

**National Science Foundation  
Engineering Research Centers Program**

**Guidelines for ERCWeb Data Entry for the  
Engineering Research Centers  
FY2015**

**January 2015**

*prepared for*

**National Science Foundation  
Directorate for Engineering  
Division of Engineering Education and Centers**

*by*



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## 1. 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 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 International, Inc. ICF 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.

### 1.1. GETTING STARTED

The login page for ERCWeb is at <http://www.erc-reports.org/>. ERCWeb is currently managed by ICF. The ICF team consists of a project director, a project manager, 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. A toll-free phone number, (800) 981-2852, and an e-mail address, [support@erc-reports.org](mailto:support@erc-reports.org), have been set up exclusively for ERCWeb assistance and technical support. New Centers should contact ICF via phone or e-mail to receive access to the ERCWeb system.

The ERCWeb site includes the ERC Library, which 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. A link to the ERC Association Web site is also provided on the ERC Library page.

It is recommended that new Centers begin by reviewing the online tutorials developed by ICF staff to assist in learning how to navigate ERCWeb, both operationally and in terms of data entry. The tutorials can be found by selecting the ERC Library, Glossary, and Tutorials link from any page of the ERCWeb system and a login ID or password is not required. 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 the glossary of this document (see section 10). The required tables in the Annual Report are completed using data from various time periods.

### **1.1.1. 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. The ERCWeb system will automatically calculate an annual report due date as 5 weeks prior to 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.)

### **1.1.2. 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.

ERCWeb-produced tables 9, 10 and 11 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 system produces tables and conducts analyses with the full-year data exclusively. The partial-year data are archived but never used again.

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, the project budgets for the Current Year and the thrust or cluster Estimated Next Year Budget should include only direct research costs [e.g., salary, benefits, equipment, travel] and not overhead charges.)

## **1.2. SUBMITTING THE DATA**

Once all data have been collected and entered, the Center must submit these data officially through ERCWeb using the Final Submit button on the home 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 the ERCWeb technical support team with the approval of the NSF Program Director.

Before data are final submitted, the center should request their figures 6a-c. Maps can be requested as soon as the Institutions and Personnel sections are completed, but we suggest that you request your maps no later than 2 weeks prior to the annual report due date.

ERCWeb automatically compares data entered across different data entry sections for consistency and compliance with NSF validation rules. Error messages are displayed at the top of the data entry pages when inconsistencies are found. The Final Submit button on the home page is disabled until all the error messages are cleared.

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.

## 2. 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**—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, core partner, collaborating 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.

The summary section includes the Current Year Budget and Estimated Next Year Budget for each Thrust. The Current Year Budget section shows how the budget is allocated between Core Projects, Sponsored Projects, and Associated Projects and includes a Projects Total column.

**Figure 2a: Research Project Investigators, by Discipline**—Figure 2a is a pie chart 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 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 supporting organizations involved with the Center. The information includes the name of the organization, the organization sector, the product focus (industry only), the type of involvement, whether the firm is domestic or foreign, the size (industry only), the number of sponsored projects, and whether the organization is new.

The Section 6 Summary includes the total number of industrial/practitioner members, percentage of foreign members, and percentages by size (industry only).

**Table 4a: Organization Involvement in Innovation and Entrepreneurship Activities**—This table displays the types of activities and involvement by the Center’s supporting organizations, including:

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

**Table 5: Innovation Ecosystem Partners and Support, by Year**—This table provides numbers of Industrial/Practitioner members, Innovation Partners, Funders of Sponsored Projects, Funders of Associated Projects, and Contributing Organizations, listed by Reporting Year. Detailed information on dollar amounts for sponsored projects and the total dollar amount of industrial/practitioner member support provided to the Center are also provided.

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

- Faculty Onsite 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 Onsite at Organization
- Participation in Testbed
- Other Activities

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



**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 fees, sponsored projects, associated projects, and in-kind support) of industrial/practitioner support for the past 4 award years are presented graphically.

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

**Figure 6a: Location of Lead, Core Partner(s), and all Domestic Collaborating Institutions** — Figure 6a shows a map detailing the U.S. locations of the lead institution, core Partner institutions, collaborating institutions, community colleges, institutions that provide REU participants, and pre-colleges that provide RET participants. Please note that this map must be created by ICF. Find the **Request Maps** button in the upper right corner of the Home page.

**Figure 6b: Foreign Location of Participating Institutions**—Figure 6b shows a map detailing the locations of foreign participating institutions. Please note that this map must be created by ICF. Find the **Request Maps** button in the upper right corner of the Home page.

**Figure 6c: Country of Citizenship of ERC Foreign Personnel**—Figure 6c shows a map detailing the countries of citizenship of ERC Foreign Personnel. Please note that this map must be created by ICF. Find the **Request Maps** button in the upper right corner of the Home page.

**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 Statistics 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, postdoctorates, 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, postdoctorates, 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, postdoctorates, 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 National Center for Science and Engineering Statistics (NCSES) (formerly the Division of Science Resources Statistics) at the National Science Foundation. Categories include leadership team members, faculty, postdoctorates, 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: Current Award Year 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 the educational program, general shared equipment, new facilities/new construction, leadership/administration/management, industrial collaboration/innovation programs, Center-related travel, indirect costs, multi-year support reserved for future years, and residual funds remaining.

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.

**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 8c: Current Award Year Education Functional Budget**—This table represents the functional budget allocations for direct support and associated projects to the Center. Totals are included for Pre-College Activities; University Education; Student Leadership Council; Young Scholars (Gen-3 only); REU; RET; Assessment; and Community College Activities.

**Table 9: Sources of Support**—Table 9 provides a detailed breakdown and totals for unrestricted cash, restricted cash, associated project, residual funds, and in-kind sources of support for the Award Year 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. Information on residual funds remaining is also reported here. Multiple years of data are shown.

**Table 11: Modes of Support, by Industry and Other Practitioner Organizations**—This table lists cash and in-kind support from current members, funders of sponsored projects, funders of

associated projects, and contributing organizations; listed by organization and Award Year for both Received and Promised support.

**Volume II: Project Personnel Data**—Information provided here includes project name, project leader, project investigator, project role, title, first name, middle initial, last name, suffix, institution, title within institution, department within institution, and personnel types within institution. This information may be helpful to the Center in preparing Volume II.

**ERC Data Comparison with NSF Performance Criteria**—This table displays center-specific data across 10 NSF performance criteria and indicates the center's status in meeting these criteria. ERCWeb will calculate these values for the center and will display the status of the center in this table once all data has been entered into the system.

**Final Report tables**—For centers entering data for their 10<sup>th</sup> and final year or during a no-cost extension period, ERCWeb provides tables to be included in the center's final report. Please refer to the Final Report Guidelines located in the ERC Library for further details.

### 3. OFFLINE DATA ENTRY TEMPLATES

#### 3.1. OVERVIEW

The following seven Microsoft 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

#### 3.2. INSTRUCTIONS

The templates can be downloaded with the current data from the system (recommended) or with column headings only and no data. A link to the Offline Data Entry Templates page is available from the Home page and from the Import links found on the Supporting Organizations, Academic Institutions, Personnel, Thrusts and Projects pages of the ERCWeb system.

