citizens or permanent residents of the United States or its territories. Undergraduate students are considered to be affiliated with the institution at which they are matriculating rather than at the institution where they participate in an REU.

REU students—Undergraduate students who are only involved in REU program activities at the Center. REU students are reported separately from other undergraduate students involved with ERC projects or associated projects in the Demographics tab. Students are affiliated with the institution at which they are matriculating, rather than with the institution where they participate in an REU.

Research staff—Those without academic rank who perform or assist with ERC research, including research scientists and technical research staff but not postdoctoral fellows or industrial researchers

Residual—Cash (unrestricted and restricted) not spent in a previous Award Year that is brought forward to the next Award Year. Residuals include cash in Center accounts, forward funding, out-year commitments, and obligated subcontract funding that has not been billed back to the Center. Residual is the cash remaining in Center accounts after covering all costs (i.e., expending ERC funds by the lead institution to cover Center activity costs). Generally residuals are restricted to 20 percent of the NSF award for the Reporting Year. If the percentage is higher, the financial management section should include an explanation regarding why it is higher and a spend-down plan for the next year. Centers should guard against having large annual unexpended balances of unrestricted funds from the base NSF ERC Program award. This gives the impression that the ERC does not need a full year's increment the following year, which may lead to a reduction in the following year's ERC Program award. It is crucial that all ERC staff involved in managing the Center's accounts and spending Center funds understand that expended funds are not synonymous with encumbered or obligated funds (as explained in the expenditure definition) when calculating the unexpended residual in order to report it properly according to the terms of each Center's cooperative agreement in the Annual Report or Renewal Proposal. Cash from NSF may be carried over only to the year following the year in which it was received and must be spent in that second year. Funds from other Federal agencies may have different residual requirements. Cash from industry or other non-Federal sources not spent in the year received may be put in reserve in a Center bank account for future use 1 or more years after it was received. Residual funds from Federal sources may not be put in bank accounts.

Sector of organization—The economic sector to which the organization belongs. The choices include:

- Federal Government—U.S. Government (e.g., U.S. Department of Defense agency or facility, DOE laboratory, the National Institutes of Health (NIH))
- Foreign government agency (e.g., France's Centre National de la Recherche Scientifique, a United Kingdom Research Council, Germany's Deutsche Forschungsgemeinschaft)

- State government
- Local government
- Quasi-governmental research organization—Usually in a foreign country. Receives assured funding from a national government agency or ministry (e.g., the Fraunhofer Institute, the Max Planck Institute). Sometimes linked to a university.
- Industry—Private sector, for-profit organization or a nonprofit consortium of private-sector firms that supports research and other activities to benefit these firms (e.g., the Semiconductor Research Corporation (SRC))
- Industry Association—A trade association, not a research consortium
- Medical Facility—Hospital or independent medical research organization
- Private Foundation—Examples include Carnegie, Sloan, and Whitaker
- Nonprofit—Professional societies and associations such as SRI International
- Consulting firm—Firm in the private sector whose primary focus is providing technical or managerial support, advice, or training to other firms, universities, or government agencies
- Venture Capitalist—One who provides financial capital to early-stage, high-potential, high risk, growth start-up companies
- Other sectors—Not covered by the above sectors

Seminars, colloquia, invited talks, etc.—These are presentations given by ERC personnel to interested parties to disseminate information about ERC research and, in some cases, to receive feedback or elicit discussions about the research. The ERC should report the number of these events but not the number of participants.

Senior faculty—Associate or full professors at lead, core partner, affiliate or outreach institutions working on core or associated projects. Senior faculty are members of the ERC team who manage, lead, and/or carry out the ERC's research, education, technology transfer, and outreach activities, regardless of whether they are paid by these projects. There is no minimum time requirement for this involvement.

