

VIDEO CLIPS COLLECTED DURING THE MEETING

- During the next 2 days, Bob Pauley and Mark Supal will be filming short statements by center and site directors.
- Please provide specific examples of Center generated IAB successes such as examples of tech transfer, patents in use, productivity increases, students hired by IAB members, etc.
- Video clips will be short – **2 sentences max**
- Examples:
 - “I am John Doe, Director of the Center for Good Stuff (CGS) at the University of XXXXX. Last year the Center for Good Stuff saved Boeing (NALCO, etc.) 2 Million dollars.”
 - “I am John Doe, Director of the Center for Good Stuff (CGS) at the University of XXXXX. Last year all the CGS graduating students were hired by IAB members.”

I/UCRC Annual Directors' Meeting January 12, 2012

**Rathindra (Babu) DasGupta & Larry Hornak, IIP/ENG
Alex Schwarzkopf, Consultant
Rita Rodriguez, CNS/CISE**

Welcome to the Industry/University
Cooperative Research Centers

Please Read This Carefully

- This handout has **48** slides; however, because of time constraint, I will cover slides 1 through **37** at the Plenary on January 12, 2012. The rest can be found in the Appendix (Additional Slides).
- Please go through the remaining slides carefully, and feel free to ask questions following the meeting.



Special Thanks

- I/UCRC Planning Committee
- Lindsey McGowen of NCSU
- Prof. Denis Gray of NCSU
- Drew Rivers of NCSU
- Other Directorates/Divisions within NSF



Program Update

Staff

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Program Update

- Revised I/UCRC Solicitation (NSF 12-516)
- Important Dates
- A Few I/UCRC Success Stories
- In Process – Assessment of I/UCRC Economic Impact; Studies on I/UCRC Impact on Lives of Center/Site Directors, Graduated Centers; and LIFE forms
- Innovation Corps (I-Corps): NSF 11-560
- New ENG Innovation Solicitation: Accelerating Innovation Research (AIR); NSF 12-511; [see Appendix](#)
- Fundamental Research Supplement opportunity : NSF 11-570; [see Appendix](#)
- SBIR Membership opportunity (NSF 09- 065): [see Appendix](#)
- Collaborative Opportunity for Research Between I/UCRCs (CORBI); NSF 11-074; [see Appendix](#)
- Budget Impact



Revised Solicitation: Differences Amongst Solicitations



Differences amongst Solicitations (YRS 1 – 5)

Features	08-591	09-565	10-595	12-516
Membership Per site	\$150k /(3)	\$150k / (3)	\$150k / (3)	\$150k / (3)
Membership/ center	\$300k	\$300k	\$300k	\$300k
Funding opportunities (YRS)	1 - 10	YRS 11 through 15	YRS 11 through 15	YRS 11 through 15
NSF funding	\$55k – \$80k	\$55k – \$80k	\$55k – \$80k	\$60k - \$80k
In-kind support from industry	RESTRICTED	RESTRICTED	RESTRICTED	RESTRICTED
Evaluator support for planning grants	No	Added (\$3k)	Added (\$3k)	Added (\$3k)
Evaluator support for established Centers	Added (up to \$21k)	Added (up to \$21k)	Added (up to \$21k)	Added (up to \$21k)

**READ SOLICITATIONS FOR ADDITIONAL
& DETAILED INFORMATION**



Differences amongst Solicitations (YRS 1 – 5)

Features	08-591	09-565	10-595	12-516
Planning grant , Phase II & Phase III expectations	None specified	None specified	Very specific expectations	Very specific expectations
Evaluator participation	Yes (bi-annually)	Yes (bi-annually for Phases I,II; annually for III)	Yes (bi-annually for Phases I,II; annually for III)	Yes (bi-annually for Phases I,II; annually for III)
Cost sharing	Yes	Yes	Yes	Yes
Additional support for lead institution	\$10k /site for I & II	\$10K/site for I & II; \$25k for Phase III	\$10K/site for I & II; \$25k for Phase III	\$10K/site for I & II; \$25k for Phase III
Center Operations / Communications	NA	NA	NA	\$20k in YRS 1,2; \$10K in YRS 3-5
International Collaboration & support	Yes (\$25k)	Yes (\$25k)	Yes (\$25k)	Yes (\$25k)
Added Center Director support (>8 sites)	Yes (\$50k)	Yes (varies)	Yes (varies)	Yes (varies)

**READ SOLICITATIONS FOR ADDITIONAL & DETAILED
INFORMATION**



Have You Noticed These Changes?

- Phase I funding level increased by 20% & 14%, respectively, based on membership fees
- Phase II funding level increased by 60% & 71%, respectively, based on membership fees
- Planning grant funding level increased by 15%
- Implemented
 - Phase III
 - Boot camp for planning grant awardees
 - Supplement funding for International Sites
 - Support fund for center evaluator during planning grants
 - Funding for center operations & communications
- Increased (funding) opportunities via:
 - Fundamental Research Proposals
 - Accelerating Innovation Research
 - i6 Challenge
 - I-Corps
 - Others



Program Update: Important Dates to Remember



Important Dates

- **CORBI – by February 3, 2012**
- **I/UCRC SBIR membership – open FY 12**
- **Fundamental Research Program – February 1, 2012**
- **New Proposals including Center Renewals under NSF 12-516 for anticipated FY 12 start dates – by March 6, 2012**
- **Annual reports (for continuing grants funded in FY 12) must be in by July 31, 2012**
- **Other dates and news are sent through the ListServe (see IUCRC homepage)**



Program Update: I/UCRC Success Stories & Others



A Few I/UCRC Success Stories (*Center Involvement*)

- Accelerating Innovation Research (AIR) Awards; FY 2011:
 - ❑ Water and Environmental Technology (WET); Temple University
 - ❑ Next Generation Photovoltaics (NGPV); Colorado State University
 - ❑ Center for Child Injury Prevention Studies (CChIPS); Children's Hospital of Philadelphia
- Innovation Corps Awards; FY 2011
 - ❑ Laser and Plasma for Advanced Manufacturing (LPAM); University of Virginia
 - ❑ Connection One (C1); Rensselaer Polytechnic Institute
- 25th Anniversaries celebrated by I/UCRCs
 - ❑ Berkeley Sensor & Actuator Center (BSAC)
 - ❑ Security and Software Engineering Research Center (S²ERC)
 - ❑ Center for Non-Destructive Evaluation (CNDE)



A Few I/UCRC Success Stories (*Center Involvement*)

- I/UCRC International Sites; FY 2011:
 - ❑ Center for Resource Recovery and Recycling (CR3); with Katholieke University (KU) Leuven in Belgium.
 - ❑ Center for Advanced Knowledge Enablement (CAKE); with Dubna International University in Russia
- I/UCRC Technology Showcase Events
 - ❑ CELDi (Virginia Tech) and Air Liquide
 - ❑ CChIPS with Britax Child Safety, Inc, State Farm, National Highway Transportation Research Center and Traffic Safety Administration



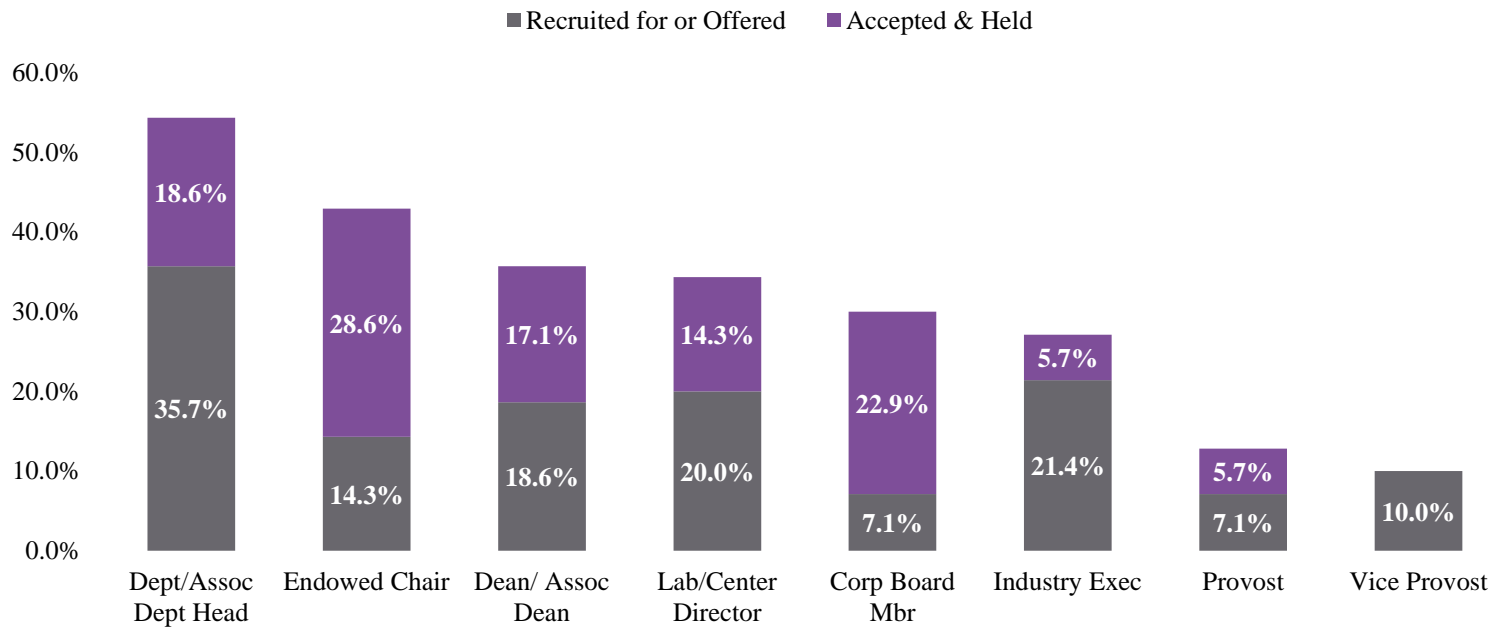
I/UCRC Impact: Career Opportunities &
Economic Impact
+
Graduated Centers