Your Center is not required to use all seven 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**

For more complete instructions, please review the Data Upload Spreadsheets Tutorial found on the Tutorials page within the ERC Library, Glossary and Tutorials section of ERCWeb.

## 4. SUPPORT

### 4.1. OVERVIEW

Each year, centers receive financial or in-kind support from many sources. The Support data entry section of the ERCWeb system is where centers should report all sources of support. Once entered, the amount of support from all of the various sources is available for planning the functional budget and annual expenditures budget.

There are five data entry subsections available under the ERCWeb Support Section: NSF Support, Supporting Organizations, University Support, Other Sources of Support, and Residual Funds Brought Forward. The following concepts are common to most or all of the support data entry pages.

- **Prior Award Year Actual:** The prior award year column is used to reconcile the differences between the values anticipated during the previous year and actual amounts received. The sum of the amount of support received and promised from the previous year is displayed next to the data entry fields as a reference. Prior award year columns do not appear for new centers or for new supporting organizations.
- **Prior Award Year Estimate:** An estimate will be shown in a read-only column for all sources of support. The Estimate column is the sum of the data entered for “Received by End of Reporting Year” and “Promised by End of Reporting Year” in the ERCWeb system last year. Because these calculations are only system-generated estimates, please enter the actual amount.
- **Received by End of Reporting Year:** Centers should enter the amount of support received by the end of the reporting year.
- **Promised by End of Award Year:** Since the award year ends after the reporting year, promised support may be entered for the anticipated amount expected by the end of the award year.
- **Unrestricted Cash:** Support that a center receives that is not designated to be used for a specific project but may be used for any purpose. This may include membership fees and other cash support.
- **Restricted Cash:** Support that a center receives that is designated for use on a specific (sponsored) project. Enter restricted cash donations under non-translational or translation research (see glossary).
- **Associated Project Support:** Support given to the home department of ERC faculty member rather than directly to the Center. Enter associated project support under non-translational or translation research (see glossary).
- **In-Kind Support:** Centers should document the monetary value of in-kind donations. The types of in-kind support are:

- o Equipment
- o New Construction
- o New Facilities in Existing Buildings
- o Other Assets
- o Visiting Personnel

Information specific to the five support subsections (NSF, Supporting Organizations, Universities, Other Sources of Support, and Residual Funds) are described below.

## **4.2. INSTRUCTIONS**

### **4.2.1. NSF Support**

Centers are required to complete the NSF Support data entry page yearly.

Data provided in this section, produce:

- Table 1a: Average Metrics Benchmarked Against All Active ERCs and the Center’s Tech Sector
- Table 9: Sources of Support

### **4.2.2. Supporting Organizations**

The organizations that work with or support the work of the ERC are reported here.

The organizations are listed under three tabs: **Active**, **Inactive**, and **Archived** organizations.

Active organizations are organizations for which support and involvement activities will be reported for the current award year. Inactive organizations were active during the previous award year. Archived organizations were inactive during the previous award year but active at some point prior to that.

Data provided in this section, produce:

- 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 11: Modes of Support, by Industry and Other Practitioner Organizations

## Add New Organization

The Add New Organization feature allows you to add to the current year's list of organizations that worked with or supported the work of the Center. After selecting the Add New Organization link on the Supporting Organizations data entry page, the Organization Information tab will appear.

### 4.2.2.1. Support Organizations – Organization Information Tab

Supporting Organizations are categorized by the highest level of financial commitment. They include the following types:

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

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 as a Funder of Associated 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.

**Industrial/Practitioner members** must sign a membership agreement (and satisfy all requirements for membership according to the Center's membership agreements and cooperative agreement) and must provide a sufficient level of financial support (membership fees or in-kind), according to the Center's membership agreement, during the Reporting Year. For returning industrial/practitioner members - in cases where current year funding has been received in a previous year and there is no additional support to report, there is an option in the system to indicate this.

For all other organization types, appropriate documentation includes signed contracts, agreements, MOUs, 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 10) for all the types of organizations listed above.

**Organization Name** (If the organization has been renamed, acquired, or merged, then modify the existing entry by typing the new name for the organization and marking the checkbox beneath it.)

**Support Relationship to Center**—Choose the appropriate organization type

**Sector**—Select the Sector, and Industry Size and Industry Product Focus if the relationship is industrial/practitioner member. If you select "Other" for sector, you must enter a short description.

**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). If foreign, the country of location will be required.

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

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

**Delete New Organizations**—This feature allows you to delete a new organization. Click **Delete Organization**. A warning screen will appear that will give you the opportunity to either cancel the operation or delete the organization. Organizations from previous years may not be deleted but may be marked as inactive on the Organization Information page.

#### **4.2.2.2. Supporting Organizations – Support Tab**

Enter amounts of unrestricted cash, restricted cash, associated project funds or in-kind contributions for the each supporting organization, for the three time periods indicated.

NOTE: If the center received all current year funding in a previous year, select the checkbox indicating this at the bottom of the organization support screen.

There may be non-Industrial/Practitioner member organizations (for example, Federal or State agencies) that can promise grants. In such cases the center should have the necessary documentation to show that the funds are promised in order to enter the amount in the Promised by End of Award Year category. In addition, in order to enter promised money, the organization providing the money must be “active” in the current or previous year. An active organization must have some type of involvement with the Center (see below for the categories of involvement). Promised money from a new or inactive organization whose participation or support is anticipated, but not yet materialized by the end of the reporting year cannot be reported in the system. However, the anticipation of this support can be discussed in the written Annual Report and in the presentations at the site visit.

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, and only the percentage budgeted for the current award year (direct costs only).

#### **Multi-Year Support - Optional**

If an organization provides direct support and explicitly states that the support should be used over multiple years (e.g., \$500,000 lump sum award to be used over 3 years), enter the full amount of support under the appropriate category for unrestricted or restricted cash. Then, enter the amount that will not be used in the first year, but will be reserved for future years.

The amount reserved for future years, will appear the following year as multi-year support received.



However, when associated project awards are made in a lump sum and cover multiple years, this amount must be pro-rated over each of the years, and in proportion to the amount of the associated project work that is directly related to the Center's strategic plan.

#### **4.2.2.3. Support Organizations – Involvement Tab**

##### **Types of Involvement:**

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

##### **Innovation/Entrepreneurship Activities**

Participation in **innovation/entrepreneurship activities** (research or education):

If checked, at least one innovation/entrepreneurship activity must be selected.

- Innovation/entrepreneurship training activities
- Provides incubation facilities
- Provides technology screening activities
- Provides connections to sources of commercialization funding
- Other (please specify)

##### **Technology Transfer**

If checked, at least one technology transfer activity must be selected.

- Faculty onsite at organization's location
- Faculty provides instruction to organization
- Individuals from organization involved in research projects onsite at the lead or core partner institutions
- Licensed software
- Licensed technology (other than software)
- Graduate hired by organization
- Student onsite at organization
- Participation in Testbed
- Other technology transfer activities (please specify)
  
- Other Participation (Please specify)

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

#### **4.2.3. University Support**

U.S. and Foreign Universities should be reported separately.

