IUCRC PROGRAM
FINDINGS FROM THE CENTER STRUCTURE DATABASE

DRAFT RESULTS: FY 2013-2014
*Data collected from 66 out of total 66 active centers

TRENDS FROM CENTER STRUCTURE DATABASE:
1980-2014

Gray, D.O., Leonchuk, O., & McGowen, L.C.
North Carolina State University
Understanding Center Count and Activity Statistics

FY 2014

66 NSF Funded Centers > 1 yr. (completed a project year)

11 NSF Funded Centers < 1 yr. (no project year completed)

= 77 Funded Centers

Statistics on Total and Average Activity
NSF and Center Budgeting Life Cycle

**NSF Fiscal Year**
- Oct FY1
- Mar FY1
- Aug FY1

**NSF Fiscal Year**
- Oct FY2
- Mar FY2
- Aug FY2

**Center Project Year**

**IUCRC Report Completed**
Center Life Cycle*

Active Centers  Phased Out Centers

(Current Year)

(Cumulative Record)

*Data Current for NSF FY2014

NSF-I/UCRC Center Structure Database
Single & Multi-Site Centers*

Industry/University Cooperative Research Centers

NSF-I/UCRC Center Structure Database

*Data Current for NSF FY2014
ACTIVE CENTERS AND SITES BY YEAR*

Centers Sites

~3 Sites/Center

Plus 5 Int’l Sites

*Data Current for NSF FY2014

NSF-I/UCRC Center Structure Database
Total Program Funding

FY 2013-2014 NSF-I/UCRC Center Structure Database
Average & Median Total Center Funding

FY 2013-2014 NSF-I/UCRC Center Structure Database
NSF Budget by Year

Note: 2005-2014: Include Supplemental Funding and CISE
NSF Budget by Year

- Other Programs co-fund too!

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<th>FRP Program</th>
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FY 2013-2014 NSF-I/UCRC Center Structure Database
Average NSF IUCRC Awards & Supplements per Center

FY 2013-2014 NSF-I/UCRC Center Structure Database
Average NSF IUCRC Funding per Site

FY 2013-2014 NSF-I/UCRC Center Structure Database
Total Funding by Source in Dollars

FY 2013-2014 NSF-I/UCRC Center Structure Database
Industrial Memberships

Total Number of Memberships

Average Number of Memberships

Complex changes:
- 2011: Phase 3 introduced = 4 mature centers added, increasing average
- 2012: BSAC re-enters via Phase 3, increasing average
- 2011-2014: Massive growth in new centers established (N = 32), decreasing average

FY 2013-2014 NSF-I/UCRC Center Structure Database
Average Membership Turn Over

*Newly funded Centers’ members are not counted as Members Added

FY 2013-2014 NSF-I/UCRC Center Structure Database
Member Turnover Rate

Turnover % = Members terminated in “year X+1” / Total members in “year X”
National Context for Industry Membership: Theory and Reality

Open Innovation

- **Challenge**
  - Even the largest firms and N.I.S. can only capture a fraction of scientific talent available

- **Open Innovation**
  - Increasing use of external sources of R&D
    - VP for Open Innovation; National Meetings on Open Innovation
  - Absorptive capacity; networks; partner scanning

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**Figure 5-2**

- Federal government
- Academic institutions
- All other sources
- State/local government
- Industry

NOTE: Science and engineering R&D; non-S&E R&D not included.

Science and Engineering Indicators 2012
Member Composition 2005-2014

^ Categories comprising Others include: non-profit, non-US gov’t, and other org.

FY 2013-2014 NSF-I/UCRC Center Structure Database
Member Composition 2005-2014

Categories comprising Others include: non-profit, non-US gov’t, and other org.

FY 2013-2014 NSF-I/UCRC Center Structure Database
Average Number of Researchers per Center

Note: As of 2003, NSF changed the label of "non-faculty" researchers to "post doc" researchers

FY 2013-2014 NSF-I/UCRC Center Structure Database
Funding per Researcher Total

Total Dollars per Researcher

FY 2013-2014 NSF-I/UCRC Center Structure Database
Intellectual Property & Commercialization Events 04-14 Totals


FY 2013-2014 NSF-I/UCRC Center Structure Database
Average Number of Intellectual Property & Commercialization Events 04-14


FY 2013-2014 NSF-I/UCRC Center Structure Database
Total Students Trained

- Masters (2014 Mean = 8.05)
- PhD (2014 Mean = 16.56)
- BS (2014 Mean = 7.64)

FY 2013-2014 NSF-I/UCRC Center Structure Database
Average Students Trained

FY 2013-2014 NSF-I/UCRC Center Structure Database
Total Students Graduated

- Masters (2014 Mean = 3.89)
- PhD (2014 Mean = 3.73)
- BS (2014 Mean = 2.39)

FY 2013-2014 NSF-I/UCRC Center Structure Database
Average Students Graduated

- Masters
- PhD
- BS

FY 2013-2014 NSF-I/UCRC Center Structure Database
Total Students Hired by Members

- Masters (2014 Mean = 0.97)
- PhD (2014 Mean = 1.33)
- BS (2014 Mean = 0.50)

FY 2013-2014 NSF-I/UCRC Center Structure Database
Average Students Hired by Members

FY 2013-2014 NSF-I/UCRC Center Structure Database

Rebound for hiring PhDs
CISE & ENG Partnership

Some Comparisons and Recent Trends
Growth in # of CISE & ENG Centers over time*

*Data Current for NSF FY2014
2014 CISE & ENG: Funding by Source

![Graph showing funding by source for CISE and ENG. The graph is divided into two parts: Total Dollars and Average Dollars. The Y-axis represents Total Budget in millions of dollars, ranging from 0 to 90,000,000. The X-axis represents categories such as IUCRC, Other NSF, Indust. Mem. Fees, Other Industry, State, Other (Fed., Non-Fed., Other Cash), and University. The bars indicate the total dollars received for each category, with CISE and ENG represented by different colors. The Average Dollars graph shows a similar breakdown with a Y-axis ranging from 0 to 3,000,000 and an X-axis with the same categories.]