Career Opportunities

Since beginning your role as IUCRC director, what positions were you recruited for or offered, and what positions did you accept?

Career Impacts on Former Directors and Current Directors with 5+ Years of Service in the Role (n=70)



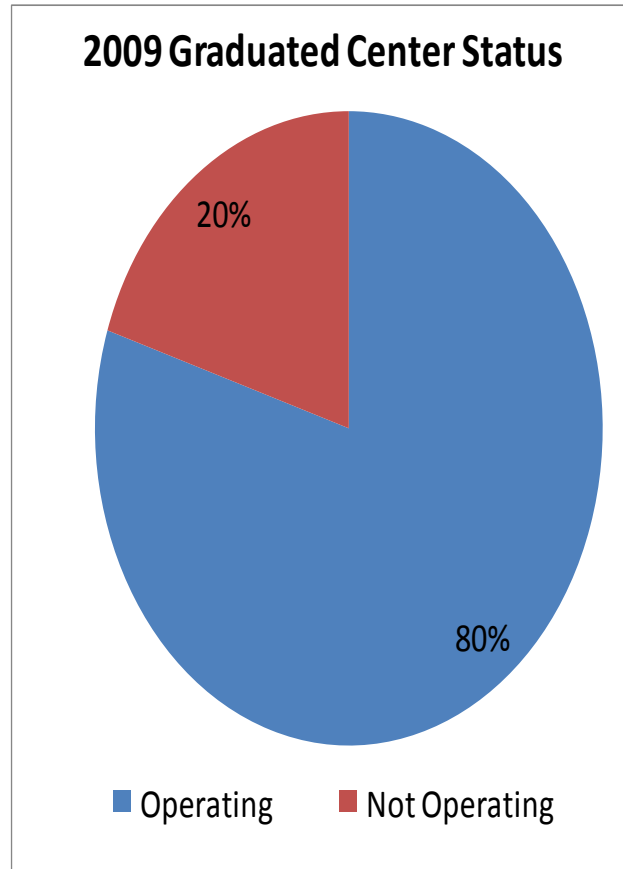
Aggregate Cases

- Retrospective impacts total nearly \$1.27B, with a net present value of \$1.25B.
- Each dollar invested by NSF-I/UCRC generated an estimated 64.7 dollars in impacts.

IUCRC investments & Impacts	TOTAL	IMS	BSAC	IUCS
Estimated impacts (present value)	\$1267.1M	\$846,738,946	\$410,727,849	\$9,638,633
Total investments (present value)	\$19.6M	\$3,133,857	\$13,250,712	\$3,203,057
Benefit:Cost Ratio	64.7:1	270.2:1	31.2:1	3.0:1
Net Present Value	\$1247.5M	\$843,605,090	\$397,477,137	\$6,435,577



Graduated Centers: Post-funding Status



2012 Graduate IUCRC Study:

- Determine the Current Status of graduated IUCRCs
- Examine changes in sustainability over time
- Explore strategies for sustainability including adaptation and reinvention
- Examine Industrially relevant predictors of post-funding sustainability

Study Progress:

- Data collection underway
- Response rate so far: 22.5%
- Goal: 100%

80% of centers...completed 10 yrs...sustained as of 2009



New Funding Opportunities for I/UCRCs



I-Corp (Background): NSF 11-560

- Leveraging NSF-lineage of previous support
- Small grants to focus on creating a commercialization roadmap
- Nimble funding – Quick assessment
- Team-based – Commercialization is team effort
- Process-oriented - Curriculum-focused



AIR: Accelerating Innovation Research

NSF 12-511

- **Core**

- NSF-funded research consortia
- Others: another research entity, small business consortium, local/regional innovation entity

- Third-party investment (1:1)

- **Focus**

- Creates innovation ecosystem
- Translates research discoveries to commercial reality
- Builds new partnerships
- Encourages spin-offs
- Develops entrepreneurial culture

- **Additional review criteria**

- Quality of the strategic plan, milestones, and deliverables
- Effectiveness of the plan to translate research and/or technology
- Commitment of partners, third party investors, and stakeholders
- Effectiveness of the partnerships in catalyzing an innovation ecosystem
- Quality of the management plan
- Effectiveness of the assessment plan
- Net added value to the students