If no support was received from universities mark the “No support was received from U.S. Universities” or “No support was received from Foreign Universities” checkbox at the bottom of each page.

NOTE: If associated project support is received from an academic institution that has only provided funding for **associated** projects and is not involved in any other center-related activities (research or otherwise), the funds should be reported under U.S Universities or Foreign Universities.” Because the relationship with this institution does not fit into any of the existing Academic Institution or Organization types, please do not report the institution under the Academic Institutions or Organizations section.

Data provided in this section, produce:

- Table 1a: Average Metrics Benchmarked Against All Active ERCs and the Center’s Tech Sector
- Table 9: Sources of Support

#### **4.2.4. Other Sources of Support**

Appropriate other sources of support include leveraged assets or anonymous donors. Support from specific nonprofit organizations should be entered under Supporting Organizations. Support from universities should be entered in the Academic Institutions section.

Describe the source in the text field for each type of support.

Data provided in this section, produce:

- Table 1a: Average Metrics Benchmarked Against All Active ERCs and the Center’s Tech Sector
- Table 9: Sources of Support

#### **4.2.5. Residual Funds Brought Forward**

Residual funds remaining from previous years and brought forward into the current year must be entered as support in the ERCWeb system. This allows the residual funds brought forward to be used when planning the functional budget and annual expenditures and budgets. Centers are not required to report residual funds at the organizational level, instead the following sectors are used:

- NSF
- Government Sources
  - Other U.S. Government (not NSF)
  - State Government
  - Local Government
  - Foreign Government
  - Quasi-Government Research Organization

- Universities
  - U.S. Universities
  - Foreign Universities
- Industry Sources
  - U.S. Industry
  - Foreign Industry
  - Industrial Associations
- Other Sources

#### **4.2.6. Support Summary**

This table displays all incoming support received from the previous 5 sections – NSF, supporting organizations, universities, other sources, and residual funds brought forward. The total support column is the sum of direct support and associated project support. The supporting organization totals are shown by default, but can be hidden by clicking on Hide (next to Supporting Organizations).

The purpose of the support summary is to show a breakdown of the total support amounts that appear on the ‘functional budget’ and ‘annual expenditures and budgets’ data entry pages. These include:

- Total prior award year actual amounts appear in the annual expenditures budget.
- Total direct support appears in the functional budget and the annual expenditures budget.
- Total associated project support appears in the functional budget.

## 5. ACADEMIC INSTITUTIONS

### 5.1. OVERVIEW

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

Data provided in this section produce:

- Table 6: Institutions Executing the ERC's Research, Technology Transfer, and Education Programs
- Figure 6a: Location of Lead, Core Partner, and all Domestic Collaborating Institutions
- Figure 6b: Location of Foreign Collaborating Institutions and/or Foreign Partner Institutions
- Table 7: ERC Personnel
- Table 7f: Center Diversity, by Institution

### 5.2. INSTRUCTIONS

#### 5.2.1. Add/Edit Current Year Institution Data

Click on **Add a new academic institution for this award year** and provide the following information:

**Institution Type – Select one of the following:**

- Lead Institution
- Core Partner
- Collaborating Institution
- Foreign Partner
- Non-ERC Institution Providing REU Students
- Community College
- Pre-college Partner (include number of Young Scholars)
- Diversity Alliance (i.e., ADVANCE, AGEP, CREST, HBCU-UP, LSAMP, LSAMP-BD, RDE, TCUP and other NSF diversity programs)

For AGEP, CREST, LSAMP, or TCUP programs, to add a new alliance, select **diversity alliance**. In the next field, select the type of diversity alliance. If diversity alliance is not one of the types previously mentioned, select **other diversity alliance** and enter the name of the alliance in the text box. Then, indicate whether this alliance has personnel data to report. Select all other details that apply to the alliance, as well as the primary location of the alliance and then click on **Save**. In a case where the lead or partner university is also the diversity alliance, the alliance may only be listed if there is a student from the alliance participating in ERC activities in that reporting year.

## **Institution Name**

For returning institutions, you will need to click on **Save** to update the record's status to Complete.

NOTE: Do not enter an institution in this section unless a documented formal relationship is in place with a Diversity Alliance. Ideally, there will be students from the institution in addition to a formal relationship, but the system allows an entry for the institution without a student.

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.

## **Demographic Data**

Indicate whether personnel will be reported. In ERCWeb, each institution entered in the "Academic Institutions" section is assumed to have associated personnel that need to be reported under Personnel\Demographic and Occupational Data. Your Center may partner with institutions that do not have associated personnel, such as a high school or school district. When editing the record for one of these institutions, select the radio button labeled "Formal relationship exists but **no personnel** will be reported for this year." ERCWeb will not require personnel or demographic data to be entered for institutions with this option selected.

NOTE: Personnel connected with institutions are entered in the Personnel or Research section.

## **Number of Young Scholars**

For pre-college partners – indicate the number of Young Scholars associated with the institution. If there are no Young Scholars to report, the system will allow you to enter "0."

## **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:

- [Alaska Native-Serving Institutions](#)
- [American Indian Tribally Controlled Colleges and Universities](#)
- [Asian American and Native American Pacific Islander-Serving Institutions \(AANAPISIs\)](#)
- [High Hispanic Enrollment](#)
- [Hispanic-Serving Institutions \(HSIs\)](#)
- [Historically Black Colleges and Universities \(HBCUs\)](#)
- [Minority Institutions](#)
- [Native American-Serving, Nontribal Institutions](#)
- [Native Hawaiian-Serving Institutions](#)
- [Predominantly Black Institutions \(PBIs\)](#)

In addition, the ERC program includes the following classifications:

- Has predominantly female students
- Has a large number of underrepresented minority students in engineering (LNURM)

Also provide the country, city, and state of the academic institution.

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

### **5.2.2. Delete Institution Data**

To delete an institution, from the Academic Institutions screen click on Delete in the row for that 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. PERSONNEL

### 6.1. OVERVIEW

Report on individuals who are directly involved in executing activities funded by the Center. They may be engaged in leadership/administration, research, or curriculum development and outreach, or they may be REU students or industry researchers. Also included are those personnel that:

- Carry out the center's mission through involvement in projects that contribute directly to the Center by fulfilling its strategic plan
- Work on research projects reported on the Research tab
- Work on Center-related activities other than the research program
- Are paid, or unpaid

Data provided in this section, 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
- Figure 6c: Country of Citizenship of ERC Foreign Personnel
- Table 7: ERC Personnel
- Table 7a: Diversity Statistics 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

**REMINDER:** Once the Institutions and Personnel sections are complete, please request your maps (i.e., figures 6a, 6b, and 6c). From the Home page click on **Request Maps** in the upper right corner. Maps require a one week processing time and we recommend that you request them at least 2 weeks before your annual report is due.