Size of industrial firm—Each private-sector, for-profit industrial firm is classified by the number of employees (U.S. Department of Commerce definitions):

Small—Fewer than 500 employees
Medium—500–1,000 employees
Large—More than 1,000 employees

Sources of support

 NSF ERC base award—Funds provided annually by the ERC Program

 NSF ERC Program special purpose awards and supplements—Awards made either as supplements to the ERC base award or as freestanding awards to the Center or Center faculty by the ERC Program for special purpose projects such as outreach, education, connectivity projects, or equipment purchases

U.S. industry—Unrestricted cash provided by a private-sector for-profit firm, a nonprofit industry research consortium (e.g., SRC), or an industry trade association for core financial support of the Center

Restricted cash donations are funds provided directly to the Center from U.S. industries for a designated purpose. Examples include sponsored research, technology transfer, and education projects, and funding can be provided by private-sector for-profit firms, nonprofit industry research consortiums, or industry trade associations.

Associated project funds provided to an ERC faculty member's department by a private-sector for-profit firm, a nonprofit industry research consortium, or by an industry trade association do not go directly to the Center and are for a specified associated project.

Restricted or associated project funds provided for specific work from professional societies and associations such as the Institute of Electrical and Electronics Engineers (IEEE), American Society for Engineering Education (ASEE), and American Institute of Chemical Engineers (AIChE) should be classified as "Other."

Foreign industry—Unrestricted cash provided for core financial support of the Center by a private-sector for-profit firm whose main headquarters is in a foreign country. For restricted cash donations, report funds provided directly to the Center for a designated purpose by private-sector for-profit firms whose main headquarters is in a foreign country.

Associated project funds provided to an ERC faculty member's department by a private-sector for-profit firm whose main headquarters is in a foreign country do not go directly to the Center and are for a specified associated project.

State—Unrestricted cash provided by a State government agency or State legislature for core financial support of the Center. The funds can be for membership in the Center or for direct operational support provided through a line item in the State's budget. This does not include general operational funds provided routinely by the State to lead and core partner institutions that are then made available to the Center at the institution's discretion. Funds from a local government agency may also be included.

For restricted cash donations, report funds provided directly to the Center for a designated purpose by a State government agency, State legislature, or local government. An example would be building construction. However, if the State finances the construction of a building for the Center and the funds are not under the Center's control, the cost of the construction is reported under "Value of New Buildings."

Associated project funds provided to an ERC faculty member's department by a State government agency, State legislature, or local government do not go directly to the Center and are for a specified associated project.

U.S. University— **Unrestricted** cash or lines of credit made available to the Center by one or more U.S. universities for core financial support of the Center.

For restricted cash donations, report cash or lines of credit that are under the control of the lead or core partner institutions. These funds are usually made available to the Center in the form of an account that the Center can spend down as needed. This type of restricted cash is often used as part of the Center's cost-sharing agreement with NSF.

Foreign university—Unrestricted funds for core financial support of the Center from a university whose headquarters is outside the United States and its territories.

For restricted cash donations, report funds provided directly to the Center for a specified purpose from a university whose headquarters is outside the United States and its territories.

Report foreign university partner projects that support the Center's strategic plan as associated projects.

There may be a campus or other facility in the United States.

Other NSF (not ERC Program)—Unrestricted funds for core financial support provided to the Center by an NSF program other than the ERC Program

Unrestricted cash donations include funds provided directly to the Center for a specified purpose from NSF programs other than the ERC Program.

Report associated project funds provided to an ERC faculty member's department for a specified purpose from NSF programs other than the ERC Program.

Examples of unrestricted or associated project funds include REU site awards or programs from other NSF directorates such as ENG, the Directorate for Education and Human Resources, or the Directorate for Mathematical and Physical Sciences.

Other U.S. Government (not NSF)—Unrestricted funds provided by a Federal agency other than NSF for core financial support of the Center. When reporting unrestricted cash donations, report funds provided directly to the Center for a specified purpose by a Federal agency other than NSF.

Report associated project funds provided to an ERC faculty member's department for a specified purpose by a Federal agency other than NSF. Examples include the Defense Advanced Research Projects Agency (DARPA), DOE, or NIH. These funds can also be provided by a Federal laboratory funded by a Federal agency or department and administered under contract by a university, university consortium, or nonprofit research organization. Examples include Jet Propulsion Laboratory, Lawrence Berkeley National Laboratory, Lawrence Livermore National Laboratory, and Oak Ridge National Laboratory. Funds may reach the Center or Center faculty member's department via interagency transfers in which NSF is the intermediary.

Foreign government—Unrestricted funds provided by a foreign government ministry, its programs, or its research laboratories for core financial support of the Center.