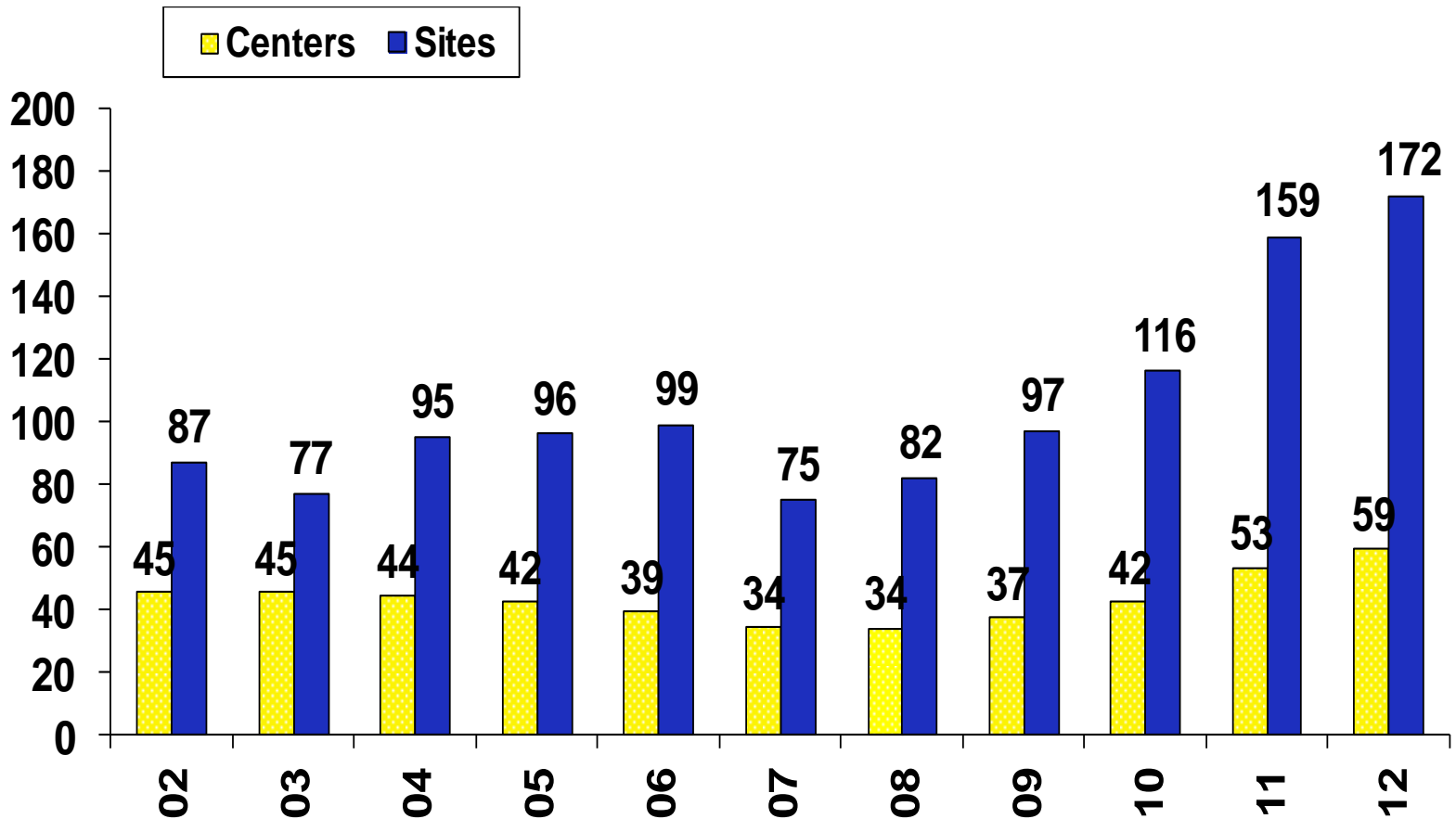


EXISTING CENTERS & SITES

POTENTIAL CENTERS & SITES



Active Centers and Sites By Year



**43 ENG (124 SITES) & 16 CISE (48 SITES);
INCLUDES PHASE III & NCE CENTERS**



Industry/University Cooperative Research Centers

ENG Multi-University Centers

1. Advanced Forestry
2. Advanced Packaging and Processing (III)
3. Bio Energy R & D
4. Composites Infrastructure
5. Ceramics Composites Optical Materials Center
6. Computational Materials Design
7. Design of Analog Digital Integrated Circuits (III)
8. Dielectrics
9. Electromagnetic Compatibility
10. Energy Harvesting
11. Friction Stir Processing
12. Fuel Cells
13. Grid-Connected Adv Power Elec
14. Health Org. & Transformation
15. Integrative Joining of Materials for Energy Applications
16. Laser and Plasma for Adv. Mfg.
17. Logistics and Distribution
18. Membrane Science, Engineering & Technology
19. Next Generation Photovoltaics
20. Particulate and Surfactants
21. Pharmaceutical Development

ENG Multi -University Centers

22. Plug-In Hybrid Electric Vehicles
23. Precision Forming
24. Power Systems Engineering Research Center (III)
25. Resource Recovery & Recycling
26. **Sensors and Actuators (III)**
27. Smart Vehicles Concepts
28. Silicon Solar
29. Advanced Space Technologies
30. Connection One
31. Water and Environmental Technology
32. Water and Equipment Policy
33. Wood Based Composites
34. **Metamaterials**
35. **Biophotonic Sensors and Systems**
36. **Advanced Non-Ferrous Structural Alloys**
37. **Energy Efficient Systems**
38. Child Injury Studies

ENG Single-University Centers

39. **Agricultural, Biomedical, and Pharmaceutical Nanotechnology**
40. Advanced Cutting Tools
41. Advanced Vehicle Electronics (III)
42. Electronic Micro-Cooling
43. Non-Destructive Evaluation (III)

43 ACTIVE ENG CENTERS



Industry/University Cooperative Research Centers

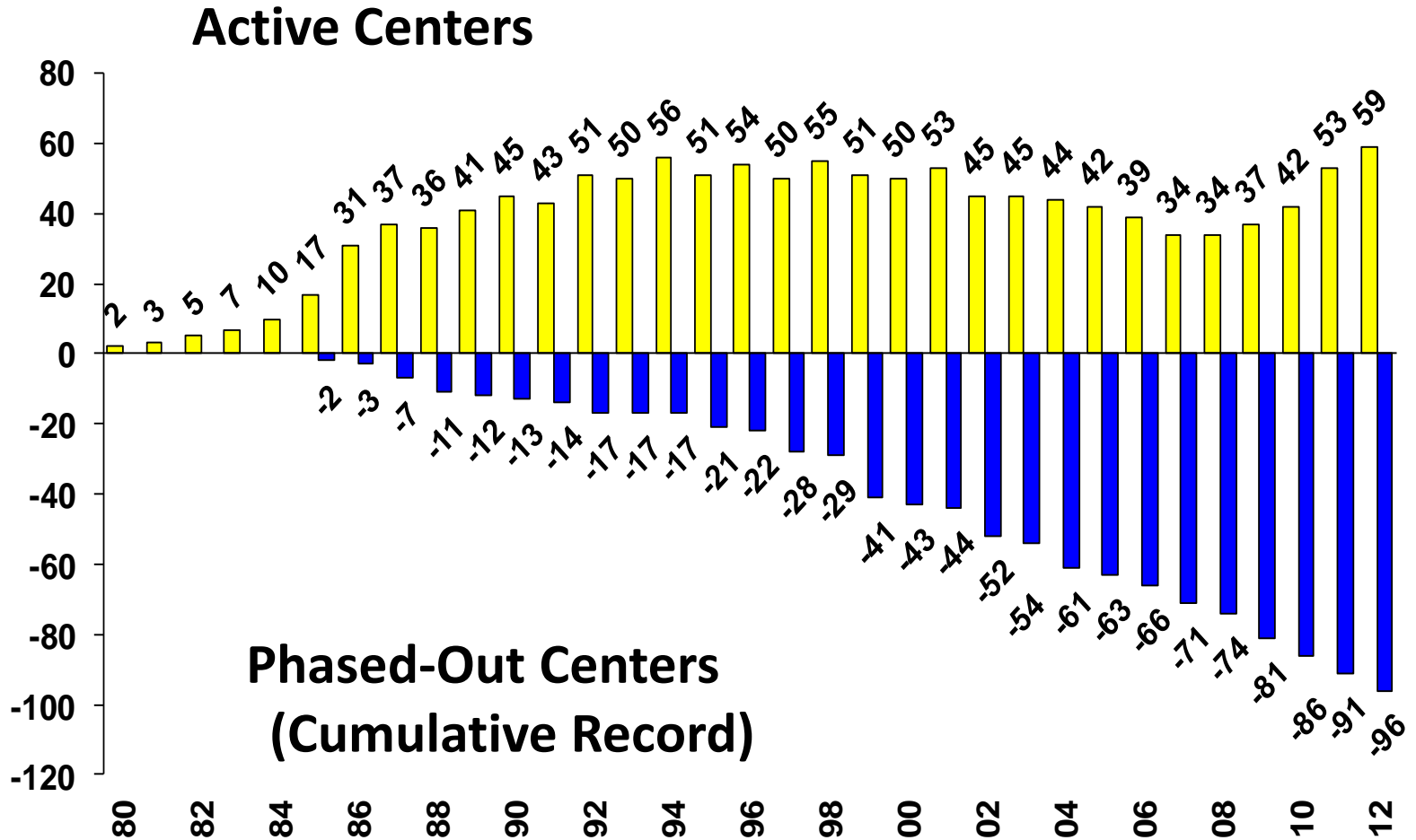
CISE Multi-University Centers

1. Advanced Knowledge Enablement
2. Autonomic Computing
3. **Dynamic Data Analysis**
4. e-Design
5. Embedded Systems
6. Experimental Computer Systems
7. Hybrid Multicore Productivity
8. Identification Technology
9. Intelligent Maintenance
10. Intelligent Storage
11. Net-Centrics Systems
12. Reconfigurable Computers
13. Search & Rescue Robots
14. Security and Software Engineering Research Center
15. Surveillance Theory
16. Wireless Internet

**16 ACTIVE COMPUTER AND INFORMATION
SCIENCE AND ENGINEERING (CISE) CENTERS**



Center Life Cycle



New Sites Joining Existing ENG IUCRCs (FY 2011)

- Center for Child Injury Prevention Studies (CChIPS)
 - *Ohio State University*
- Center for Excellence in Logistics and Distribution (CELDi)
 - *University of California-Berkeley*
- Center for Health Organization and Transformation (CHOT)
 - *Pennsylvania State University*
- Next Generation Photovoltaics (NGPV)
 - *University of Texas at Austin*

4 SITES ADDED TO ENG CENTERS



New Sites Joining Existing CISE IUCRCs (FY 2011)

- *4 sites added to existing CISE centers*
- *Detailed information from Rita Rodriguez*



Planning Grants Awarded (FY 2011)

- **Painting/Coating Application and Surface Inspection Systems***
 - *University of Kentucky & Clemson University*
- **Macromolecular Topology***
 - *University of Cincinnati & University of Michigan*
- **2 awarded to CISE; detailed information from Rita Rodriguez**
- **One site joined an existing CISE Center; detailed information from Rita Rodriguez**

***POTENTIAL FOR 4 NEW CENTERS:
2 ENG, 2 CISE**



Full Proposals for Centers Under Consideration (FY 2012)

- **Optical Wireless Applications**
- **Tire Research**
- **Sustainably Integrated Buildings and Sites**
- **2 new CISE Centers (Detailed information from Rita Rodriguez)**
- **1 CISE Center Phase II renewal (Detailed information from Rita Rodriguez)**