### 6.2. INSTRUCTIONS

#### 6.2.1. Personnel Data Entry

There are two categories for data entry available in the Personnel section: By Institution and By Person. **Enter institution records for your Center before entering personnel records.** 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 the Annual Report. The Center may have other uses for these data beyond 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 as “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 the NSF Diversity Alliance award’s lead institution. REU students and K–12 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
- Academic Discipline(s)

NOTE: When entering discipline data, if the individual is not associated with a research project, this field will not yet be required. However, once an individual is reported as a project investigator in the research data entry section, this field will be required. Therefore, personnel that previously were displayed as complete on the personnel by institution screen may now appear as “in progress” and you will be required to enter these data.

- Title and department within institution

NSF Classification and Personnel Type – see 6.2.3

- Research Involvement for this person including:
  - Project Name
  - Project Role (optional)
  - Project Leader (select if applicable)
  - Project Investigator (select if applicable)

Project leaders and project investigators are listed by name in Table 2. Additional project personnel are included in the total count of personnel per thrust. By definition, project leaders are project investigators.

Personnel can be affiliated with more than one research project. For each research project, add a new row on this data entry screen.



NOTE: Personnel may be associated with research projects through the Personnel data entry page or the Project Personnel data entry page in the Research section. Projects must be entered through the Research section prior to associating Personnel with Projects in the Personnel section.

### **6.2.2. Assign a Personnel Record to Multiple Institutions**

Some personnel may be involved in Center activity at more than one institution. In ERCWeb the person needs to be associated with each institution so that the NSF classifications and personnel types specific to each institution can be reported.

First, create or update the person's record for a single institution. To add the person to an additional institution, select Personnel By Institution, and then select the link **Add a new person**. In the textbox labeled "Add a person from another institution to [institution name], type the name of the person until it appears in the auto search list. Select the name and then click on **Add this person**.

The following information previously entered for the person will be copied to this new record:

- Demographic information
- Any disciplines entered
- Any involvement in research projects, clusters, or thrusts

Enter the information specific to the new institution to complete the personnel record. Select the appropriate personnel types for the NSF classifications at the institution. Optionally, you can enter the person's title and department at the institution. Click on **Save** to update the personnel record's status to "Complete."

NOTE: Changes to the demographic information and disciplines for a person associated with multiple institutions will be reflected in every record for that person.

For more detailed instructions, please refer to the ERCWeb tutorials for Personnel data entry.

### **6.2.3. 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

#### **Research Under Strategic Research Plan:**

- Senior Faculty
- Junior Faculty
- Research Staff
- Visiting Faculty
- Industry Researcher
- Postdoc
- Doctoral Student
- Master's Student
- Undergraduate Student
- Other Visiting College Student

NOTE: Industry researchers should be reported according to the institution with which they are predominantly collaborating.

**Curriculum Under Strategic Curriculum Plan:**

- Senior Faculty
- Junior Faculty
- Research Staff
- Visiting Faculty
- Industry Researcher
- Postdocs
- Doctoral Student
- Master's Student
- Undergraduate Student
- Other Visiting College Student

**ERC REU Student:**

- NSF REU Site Award
- ERC's own REU

**Pre-College (K-12):**

- Teachers (RET)
- Teachers (non-RET)

**Research Experience for Teachers (RET):**

- Participant in RET Program
- None

NOTE: RET and Non-RET teachers must be reported by the pre-college partner with whom they are associated.

#### **6.2.4. Delete a Personnel Record**

To delete a person in ERCWeb, click on **Delete** in the row for that person.

A confirmation screen will appear where you can verify that this person should be deleted from the system. If the person being deleted is the leader of a thrust, cluster, or project, this information will be displayed on the confirmation screen. You can delete the person's record; however, the records for the associated thrust, cluster, or project will have a status of "In progress" until a new leader is assigned.

Deletion of a personnel record is specific to an institution. If you delete a person associated with more than one institution, each institution will be listed on the confirmation screen.

Only the record for the designated institution will be deleted. The person will remain connected to the other institutions. To completely remove the person from the system, delete the personnel record for each institution.

For more detailed instructions, please refer to the ERCWeb tutorials for Personnel data entry.

## 7. RESEARCH

### 7.1. OVERVIEW

The information reported in this section 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 write-up 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 in this section produce:

- Table 2: Estimated Budgets by Research Thrust and Cluster
- Figure 2a: Research Project Investigators by Discipline
- Table 8: Current Award Year 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
- Volume II: Project and Personnel Data

### 7.2. INSTRUCTIONS

Data are entered here about the ERC research effort. Based on your Center's preference, ERCWeb allows your Center to report research programs in one of two ways:

- Only thrusts and projects (see section 7.2.1 for more details).
- At the thrust, cluster, and project level (see section 7.2.2 for more details).

See glossary for definitions of thrusts, clusters, and projects.

Before each data collection, ICF will contact ERC staff via e-mail to request the center's preference for research level reporting. If you choose to report data at the thrusts-projects level, all projects will be associated directly to thrusts and no cluster data will be required.

#### 7.2.1. Report Research by Thrusts and Projects

Reporting begins with thrusts and ends with projects. From the **Thrusts** screen, click on **Add a new thrust for this award year**. Enter the thrust name, and then begin typing the thrust leader's name to select it from the auto search dropdown list. If the thrust leader does not yet have a personnel record in the system, click on **quick-add a personnel record** to add it. Also, you are required to enter an estimated next year budget allocation for the thrust on this screen. Save the thrust by clicking on **Save** at the bottom of the screen. ERCWeb will prompt you to assign projects to this thrust. Click **please enter projects for this thrust** or go to the **Projects**

screen under **Research** to assign one or more projects to this thrust. Then, click **Add a new project for this award year**.

On the Project Information tab, the system will require the following information:

- Project Name
- Project Type
- Translational Research (Yes/No)
- NSF Funding (Directly/Indirectly/N/A)
- Organizational Sponsors
- Thrust List
- Project Current Year Budget Allocation per Thrust

Save the project information by clicking **Save** at the bottom of the screen. A new row will appear to allow you to select an additional thrust if the project belongs to more than one thrust.

To complete a project, both the Project Information tab and the Project Personnel tab must be completed. At least one project investigator must be entered for each project and each project must have one project lead. The Project Role field is optional. If project role is specified, it will appear in the Volume II output.

To add an additional investigator to the list, provide data on the last row on the data entry screen. Begin typing the name of the personnel. The text field has an auto search feature that will display personnel matching the name you are typing. If the person's name is missing from the search results, click **quick-add a personnel record**. Once you finish adding personnel for this project, click **Save**.

When all thrusts and projects have been entered, the table on the main Thrusts screen will show cumulative totals for current-year and estimated next-year budgets.

Clicking on a thrust name will open the Edit Thrust screen, allowing you to change the thrust name, thrust leader, and Estimated Next Year Budget Allocation. You will also be able to click on a link to each project assigned to that thrust.

### 7.2.2. Report Research by Thrusts, Clusters, and Projects

Reporting begins with top-level Thrusts that contain Clusters and ends with bottom-level Projects that are assigned to Clusters.