FY 2013-2014 NSF-I/UCRC Center Structure Database
CISE & ENG: Average Students Trained

* CISE averages exclude one outlier Center
FY 2013-2014 NSF-I/UCRC Center Structure Database

Masters
PhD
BS

0
5
10
15
20
25
30
35

'06
'07
'08
'09
'10
'11
'12
'13
'14

Masters
PhD
BS

0
5
10
15
20
25
30
35

'06
'07
'08
'09
'10
'11
'12
'13
'14
CISE & ENG: Average Students Graduated

* CISE averages exclude one outlier Center
FY 2013-2014 NSF-I/UCRC Center Structure Database
CISE & ENG: Average Students Hired

CISE

ENG

* CISE averages exclude one outlier Center
FY 2013-2014 NSF-I/UCRC Center Structure Database
CISE & ENG: Intellectual Property & Commercialization Events 06-14 Totals

*2014 ENG Invention Disclosures outliers: Berkeley Sensor & Actuator Center = 20,
CISE & ENG: Intellectual Property & Commercialization Events 06-14 Totals (without VDI outlier)

*2014 CISE Invention Disclosures outliers: Identification Technology Research = 17, and E-Design = 12.
*2014 ENG Invention Disclosures outliers: Berkeley Sensor & Actuator Center = 20.

FY 2013-2014 NSF-I/UCRC Center Structure Database
CISE & ENG: Intellectual Property & Commercialization Events 06-14 Averages


*2014 ENG Invention Disclosures outliers: Berkeley Sensor & Actuator Center = 20,
CISE & ENG: Intellectual Property & Commercialization Events 06-14 Averages (without VDI outlier)

FY 2013-2014 NSF-I/UCRC Center Structure Database

*2014 CISE Invention Disclosures outliers: Identification Technology Research = 17, and E-Design = 12.

*2014 ENG Invention Disclosures outliers: Berkeley Sensor & Actuator Center = 20,
2014 Phase-based comparison
N of Centers by Phase*

*Data Current for NSF FY2014

IUCRC Evaluation Project
Total Program Funding

Phase 1: $49,000,000
Phase 2: $44,000,000
Phase 3: $43,000,000
Average & Median Total Center Funding

Centers get larger over time

IUCRC Evaluation Project
Average NSF IUCRC Awards & Supplements

Phase 2 centers getting rewarded

FY 2013-2014 NSF-I/UCRC Center Structure Database
Total Funding by Source in Percentages

FY 2013-2014 NSF-I/U CRC Center Structure Database
Industrial Memberships

Total Number of Memberships

Average Number of Memberships

Phase 1 | Phase 2 | Phase 3
---|---|---
Total Number of Memberships: 450
Average Number of Memberships: 25
Average Membership Turn Over

*Newly funded Centers’ members are not counted as Members Added

FY 2013-2014 NSF-I/UCRC Center Structure Database
Member Turnover Rate

Turnover % = Members terminated in “year X+1” / Total members in “year X”
Average Funding per Researcher

FY 2013-2014 NSF-I/UCRC Center Structure Database
Average Number of Intellectual Property & Commercialization Events

- Invention Disclosures
- Patent Applications
- Patents Granted
- Software Copyrights
- Licensing Agreements
- Royalties Realized
- Spinoff Companies Formed

Phase 1
- Invention Disclosures: ~2.5
- Patent Applications: ~1
- Patents Granted: ~0
- Software Copyrights: ~0.5
- Licensing Agreements: ~0.5
- Royalties Realized: ~0
- Spinoff Companies Formed: ~0

Phase 2
- Invention Disclosures: ~1.5
- Patent Applications: ~1
- Patents Granted: ~0.5
- Software Copyrights: ~0.5
- Licensing Agreements: ~0.5
- Royalties Realized: ~0
- Spinoff Companies Formed: ~0

Phase 3
- Invention Disclosures: ~3.5
- Patent Applications: ~2
- Patents Granted: ~1.5
- Software Copyrights: ~1
- Licensing Agreements: ~1
- Royalties Realized: ~1
- Spinoff Companies Formed: ~1

FY 2013-2014 NSF-I/UCRC Center Structure Database
Average Students Graduated

Phase 1
- Masters: 2
- PhD: 1
- BS: 1

Phase 2
- Masters: 6
- PhD: 4
- BS: 3

Phase 3
- Masters: 1
- PhD: 8
- BS: 3

FY 2013-2014 NSF-I/UCRC Center Structure Database
Average Students Hired by Members

Phase 1
- Masters: 0.4
- PhD: 1.2
- BS: 1.0

Phase 2
- Masters: 1.8
- PhD: 1.6
- BS: 0.8

Phase 3
- Masters: 1.8
- PhD: 2.0
- BS: 1.0

FY 2013-2014 NSF-I/UCRC Center Structure Database
QUESTIONS?