Potential for 3 NEW ENG & 2 NEW CISE Centers



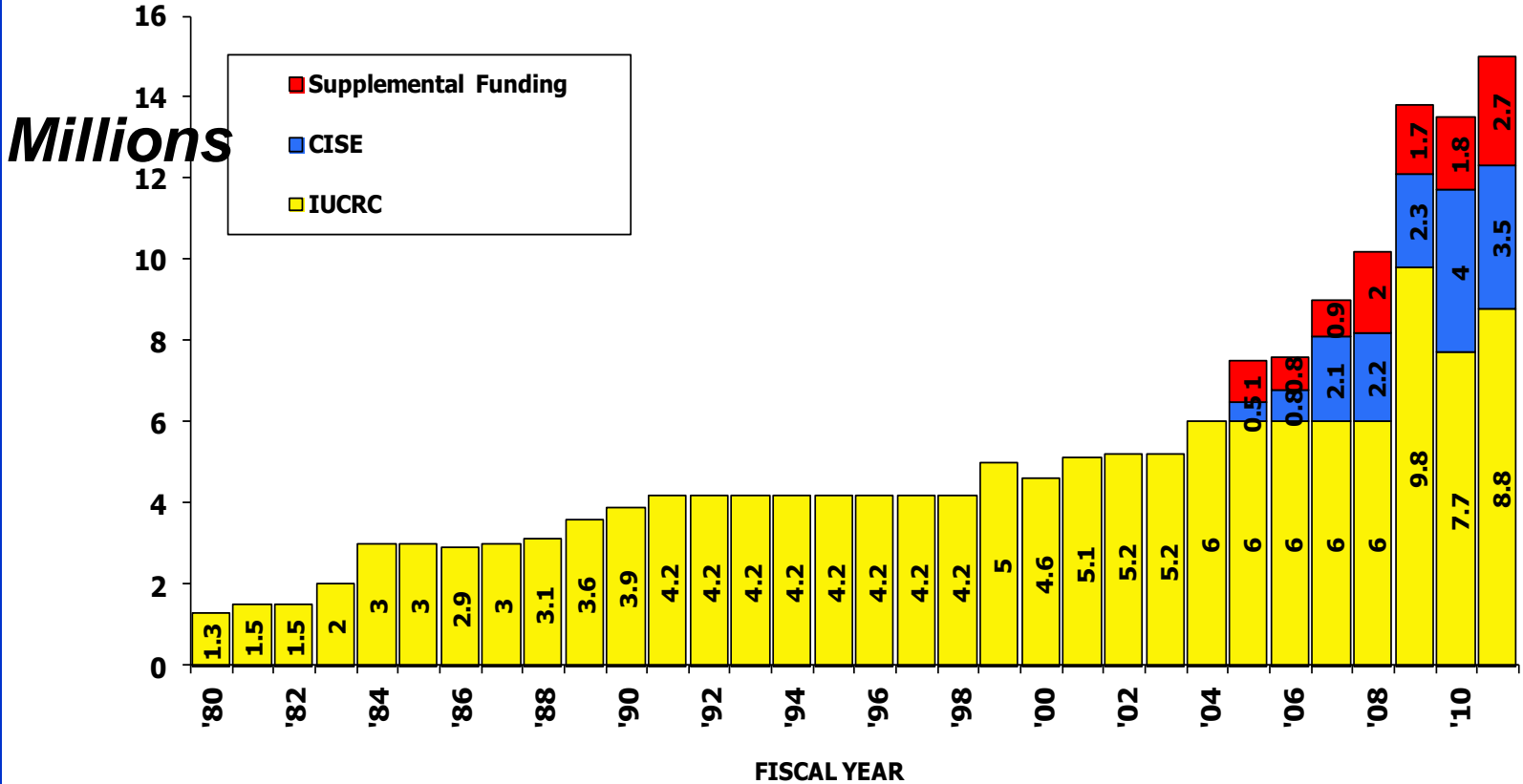
NSF FUNDING

TOTAL FUNDING BY SOURCE

INDUSTRIAL MEMBERSHIP BY YEAR



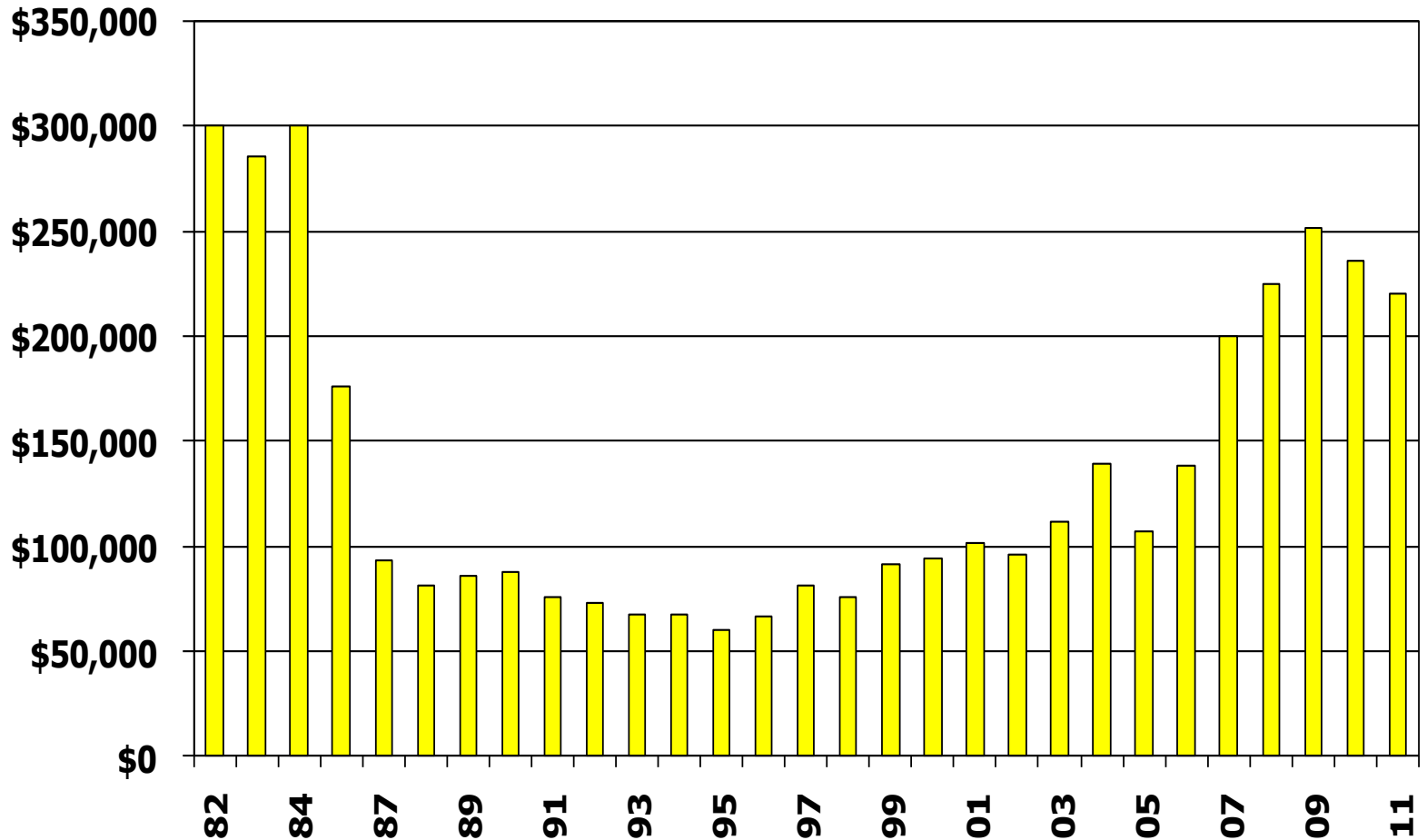
NSF Budget By Year



- Fundamental Research Proposals (CISE 1.7M, ENG 1M)
- ENG; includes CGs, RETs, REUs, others
- CISE; ; includes CGs, RETs, REUs, others