Begin on the Thrusts and Clusters screen to enter a thrust and its component clusters. To enter a thrust, click **Add a new thrust for this award year**. You will be required to enter the following data for each thrust:

- Thrust Name
- Thrust Leader
- Cluster List

Enter the thrust name. Begin typing the thrust leader's name to select it from the auto search dropdown list. If the person's name is missing from the search results, click **quick-add a personnel record** (see section 7.2.3 for more details).

Under **Cluster List for this Thrust**, enter a cluster that belongs to this thrust. You will be required to enter the following information for each cluster:

- Cluster Name
- Cluster Leader
- Estimated Next Year Budget Allocation

Note that the Current Year Budget Allocation and # of Unique Projects fields are automatically calculated by the system after projects have been entered.

More than one cluster may be added for each Thrust. The estimated next year budget for the thrust is the sum of the estimated budgets for all clusters.

Save the thrust and cluster information by clicking **Save** at the bottom of the screen. The cluster cell for “# of Unique Projects” will prompt you to assign projects to a cluster. The cluster status will update to “Complete” when one or more projects have been assigned.

#### 7.2.2.1. Add a Project

Go to the Projects screen under Research to assign one or more projects to these clusters. Click **Add a new project for this award year** to create a new project and assign it to the cluster within a thrust.

On the Project Information tab, the system will require the following information:

- Project Name
- Project Type
- Translational Research (Yes/No)
- NSF Funding (Direct/Indirect/N/A)
- Organizational Sponsors
- Cluster List
- Project Current Year Budget Allocation per Cluster

Under “Cluster List for this Project,” select the Thrust-Cluster Name in the first row. Enter the current-year budget allocation for this cluster under the thrust.

Save the Project Information tab by clicking **Save** at the bottom of the screen. A new row will appear in the cluster list table to allow you to select an additional cluster if the project belongs to more than one cluster. Allocate a portion of the project budget for each cluster.

After projects are assigned to clusters with current-year budget amounts, the current-year budget allocations for the clusters will be nonzero.

When all thrusts, clusters, and projects have been entered, the table on the main Thrusts and Clusters page will show cumulative totals for current-year and estimated next-year budgets.

### 7.2.3. Enter Project Personnel

To complete a project, both the Project Information tab and the Project Personnel tab must be completed. Each thrust leader, cluster leader, project investigator, and project personnel member must have a personnel record entered in ERCWeb. If you have already entered project personnel in the Personnel tab, begin typing the name of the personnel. The text field has an auto search feature that will display personnel matching the name you are typing.

If the person does not yet have a personnel record in the system, select the link to **quick-add a personnel record**. You will be prompted to choose an existing institution for the new person. Select the institution, enter the person's name and click **Add Person**. You will be returned to the previous project personnel tab. You can now select the person from any of the fields for thrust leaders, cluster leaders, project investigators, and project personnel.

This feature allows you to quickly add partial information for project personnel so that you can complete the Research tab, however, these personnel records are not considered complete. After completing your research data entry, you will be required to return to the Personnel tab of ERCWeb to add more demographics and NSF classifications for people that were "quick added" while you were completing the research data entry component. You can view these personnel in the Personnel tab by name or by institution.

### 7.2.4. Delete a Thrust, Cluster, or Project

#### 7.2.4.1. Deleting a Project Record

Project records can be deleted at any time. Delete a project by clicking on **Delete** for that project on the main Projects screen.

A confirmation screen will appear where you can verify that this project should be deleted from the system. Any personnel associated with the project will still remain in the system.

#### 7.2.4.2. Deleting a Cluster Record

Centers reporting research in three levels may need to delete a cluster. Clusters are deleted from thrusts. Delete a cluster by clicking on **Delete** link for that cluster within the Thrust record.

A confirmation screen will appear where you can verify that this cluster should be deleted from the thrust. Any projects assigned to the cluster will still remain in the system. Any “orphaned” projects should be deleted or reassigned to other clusters.

Your Center may have multiple thrusts containing the same cluster. To remove the cluster from the system, the cluster must be deleted from each thrust. In other words, if two thrusts contain the same cluster, delete all instances of the cluster by deleting the cluster from each thrust separately.

A confirmation screen will appear where you can verify that this thrust should be deleted from the system. Any projects assigned to the thrust being removed will still remain in the system. Any orphaned projects should be reassigned to other thrusts.

### **7.2.4.3. Deleting a Thrust Record**

Delete a thrust by clicking on Delete at the bottom of the thrust record.

A confirmation screen will appear where you can verify that this thrust should be deleted from the system. Any projects assigned to the thrust being removed will still remain in the system. Any orphaned projects should be reassigned to other thrusts.



## 8. BUDGETS

### 8.1. OVERVIEW

The data collected in this section are prior-year expenditures and detailed functional current-year budgets.

Data provided in this section produce:

- Table 8: Current Award Year Functional Budget
- Figure 8a: Functional Budget as a Percentage of Direct Support
- Figure 8b: Functional Budget as a Percentage of Associated Project Support
- Figure 8c: Current Award Year Education Functional Budget
- Table 10: Annual Expenditures and Budget

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.

#### 8.1.1. Annual Expenditures and Budgets

The categories in this section match the standard NSF form 1030 Summary Proposal Budget. , 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. Funds from all sources that are managed by the Center are 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 funds, not just the ERC Program core support.

NOTE:

The actual amount reported for residual funds for the prior award year should be equal to the total 'Residual Funds Brought Forward' for the Current Award Year. Generally, the remaining residual funds at the end of an award year should be the same residual funds amount at the start of the next award year.

### **Expenditures Categories:**

- Salaries - Senior Personnel: PI/PD, Co-PIs, Faculty, and Other Senior Associates
- Salaries - Other Personnel:
  - Postdoctoral Associates
  - Other Professionals
  - Graduate Students
  - Undergraduate Students
  - Secretary-Clerical
  - Other
- Fringe Benefits
- Equipment (for items exceeding \$5,000)
- Travel
- Participant Support
- Other Direct Costs:
  - Materials and Supplies
  - Publications/Documentation/Dissemination
  - Consultant Services
  - Computer Services
  - Other
- Direct Cost Total are calculated
- Indirect Costs

### **8.1.2. Functional and Educational Budget**

**Read-only summary of Thrust/Testbed Budgets** is compiled from data previously entered and is displayed at the top of this screen.

### **Budget Functions**

Enter the current award year functional budget for Education Programs and for Other Functions as listed below. List the Direct Support and the Associated Project funding for each function.

- Education Programs
- Pre-College Activities
- University Education

- Student Leadership Council
- Young Scholars
- REU
- RET
- Assessment
- Community College Activities
- Other (explain in narrative)

#### Other Functions

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

The Functional and Educational Budget totals must match the total reported sources of support. See the Support Summary for a breakdown of reported incoming support. Total reported sources of support include residual funds, but do not include in-kind contributions. **You will not be able to mark this section as complete until the Functional and Educational Budget totals match the total reported sources of support.**

#### 8.1.2.1. Totals and Residuals Summary

This shows the total support (incoming money) and total expenditures and budget, multi-year support reserved for future years, and residual funds remaining. The balance must equal \$0 for the budgets section to be shown as complete. Once the functional and educational budget total, multi-year support, and residual funds are subtracted from the total support, the total budget balance will appear in the last line. If there is a final balance, that balance should be moved to the residual funds row in order to achieve a balance of \$0.