Restricted cash donations include funds provided directly to the Center for a specified purpose by a foreign government agency or research council. Associated project funds include those provided to an ERC faculty member's department for a specified purpose.

Other source—Unrestricted funds provided for core financial support of the Center or restricted funds provided directly to the Center or associated project. Also report funds provided to an ERC faculty member's department for a specified purpose by organizations such as medical facilities (hospitals or independent medical research organizations not run by the Federal Government and not part of a medical school), private foundations (e.g., Keck, Carnegie, Sloan, and Whitaker), foreign quasi-governmental research organizations (research organizations that receive assured funding from a national government agency or ministry source (e.g., Fraunhofer Institute, Max Planck Institute)), or an international research facility such as the European Organization for Nuclear Research. Some of these organizations may be linked to a university or university consortium. Also included here are professional societies and associations and nonprofit organizations that are not covered in any other category above, e.g., SRI International, IEEE, ASEE, and AIChE.

Spin-off companies—Firms started on the basis of the ERC's research/technology by faculty, students, or others

Sponsored project—Projects with a restricted or directed purpose that is specified by the funding source. Sponsored projects augment the Center's core activities. The award goes directly to the Center for a specific project and is classified as restricted cash. Examples of sponsored projects include REU supplements, DARPA awards to the Center, and industry-sponsored projects with clearly intended outcomes or activities.

Staff—Administrative, financial, contracts, database management, secretarial, and web personnel. Personnel working for or with the industrial liaison officer and education/outreach program leader also belong in this category.

Technology transfer activities (over the life of the membership)—These include:

Faculty onsite at the organization's location
Faculty-provided instruction to the organization
Individual from the organization on the lead institution campus
Licensed software
Licensed technology (other than software)
Graduate hired by the organization
Student onsite at the organization
Participation in Testbed
Other technology transfer activities (please explain)

Technology transfer/industrial collaboration—Costs for industrial meetings, technology transfer activities, the industrial liaison officer, and staff salaries

Thrust—A broad collection of clusters or projects with a common overarching goal or technical theme that supports the overall engineered systems vision of the Center.

Thrust leaders—Faculty members or other staff who are in charge of the Center's research thrusts

Translational research— Research that explores issues involved in moving a technology from the proof-of-concept stage through the early phases of product development and commercialization in collaboration with industry and funded by industry, NSF, or other source(s) external to the Center.

Types of direct sources of support—These include the following (NOTE: Report direct costs as well as indirect costs):

Cash support:

Unrestricted cash—Cash donations to the Center, which may be used for any purpose. Funding is kept in a Center account. Membership fees are one example and are reported in the Organizations and Academic Institutions tab. Unrestricted cash supports core (or Center-controlled) projects. Types of sources include:

NSF ERC base award
U.S. industry
Foreign industry
State
U.S. university
Foreign university
Other NSF (not ERC Program)
Other U.S. Government (not NSF)
Foreign government
Other source

Restricted cash—Cash given directly to the Center for a purpose specified by the funding source. These funds go to the ERC for distribution. Restricted cash supports sponsored projects only and may be used to fund a portion of the Center's research, education, or outreach programs; purchase specific equipment; pay for the construction of specific testbed experiments; renovate laboratories; or fund specific technology-transfer activities. (NOTE: Do not report associated project funding as restricted cash. This funding is reported as an indirect source of support.) Types of sources include:

NSF ERC Program special purpose awards and supplements
U.S. industry
Foreign industry
State
U.S. university
Foreign university

Other NSF (not ERC Program)
Other U.S. Government (not NSF)
Foreign government
Other source
In-kind support—All third party, non-NSF, non-cash contributions. Third party in-kind contributions may be in the form of real property, equipment, supplies and other expendable property, and the value of goods and services directly benefiting and specifically identifiable to the project or program. These need to be identified as new construction, equipment, new facilities in existing buildings, visiting personnel, or other.

Equipment, materials, or supplies
Personnel—Value of the time spent by researchers or educators at the Center for at least 1 month. The value of time spent by researchers working at their own facilities on joint projects with the Center or for a few days at the Center does not qualify as an in-kind personnel donation to the Center.