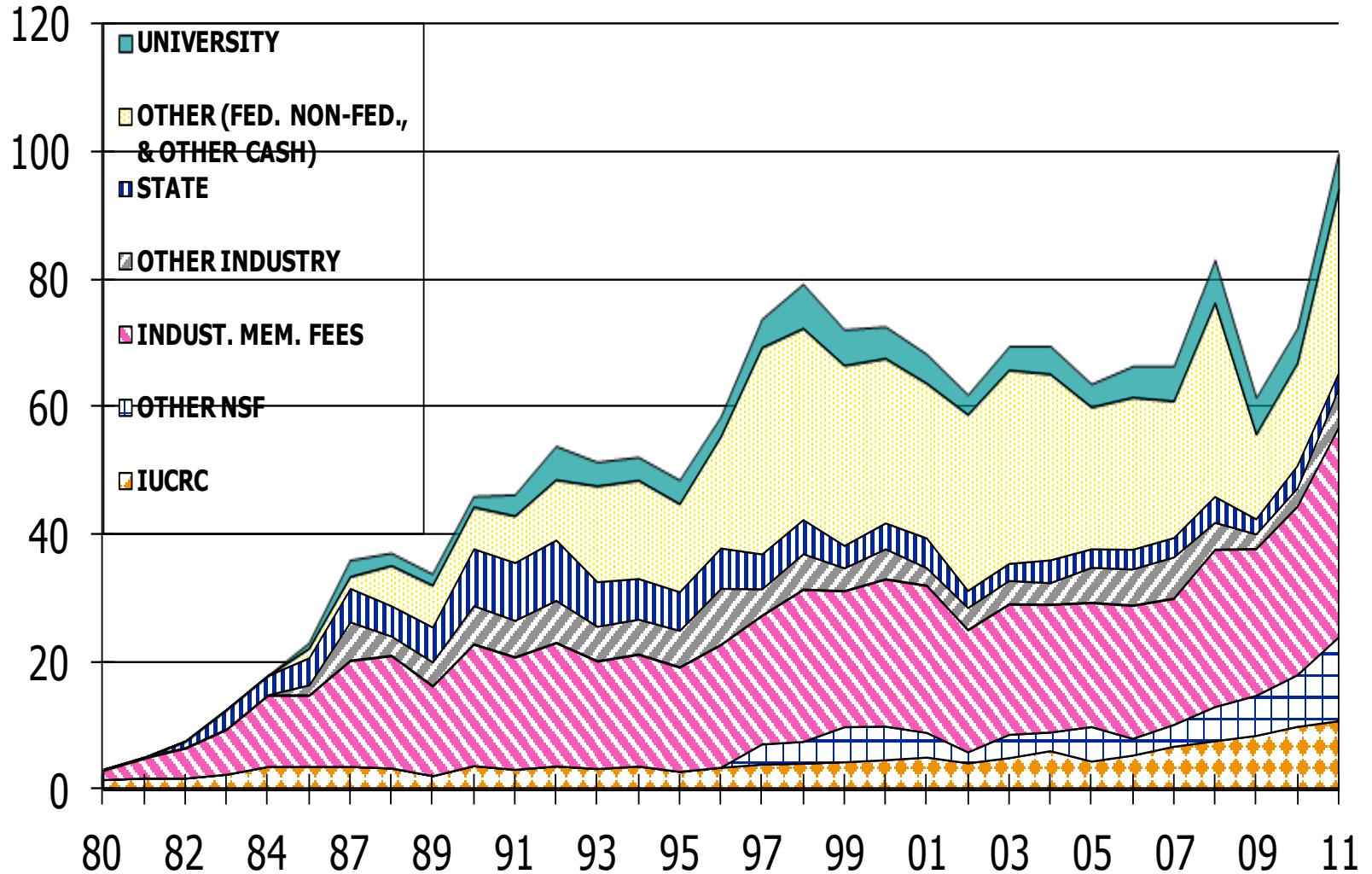
Average NSF IUCRC Funding Per Center



**Decline in average funding:
more sites at \$150k, sites transitioning from Phase I – II - III**

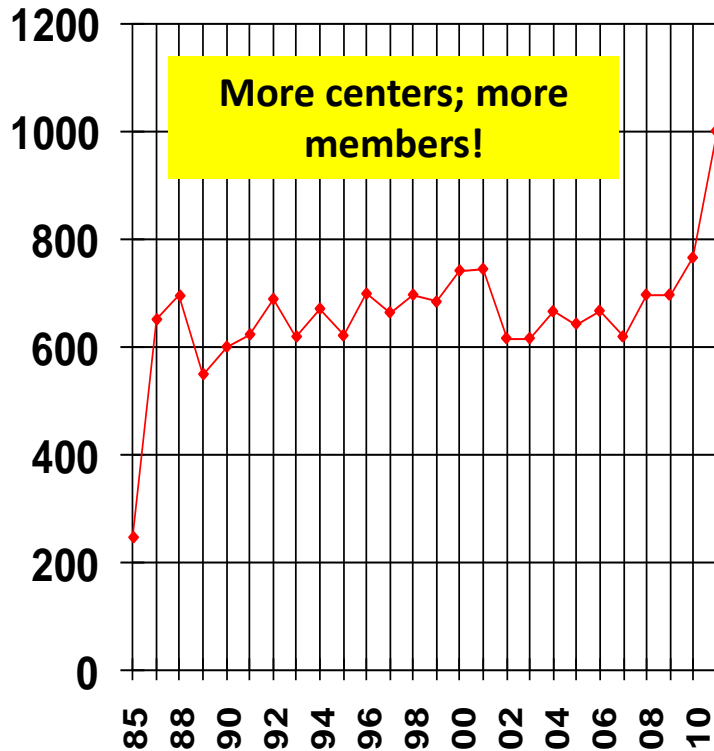


Total Funding by Source by Year in Dollars

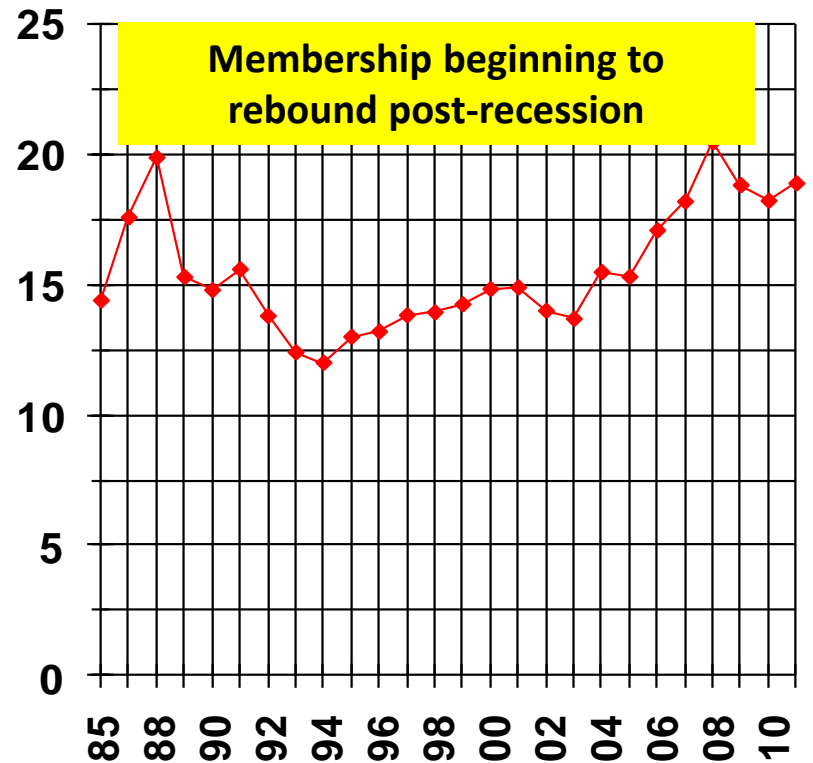


Industrial Memberships By Year

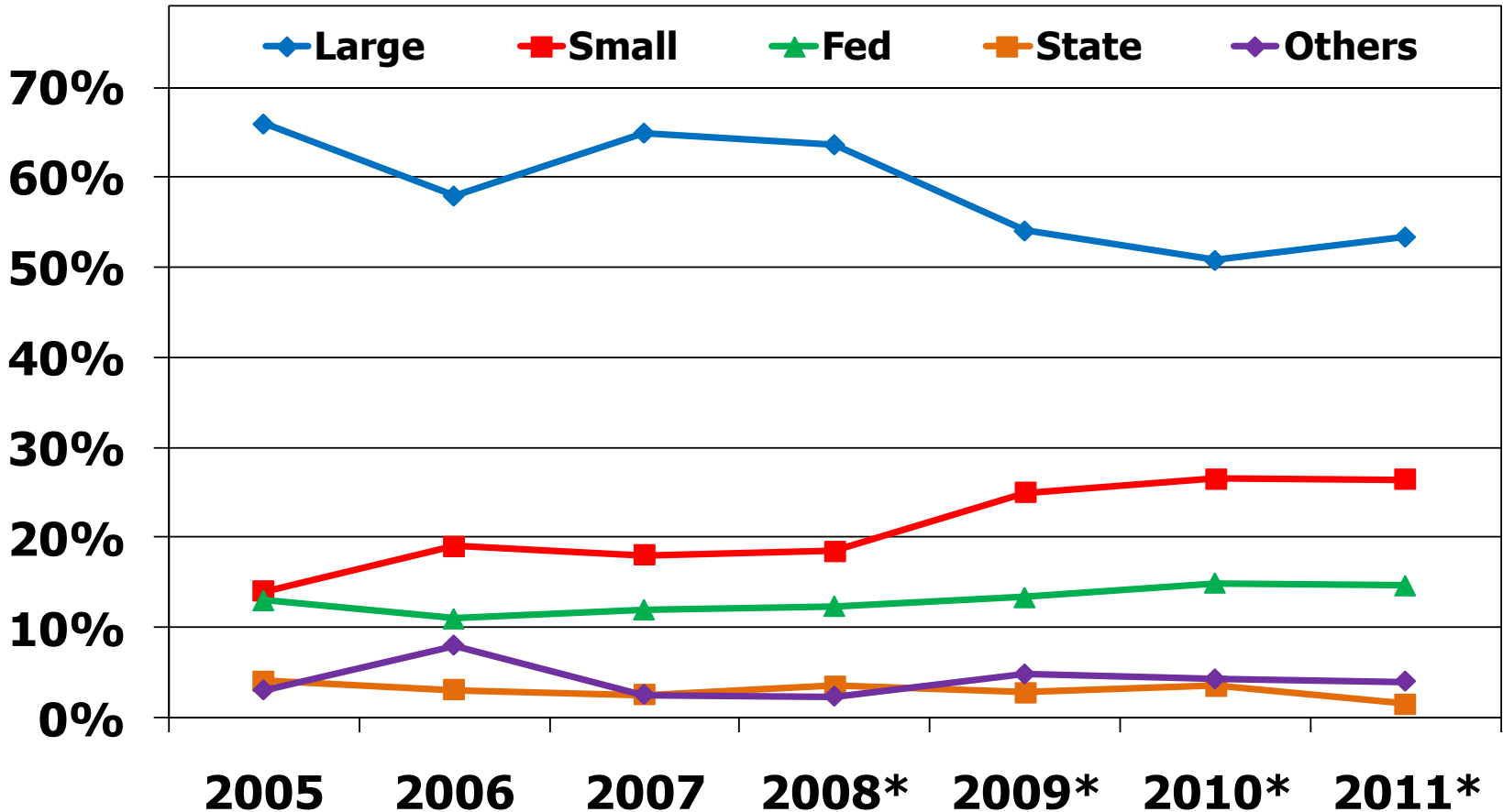
TOTAL NUMBER OF MEMBERS



AVERAGE NUMBER OF MEMBERS PER CENTER



Member Composition 2005-2011



* Years with Advanced Forestry excluded as a small business outlier: '08 Small = 36, '09 Small = 49, '10 Small = 57, '11 Small = 66

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

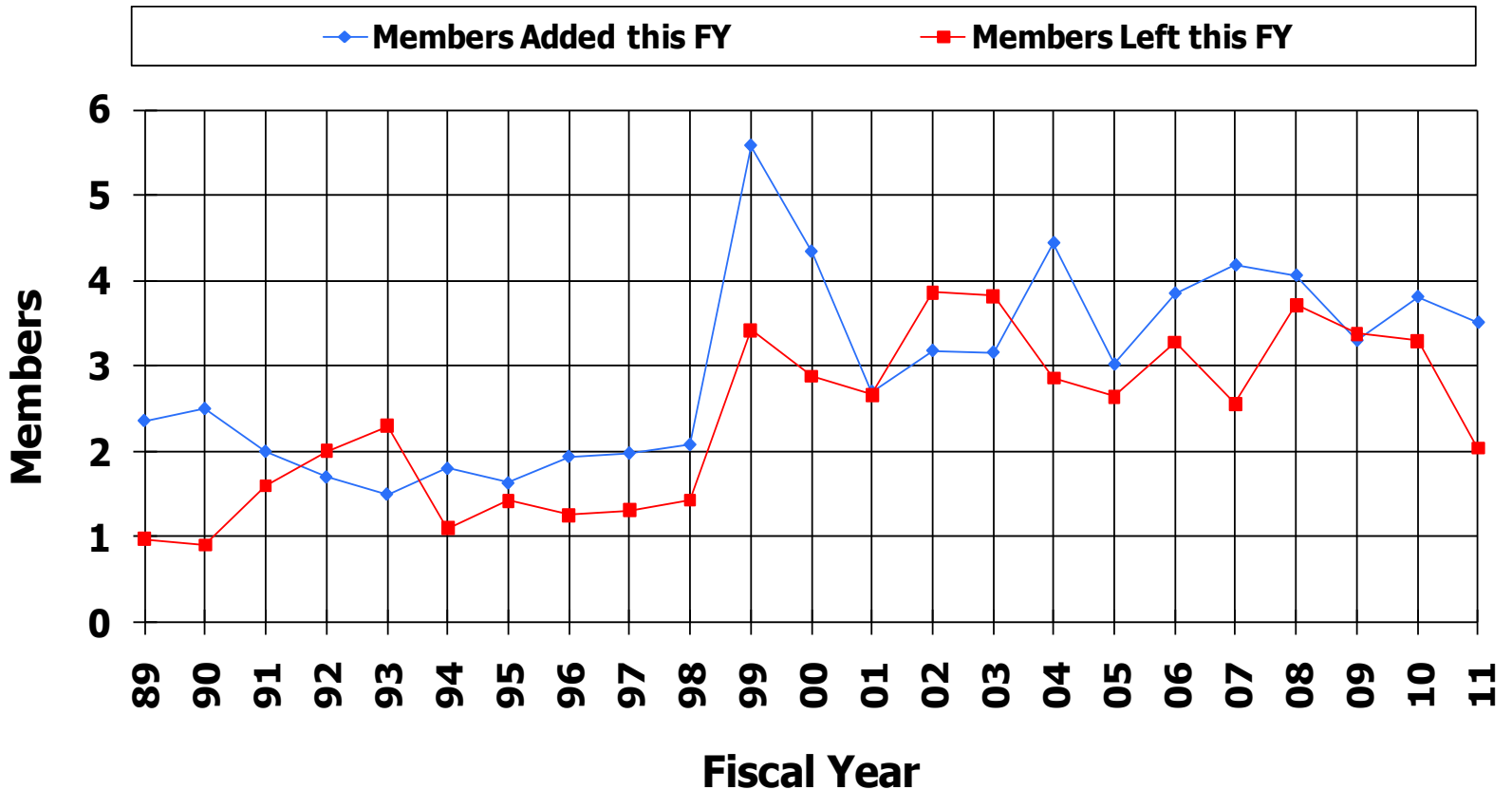


Average Membership Turnover

NEW CENTERS EXCLUDED

Lines crossing: natural recession!

Continuing centers appear to have more than held their own



**CORBI, SBIR Membership in IUCRCs,
MIPRs, International Collaboration,
REUs, RETs**

&

Fundamental Research Proposal

SEE APPENDIX



MIPR and Interagency Funding

- **Simply ask agencies to visit**
 - www.nsf.gov/eng/iip/iucrc/mipr.jsp for detail
- **Means for recruiting federal government agencies as center members**
- **Handles problems for agencies to seek sole source justifications**
- **Agencies do not need to sign membership agreement**
- **Can be as simple as submitting a procurement document for agency**
- ***NSF is authorized to deduct 6.51% (based on the total transaction) for administrative cost recovery.***



APPENDIX WITH ADDITIONAL SLIDES



Collaborative Opportunity for Research Between IUCRCs (CORBI): NSF 11-074

- **Supplement:**
 - for collaborative research projects between IUCRCs
 - projects to have industrial significance
 - projects to be endorsed with a portion of industry funds at Centers