An explanation of the residual funding should be entered in the text box (optional).

## 9. OUTPUTS AND IMPACT

### 9.1 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

### 9.2 INSTRUCTIONS

All counts are per Reporting Year. Please check glossary for definitions.

#### 9.2.1 Quantifiable Outputs

##### **Publications resulting from center support**

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

##### **Publications resulting from associated projects**

Indicate the number of publications resulting from **Associated 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

### **Publications resulting from sponsored projects**

Indicate the number of publications resulting from **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

NOTE: Papers 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.)

### **Inventions, Patents, and Spin-off Companies**

Indicate numbers:

- Inventions disclosed (submitted to agencies by researchers or technology transfer office)
- Provisional patent applications filed
- Full 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

### **Degrees and Jobs**

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

Indicate the job sector of ERC graduates noted above for the following categories:

- Industry
  - ERC member firms
  - Other U.S. industry
  - Other foreign industry
- Government
- Academic institutions
- Other
- Undecided/still looking/unknown

### **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, ongoing courses with ERC content
- New textbooks based on ERC research
- New textbook chapters based on ERC research
- Free-standing course modules or instructional CDs 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

### **Information Dissemination/Educational Outreach**

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 section 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 event
  - Number of teachers/faculty that attended event
- ERC-sponsored educational outreach events for Community College students:
  - Number of Community College students that attended event
  - Number of community college faculty that attended event

- ERC-sponsored educational outreach events for non-ERC Undergraduate students:
  - Number of students who attended activity
  - Number of teachers/faculty who attended activity

### **Personnel exchanges**

Indicate numbers of:

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

### **9.2.2 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.

## 9. GLOSSARY

**Additional Project Personnel**—A reporting category of personnel used in Table 2 to refer to personnel working on a particular project who are not the project investigators or in a leadership position on the project (see Project Investigator). They are not listed by name in table 2, although they are counted in the total number of personnel working in a Thrust.

**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.

**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.

**Annual Expenditures Budget**—Annual expenditures from the prior award year, the budget for the current award year, and the proposed budget for the next award year are reported. Do not include associated project expenditures. The expenditures are broken down by salaries and benefits, equipment, travel, participant support, other direct costs, and indirect costs. The categories correspond to NSF Form 1030. The annual expenditures budget total must match the total reported sources of support received or promised for the current award year. This budget includes support from NSF, organizations, universities, and other sources of support, and residual funds brought forward from the preceding year.

**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, and only the percentage budgeted for the current award year. 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 as specified in the official Award Letter and Cooperative Agreement. 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.

**Budget**—See Annual Expenditures Budget, or Functional and Educational Budget.



Cash Support – Unrestricted or restricted funds provided to the Center.

**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.

**Centers of Research Excellence in Science and Technology (CREST)**—NSF funds the CREST program. The program makes resources available to enhance the research capabilities of minority-serving institutions through the establishment of centers that effectively integrate education and research. The CREST program promotes the development of new knowledge, enhancements of the research productivity of individual faculty, and an expanded presence of students historically underrepresented in science, technology, engineering, and mathematics (STEM) disciplines.

**Citizenship Status**—Each individual qualifies as one of the following:

- U.S. Citizen or permanent resident
- Foreign (temporary visa holder)
- Citizenship not reported

**Cluster**—Collections 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 goals, working together to solve a common problem. Every cluster must contain at least one project.

**Collaborating Institutions**— Institutions that carry out focused research, curriculum development-related activities for the ERC, or provide affiliated faculty to the ERC. **These institutions may be academic or non-academic.** In some cases, ERC funds are provided to the institutions, faculty members, or students. In those cases, funds go to the collaborating institutions through a sub-award 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. In this type of arrangement, personnel from such institutions 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.

**Community College**—An institution that prepares students to enter the workforce with certificates or associate degrees and/or prepares students to transition to 4-year colleges or universities.

**Contributing Organization**— An organization that provides non-project-specific support to the ERC through grants, equipment, or other real donations but does not satisfy all criteria for full membership. 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 curricula, and a shared program of industrial collaboration. The lead university accepts the overall management and financial responsibility for the Center. Core partner institutions have a significant expertise in an area important to achieving the center’s vision that is expected to continue over the lifetime of the Center. Lead and core partner institutions are generally required to cost-share (except for some of the Class of 2008).

**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. For reporting purposes, individual projects should be grouped together into clusters or thrusts 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 an Annual Report is submitted to NSF.

**Curriculum development and outreach**—This classification applies when personnel are working on curriculum development and outreach ONLY ,and 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 (see ERC Student definition on page 43) may be included in these counts. In addition, in order to be counted as a degree to an ERC student, the ERC student must have been involved in ERC research full time for a minimum of a summer (3 months) or the equivalent on a part-time basis prior to graduation. Individuals whose degrees are included here must have been reported previously as ERC students, unless the participation in the ERC took place within the last 12 months.

**Direct Cost**—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 directly to the Center and identified as either “Restricted Cash” (for a purpose specified by the sponsor) or “Unrestricted Cash” (no specific purpose specified).

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

**Discipline**—Each faculty member’s Ph.D. field or field of other highest degree.

**Diversity Alliances**—**Programs funded by NSF to support diversity initiatives.** Some types include Advance, AGEF, CREST, HBCU-UP, LSAMP, LSMAP-BD, RDE, and TCUP programs. 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.

**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 collaborating 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.

**Domestic/Foreign**—Indicate whether the organization's main headquarters is in the U.S. or in another country.

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

**Education Program Direct Costs**—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: Current Award Year Education Functional Budget

- Pre-College Education Activities: Includes staff salary, but does not include REU or RET budgets
- 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 the research budget.
- 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.
- Young Scholars: Required for Gen-3; should be included for other Centers with Young Scholar Program as defined in the ERC Reporting Guidelines.
- REU/RET: Should include student mentoring (REU); travel costs, housing, meals, etc. REU budget should not be included in Pre-College Activities. Minimum of \$42,000 each must be allocated for REU and RET programs, without overhead.
- Assessment: Should include staff time spent on evaluation and assessment as well as subcontractor and outside evaluator time, and topic-specific materials.
- Community College Activities: If applicable for any ERC. Community college faculty RET participants should not be included here.
- Other: Can include Continuing Education and Informal Education, Time Spent with Practitioners; should include anything that does not fit into other categories.

**Education/Outreach Program Leader**—The individual(s) responsible for the Center’s overall education/outreach program. May also be called Education Director.

**Educational Outreach Event Participants**—Individuals who participate in educational outreach events of the Center. They may be K-12 students, Community College students or teachers, or they may be involved in ERC sponsored workshops. No demographic data is collected for these individuals.