Other support—

Shared equipment or facilities—Examples include clean room and fabrication testbed
Other Assets (includes software)—Explain in the text box provided.

Types of involvement—These include:

Member of the Center's Industrial Advisory Board
Participation in science/engineering research projects
Participation in education and outreach activities
Participation in translational research

Innovation/Entrepreneurship
      Innovation/entrepreneurship training activities
      Provides incubation facilities
      Provides technology screening activities
      Provides connections to sources of commercialization funding

NOTE: Sponsors of associated projects have involvement in a Center only if they also provide direct support to the Center.

Types of support given by the Center—These include:

In-kind equipment
Material
Cash
ERC personnel

Undergraduate students—Research assistants involved in ERC research and enrolled in an undergraduate program at lead, core partner, affiliate or outreach institutions receiving project

support from the ERC. Undergraduate students may be involved in research in core or associated projects or in the Center's curriculum development and outreach programs. They may be paid or unpaid and may receive funding from a non-ERC source, e.g., an undergraduate fellowship or scholarship.

Value of in-kind equipment—The dollar value of all discrete equipment donated to the Center. If the Center was given the actual funds for purchase of the equipment, the amount should be reported as restricted cash rather than as in-kind. Valuations should be based on the actual cost to the institution of the item received were it to be purchased by the institution. This is not necessarily the market value. For example, State institutions require purchase of a wide range of equipment from approved vendors because of negotiated discounted prices. Report the discounted price, not the market price the Center would have paid to purchase the item. Do not include any equipment installed during the normal course of new building construction or new facilities installation.

Value of new construction—The construction cost of a new building or newly constructed addition to an existing building. This amount is reported only in the Award Year in which the building was first occupied by the Center. The value can be reported as an in-kind donation if the Center controlled the use of funds for construction, but not if the Center was given the actual funds for construction. If the Center was given the actual funds, the amount should be reported as restricted cash rather than as in-kind. The sponsor must intend that the space be for use primarily or in part by the Center. In order to include costs for equipment installed during construction, the installation must not be funded as a separate action. Do not amortize (spread out over several years) the cost. The source of new construction funding is usually a State government or industry. Do not include the value of any other research, instructional, or administrative space allocated for the Center's use by the lead or core partner institutions that the Center already occupies. Do not include the value of additional academic space in existing buildings that the universities allocated to the Center during any Award Year. Existing space or space in a new building that is made available to a Center by lead or core partner institutions is usually ineligible for inclusion.

Value of new facilities in existing buildings—The dollar value (i.e., cost of construction) of new facilities in existing buildings, such as a clean room or fabrication testbed, built expressly for or given to the Center by the sponsor. Report this amount only in the year in which the Center first occupied the new facility. The completed product is the donation. If funding was provided to the Center to fund construction of a facility, the amount should be reported as restricted cash rather than in-kind support. Also report the cost of any major renovation of a portion of existing Center space or space newly allocated to the Center. Such costs are usually borne by a university, State government, or industry. Exclude the costs of upgrading existing Center facilities.

Value of other assets—Occasionally a Center will receive an in-kind item whose monetary value can be established in a documentable way that fits in none of the other categories. Specify the nature of the support in a footnote.

Value of visiting personnel—Dollar value of non-ERC personnel working at the Center who are being paid by their employers. Personnel must be working in residence at the Center. The dollar

value should include all costs borne by employers while the employees are at the Center, including salary, fringe benefits, travel, and housing. These individuals are not members of the faculty or staff at either the lead or core partner institutions. Costs associated with employers sending employees to attend meetings or Center-sponsored workshops and seminars should not be included in the total value. Visiting personnel who attend such meetings while in residence will automatically have the value of the time they spend attending meetings included in the base value of their time in residence.

Visiting faculty—Faculty working on research (paid or unpaid) in ERC core or associated projects at the Center who are from academic institutions that are not lead, core partner, affiliate or outreach institutions. There is no minimum time requirement for this involvement.

Workshops, short courses, Webinars, etc.—These are short-term (a few hours to a few days) training events where ERC personnel transfer knowledge and insights based on ERC research to participants. The ERC should report the number of these events as well as the number of participants.

Young Scholar—A high school student participating in a paid internship with the ERC working on an ERC research project funded either by ERC direct funding or through an associated project