 - projects should provide the potential for transformative research
 - IAB approval of the CORBI project is required
- **Supplement Due Date:** February 3, 2012 by 5:00 PM
- **Project Duration:** One or two years
- **Limit on the Number of Supplements:** None
- **Eligibility:**
 - meets membership requirements
 - Has updated Center information on NSF website
- **Award Information:**
 - up to \$100,000 for a two Center project with up to \$50,000 per Center



Fundamental Research Program for IUCRCs (NSF 11-570)

- **Industry-defined fundamental research**
 - Broadens the scientific and engineering understanding
 - Industry participation helps drive innovation
 - Proposals must discuss benefits for current industry members while charting a path for potentially new and emerging research directions
 - Proposals must demonstrate measurable industry collaboration and involvement
 - Centers must be in good standing
- **No longer a supplement; one integrated proposal per Center (collaborative)**
- **Deadline: February 1, 2012 by 5 PM**
- **Award amounts**
 - \$50,000 to \$200,000



SBIR/IUCRC Memberships (NSF 09-065)

- **Proposal window: None**
- **SBIR/STTRs can obtain a full I/UCRC membership**
- **NSF SBIR/STTRs can join multiple I/UCRCs**
 - Limit of 2 memberships per Phase II award
- **Centers can accept multiple NSF SBIR/STTRs**
- **Endorsement letter from site director is required.**
- **SBIR/STTRs apply for a supplement when:**
 - They have an active **NSF** SBIR/STTR Phase II & IIB award
 - Companies may join an active or graduated I/UCRC (within 5 years of the supplement request) that remain committed to I/UCRC principles
- **I/UCRCs apply for a supplement when:**
 - The I/UCRC has a current center award, AND
 - When the NSF SBIR/STTR Phase II & IIB is graduated (within 5 years of the supplement request).