ERC – The National Science Foundation-sponsored Engineering Research Centers (ERCs) are a group of interdisciplinary centers located at universities all across the United States, each in close partnership with industry. Each ERC provides an environment in which academe and industry can collaborate in pursuing strategic advances in complex engineered systems and systems-level technologies that have the potential to spawn whole new industries or to radically transform the product lines, processing technologies, or service delivery methodologies of current industries. Activity within ERCs lies at the interface between the discovery-driven culture of science and the innovation-driven culture of engineering. The centers provide the intellectual foundation for industry to collaborate with faculty and students on resolving generic, long-range challenges, producing the knowledge base needed for steady advances in technology and their speedy transition to the marketplace.

ERC faculty, students and industry partners integrate discovery and learning in an interdisciplinary environment that reflects the complexities and realities of real-world technology. ERCs expose prospective students (both graduate and undergraduate) to industrial views in order to build competence in engineering practice and to produce engineering graduates with the depth and breadth of education needed for success in technological innovation and for effective leadership of interdisciplinary teams throughout their careers. ERC innovations in research and education are expected to impact curricula at all levels, from precollege to life-long learning, and to be disseminated to and beyond their academic and industry partners.

ERCs fulfill NSF's strategic goal to increase the diversity of the scientific and engineering workforce by including all members of society, regardless of race, ethnicity, or gender, in all aspects of the centers' activities. Because ERCs play critical roles in academe by integrating research, education, diversity, outreach, and industrial collaboration, NSF views ERCs as change agents for academic engineering programs and the engineering community at large.

<http://www.erc-assoc.org/about>

**ERC Faculty**—Assistant, associate, or full professors at lead, core partner, foreign partner, or collaborating 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 Influence on Curriculum**—Separate counts of full degree programs, degree minors or minor emphases, and certificate programs and the names of each are requested. New degree programs, minors, or certificate programs should be reported only in the first year in which both (1) the sequence of courses is offered in its entirety, and (2) it has obtained official university clearance to be offered for credit. **ERC Personnel**—Individuals who are directly involved in executing activities funded by the Center. They may be paid or unpaid. The classifications and personnel types are listed below.

<b>Classification</b>	<b>Personnel Type</b>
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
	Research Staff
	Visiting Faculty
	Industry Researchers
	Postdocs

Classification	Personnel Type
	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)
Research Experience for Teachers (RET)	Participant in RET Program
	None

**ERC Postdocs**—Researchers with recent doctoral degrees, usually in 1- or 2-year research positions at the Center, working for the lead, core partner, or collaborating institutions receiving project support from the ERC that is reported in Table 2: Research Program Organization and Effort and Table 9: Sources of Support. Their involvement is viewed as a continuation of their training and may include working on ERC curriculum development. Postdocs may also work on associated projects in the research strategic plan that are reported in tables 2 and 9.

**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 Sponsored Educational Outreach Events for K–12 or Community Colleges**—An educational event 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 or Community Colleges.

**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 collaborating 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**—Undergraduates supported by funds that do not come from the NSF REU program to ERCs to participate in a center REU program. Usually the funds come from discretionary sources within the ERC, the ERC's education/outreach programs, or from a mix of center activities. Centers must spend at least \$42K per year on an REU program out of their own budget (e.g. every center should have at least \$42K worth of ERC's Own REU students), even if they win an NSF REU site award.

**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 sub-awardee to spend) have not been expended until the other party has incurred costs, billed them back to the Center, and been reimbursed.

**Fiscal year**— The Federal Fiscal Year runs from 10/1 to 9/30. Each partner institution’s Fiscal Year and State Fiscal Year can differ.

**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 (i.e., not U.S. citizens or permanent residents) 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.

**Forward Funding**—A one year advance award of NSF ERC funds for an existing Center.

**Freestanding course modules or instructional CDs based on ERC research**—Modules or CDs 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.

**Full Patent Applications**—A full application for patent is a U.S. national application for patent filed in the United States Patent and Trademark Office (USPTO). It requires a formal patent claim, oath or declaration, or any information disclosure (prior art) statement. The application is then examined by a patent examiner at USPTO, and may be issued as a patent if all the requirements for patentability are met.

**Function**—The Center’s operational domains (usually thrusts) that can incur costs.

**Functional and Educational Budget**—The budget for the current award year broken down by research thrusts, education programs, and other budget functions. The functional and educational budget total must match the total reported sources of support received or promised for the current award year. The budget for associated projects must match the total associated project support received or promised for the current award year. This includes support from NSF, organizations, universities, and other sources of support, and residual funds brought forward from the preceding year.

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

**Funders of sponsored projects** —This type of organization funds a sponsored project and provides cash to the Center for one or more sponsored projects under the scope of the ERC’s strategic plan. The total amount of cash provided by the organization for such projects is included in Table 2: Estimated Budgets by Research Thrust and Cluster.

**General and shared equipment**—Equipment that benefits the entire ERC.

**Hispanic or Latino**—A person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race. Hispanic or Latino persons can be of any race.

**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 Collaborations/Innovation Programs Budget function**—Costs for industrial meetings, technology transfer activities, the industrial liaison officer, and staff salaries.

**Industrial Collaboration/Innovation Program Costs**—Costs that include industrial meetings, technology transfer activities, industrial liaison officer, and staff salaries.

**Industrial Liaison Officer**—The individual who 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 ILOs 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.

**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, venture capitalists, or other. The total amount of cash or in-kind support provided by members is reported in Table 9: Sources of Support.

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

**Industry Size**—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

**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. In-Kind contributions must be documented.

**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 Partners**—Organization participating in the ERC with a mission to stimulate entrepreneurship and innovation.

**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.

**Institution with large numbers of underrepresented minority students in Engineering**—Institutions whose underrepresented minority student population in engineering comprises at least 25 percent of the total undergraduate enrollment, but does not fit any of the Federally recognized categories of institutions serving minority students.

**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.

**Interdisciplinary Research**—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.<sup>1</sup> (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](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, or collaborating 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.

**K-12 Institutions**—Pre-college schools partnered with the ERC for educational outreach activities. The ERC may recruit RET candidates and/or Young Scholars from these schools.

**Lead 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 partner institutions have a significant expertise in an area important to achieving the center’s vision that is expected to continue over the lifetime of the Center. Lead and core partner institutions are generally required to cost-share (except for some of the Class of 2008).

**Leadership Team**—Director, deputy director, thrust leaders, education program leader(s), industrial liaison officer, administrative director, and any other Center-appointed management positions such as associate director (e.g., associate director of research, associate director of strategic planning, etc.)

**Leadership/Administration/Management\_Functional Budget Category** —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.

**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.

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<sup>1</sup> 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.

**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.

**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, 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.<sup>2</sup>

**Multidisciplinary Team**—A team formed from distinct disciplines as evidenced by members’ degrees from different departments (e.g., chemical engineer, chemist, electrical engineer, biologist).

**Multi-Year Support**— Funds from a sponsor that are specifically designated for use over multiple years. The ERCWeb system allows you to record the full amount in the year in which the funds are received or awarded, and to also indicate the amount reserved for future years. This optional feature enables more accurate residual reporting.

**New Facilities/New Construction Functional Budget Category**—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, it 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.