SBIR/IUCRC Memberships (cont'd)

- **Supplements for one or two year memberships are considered**
- **Memberships:**
 - SBIR pays \$5, 000 per year for centers membership at \$50,000 or less, or
 - 10 percent of the I/UCRC membership fee for centers with membership fees greater than \$50,000
 - NSF funds the balance. NSF dollars cannot be use in computing center membership fee certifications.
- **For SBIR/STTR members (see search instructions within NSF 09-065).**

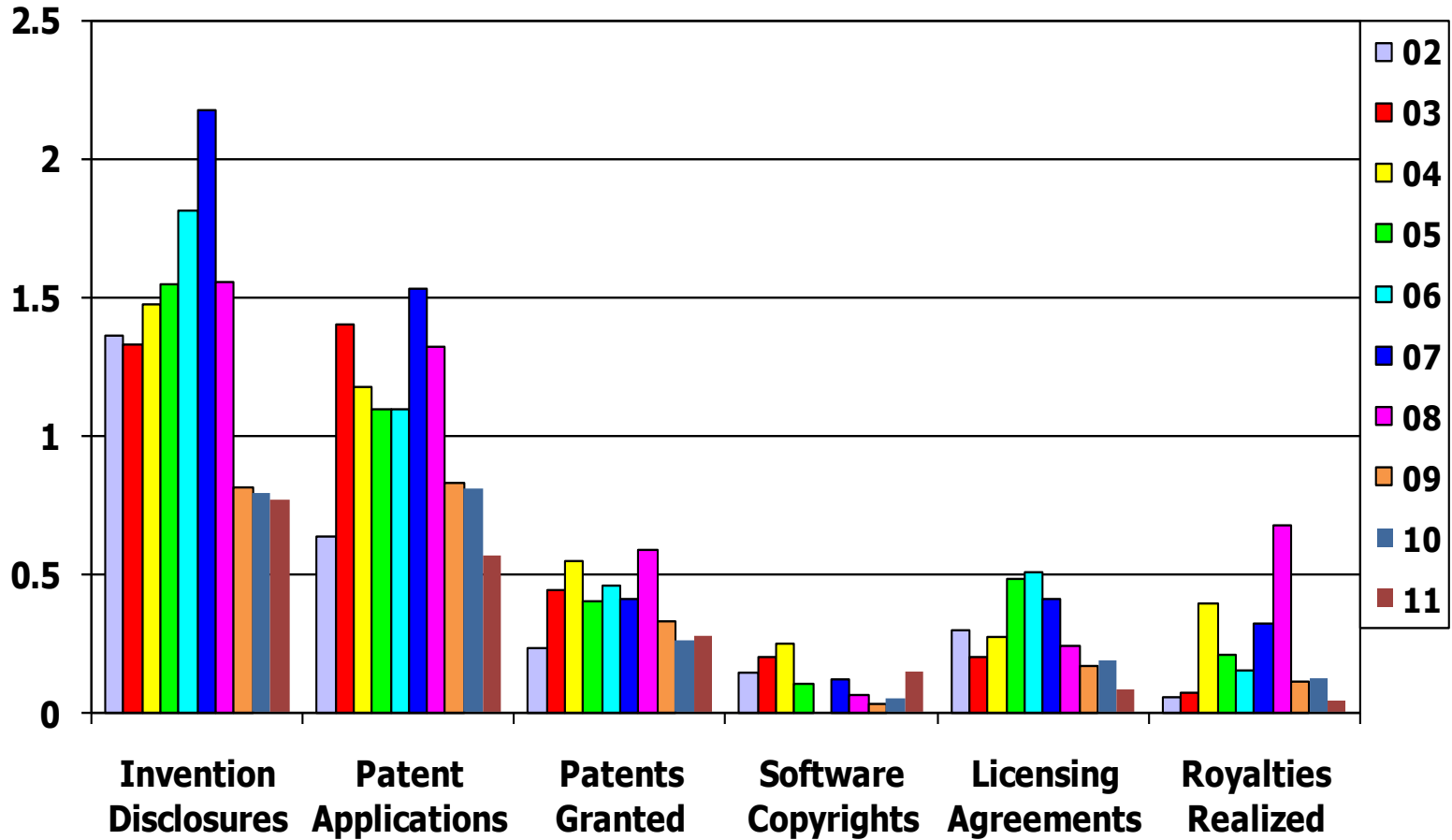


International Collaboration

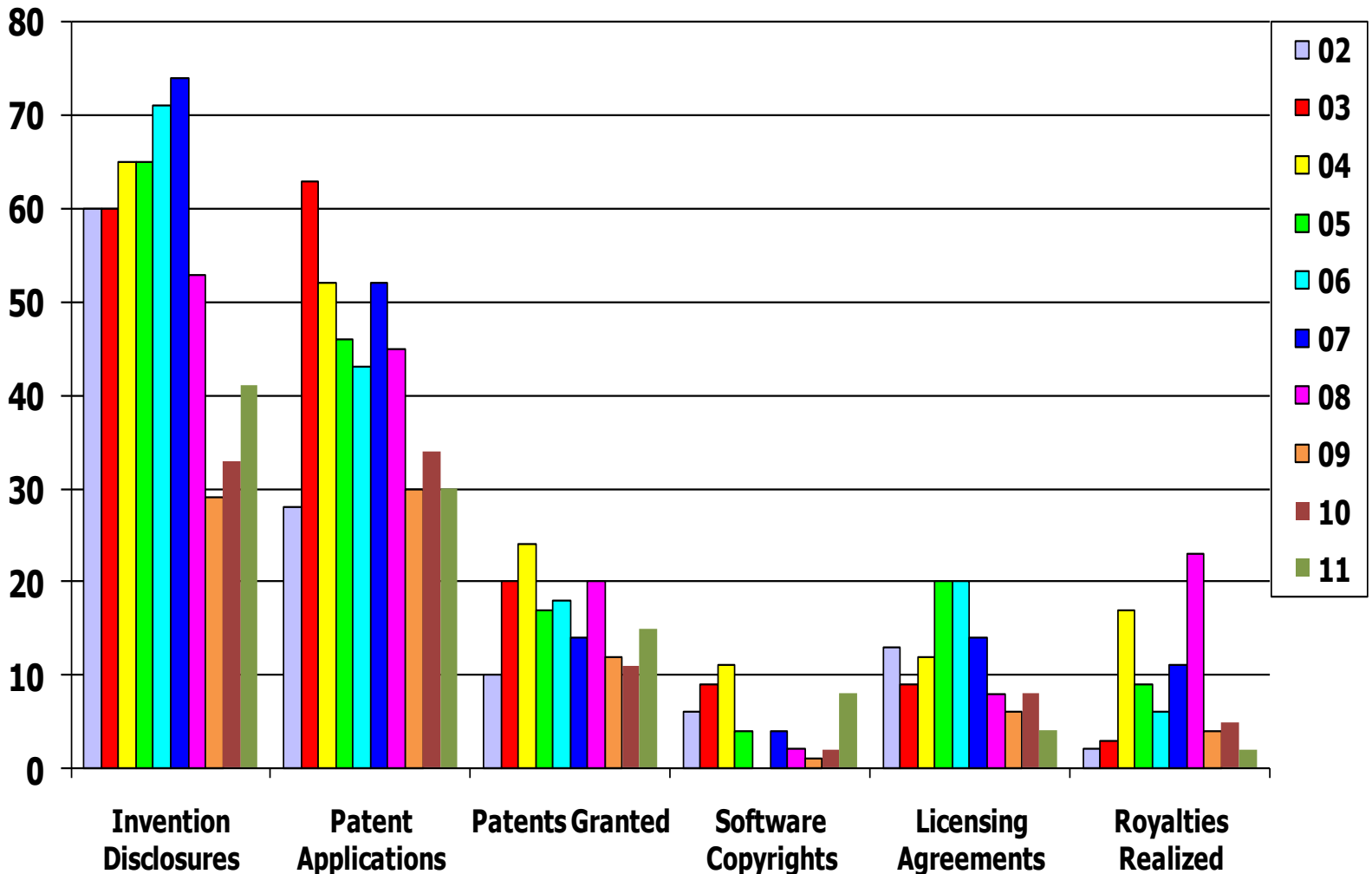
- Plan to interact with the foreign research site & description of the proposed research project(s)
- Evidence that the international site will have the money for research;
- Description of the infrastructure that is in place to enable collaboration
- Formal (signed) agreement between the foreign and U.S.-based site that replicates the provisions for IP, copyrights, publication delays, and similar issues identified in the U.S.-based center membership agreement; and
- Letter from the Industry Advisory Board (IAB) that endorses the international collaboration and proposed research projects.
- ***Mutual benefits, true intellectual collaboration with the foreign partner(s), benefits to be realized from the expertise and specialized skills, facilities, sites and/or resources of the international counterpart, and active research engagement of U. S. students and early-career researchers, where such individuals are engaged in the research.***
- The US research site may receive a \$25,000 supplement annually for international collaborations; these funds are to be used for expenses related to the international collaboration including site director(s) and evaluator international travel, and support for research visits by U. S. students and junior researchers. No NSF funds are to be used by non U.S. participants



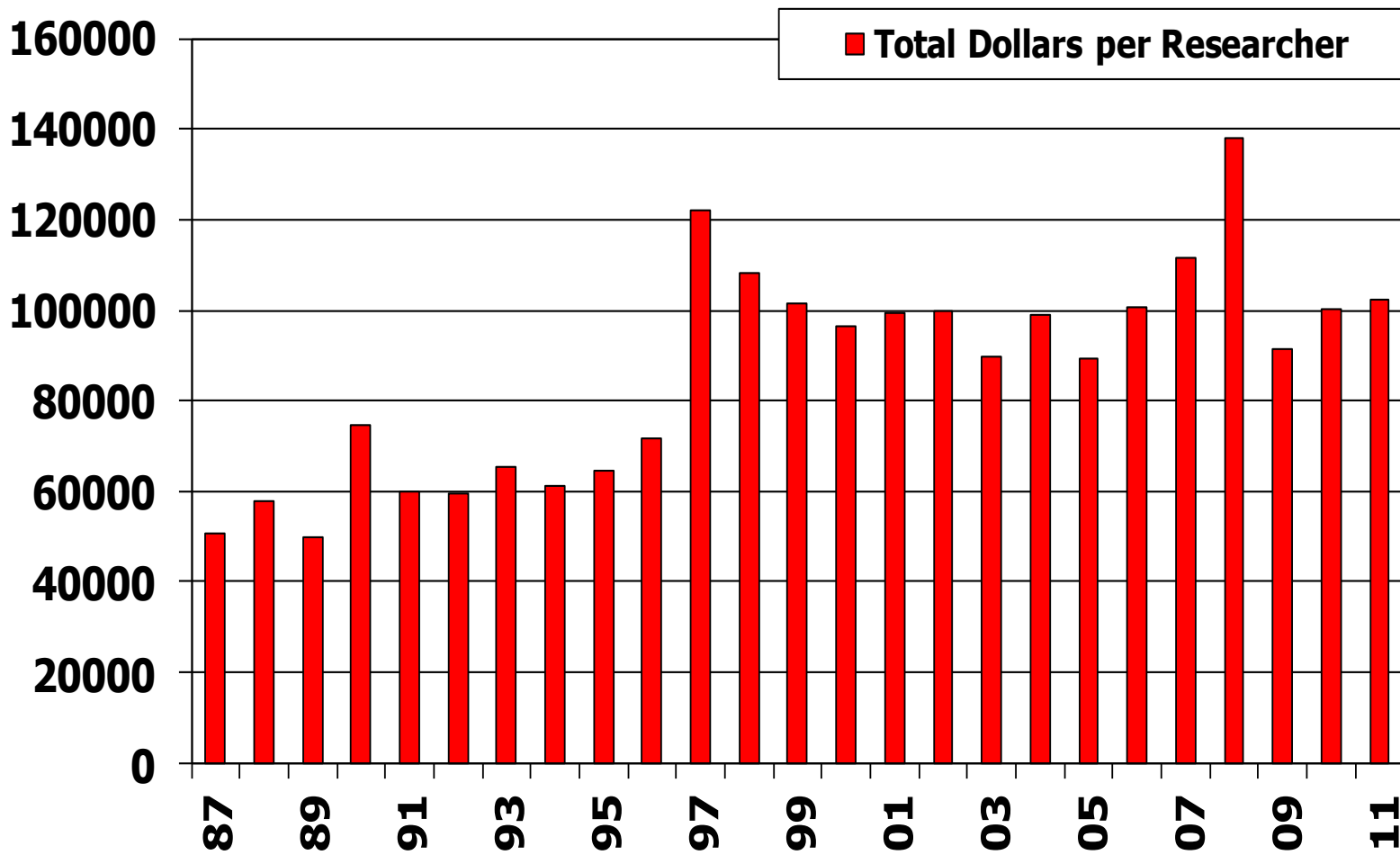
AVERAGE NUMBER OF INTELLECTUAL PROPERTY EVENTS 02-11



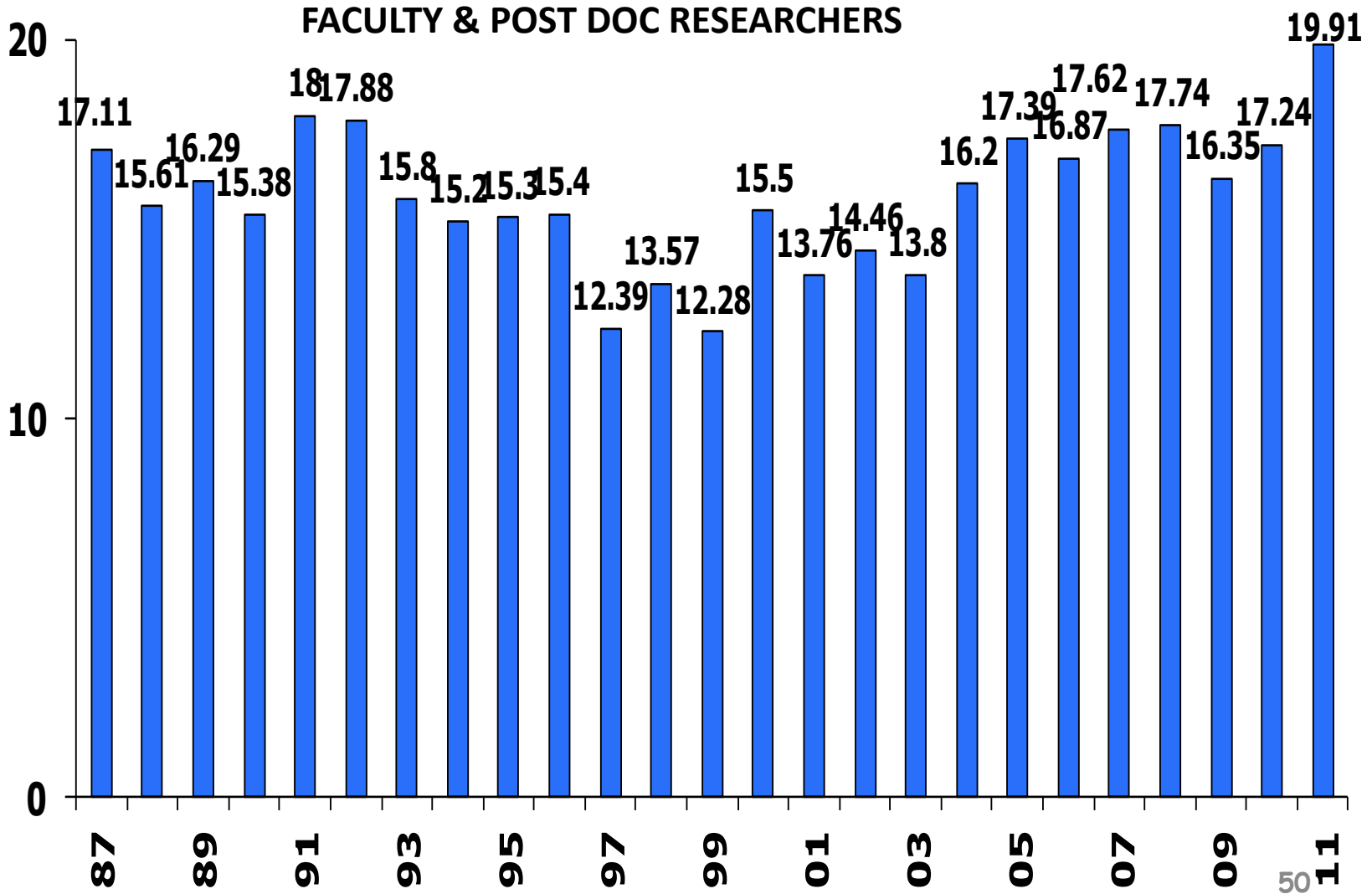
INTELLECTUAL PROPERTY EVENTS FY 02-11 TOTALS



FUNDING PER RESEARCHER TOTAL



AVERAGE NUMBER OF RESEARCHERS PER CENTER / BY YEAR



Total Funding by Source by Year in Percentages