**Non-translational research**—Research that is related to the discovery, understanding, or demonstration of a new concept or idea. Research that is related to the demonstration of an integrated system of contributing technologies to perform a new or enhanced function. Research up to and including the proof-of-concept breadboard stage. Research that focuses on enhancements or refinements necessary for potential commercialization, *beyond* the proof-of-concept stage, is considered **translational** research.

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<sup>2</sup> 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.

**NSF-** The National Science Foundation (NSF) is an independent federal agency created by Congress in 1950 "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense..."

**NSF ERC base award—Amount of** funds awarded to the lead institution of the ERC annually by the ERC Program through a cooperative agreement.

**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 on the NSF Support Tab..

**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—An award issued to an institution through the NSF Research Experience for Undergraduates (REU) Site and Supplements program.** A proposal is submitted in response to the NSF-wide program announcement for REU sites and supplements and undergraduate students are supported. (See Research Experience for Undergraduates program)

**Other Personnel—**A salary category of personnel used in Table 10 and on NSF Form 1030. Other personnel include the following: postdoctoral associates, other professionals, graduate students, undergraduate students, secretary-clerical, other.

**Other visiting college students—**Students at institutions other than lead, core partner, or collaborating 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.

**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 precise patent numbers issued by the relevant patent-granting body as documentation of the count in case of an audit.

**Personnel—**(see ERC Personnel)

**Personnel Exchanges—**There are three types of personnel exchanges:

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

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 one 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.

**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, or collaborating 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.

**Pre-college Partners**—K–12 pre-college schools that have formal agreements with the ERC to participate in various educational outreach activities offered by the ERC including Research Experiences for Teachers and the Young Scholars program.

**Project**—The smallest unit of work, supporting one or two faculty and one or two students on a focused piece of work. Every project must be assigned to at least one thrust (if reporting two levels) or one cluster (if reporting three levels) so that Table 2 does not convey the impression that the Center is a collection of single investigator efforts but rather shows how the Center is an integrated body of work that will ultimately support the systems level goals.

**Project Investigator**—Typically faculty members conducting research or supervising students on a project. In unusual cases, this could be a student if he or she provides a significant leadership role on the project. Project investigators appear by name, institution, and discipline on Table 2, as well as being counted in the thrust totals of personnel. Additional personnel, not in a leadership role, working on a project should be reported as “additional project personnel.”

**Proposed budget**—The amount (direct costs only) that the Center proposes to spend in the next Award Year on a Center project. If the Center plans to add one or more new projects or thrusts in the next Award Year, add the thrusts and projects and specify the proposed budget for each. Include only direct costs. The spending plan is for all expected cash, not only the ERC Program core support.

**Provisional Patent Application**—A provisional application for patent is a U.S. national application for patent filed in the United States Patent and Trademark Office (USPTO). It allows filing without a formal patent claim, oath or declaration, or any information disclosure (prior art) statement. It provides the means to establish an early effective filing date in a later filed non-provisional patent. It also allows the term "Patent Pending" to be applied in connection with the description of the invention.

**Publications resulting from Center Support, Associated Projects or Sponsored Projects**—Full-length papers contained in peer-reviewed technical journals, peer-reviewed conference proceedings, or in trade journals that are the result of work supported through only one of these three types of projects. 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 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 and Computer Science 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. Each center is required to spend a minimum of \$42K per year of center-controlled funds on an RET program. This is in addition to any RET site award that the center or ERC faculty may have.

**Research Experiences for Undergraduates (REU) Program—**This is an NSF-wide program that 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 integrated proposals to initiate and conduct projects that engage a number of students in ERC research. ERC REU Sites must be based in the interdisciplinary research of the ERC with a coherent intellectual theme.
- REU supplements to ERC faculty for ongoing NSF-funded research projects may be added to the base ERC REU award.

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.

In the ERC program, Centers are required to devote a minimum of \$42,000 per year to an REU program. This is in addition to any REU site award the center or ERC faculty may receive. Within the ERC program, the REU program generally occurs in the summer for a set period of time (e.g., 6–10 weeks) and is aimed at students who do not attend the ERC lead or partner institutions. The REU program is used to give the benefit of ERC experience to a broader range of students beyond those attending the ERC schools, and to allow for the potential to recruit a more diverse cadre of students into the ERC for graduate school.

**Research Staff Personnel Type—**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.

**Research Thrust Management and Strategic Planning Personnel Type—**This category includes members of the Center's leadership team who oversee the management of thrusts (especially their interactions) or manage the Center's strategic planning and execution. People in this category may be faculty.

**Residual Funds**—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). 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 not spent in the year received from industry or other non-Federal sources 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.

**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.

**Research Experience for Undergraduates (REU) Students**—Undergraduate students who are involved in REU program activities at the Center. REU students are reported separately from other undergraduate students involved with ERC projects. REU students are affiliated with the institution at which they are matriculating, rather than with the institution where they participate in an REU program. An REU student may also be counted as an undergraduate student if they qualify as such during the school year.

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

- U.S. Government (not NSF)—U.S. Government (e.g., U.S. Department of Defense agency or facility, U.S. Department of Energy (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.

**Senior Faculty**—Associate or full professors at lead, core partner, affiliate, or collaborating 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 events, regardless of whether they are paid by these projects. There is no minimum time requirement for this involvement.

**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, Defense Advanced Research Projects Agency (DARPA) awards to the Center, and industry-sponsored projects with clearly intended outcomes or activities.

**Staff Personnel Type** —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 provides instruction to the organization
- Individuals from the organization involved in research projects onsite at the lead or core partner institutions
- 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)

**Thrust**—A broad collections of clusters or projects with a common, overarching goal or technical theme that supports the overall engineered systems vision of the Center. Every thrust must contain at least one project (if reporting two levels) or one cluster (if reporting three levels).

**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.

**Tribal Colleges and Universities Program (TCUP)**—NSF funds the TCUP program. The program provides awards to Tribal Colleges and Universities, Alaska Native-serving institutions, and Native Hawaiian-serving institutions to promote high-quality science, technology, engineering, and mathematics (STEM) education, research, and outreach. TCUP-eligible institutions are predominantly 2-year and community colleges that aim to increase Native individuals’ participation in STEM careers.

**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 Activities

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

Technology Transfer

- Faculty onsite at organization’s location
- Faculty provides instruction to organization
- Individuals from organization involved in research projects onsite at the lead or core partners institution
- Licensed software
- Licensed technology (other than software)
- Graduate hired by organization
- Student onsite at organization
- Participation in testbed
- Other technology transfer activities

**Undergraduate students**—Research assistants involved in ERC research generally during the school year and enrolled in an undergraduate program at lead, core partner, or collaborating 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.

**Underrepresented Minority**—A member of any of these racial groups: Black/African American, Native American/Alaskan Native, or Hawaiian Native or Pacific Islander.

**Unrestricted cash**—Funding provided directly to the Center, which may be used for any purpose.

**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, then 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.

These donations include:

- New Construction Value
- Equipment Value
- New Facilities in Existing Buildings Value
- Visiting Personnel Value
- Other Assets

**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, then 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, nor collaborating 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. Students who graduate from high school are also eligible to participate in the Young Scholars program in the summer following graduation.