Breakout 3: Evaluators: Business Meeting and Update

NSF Program Briefing

2015 NSF I/UCRC Annual Meeting
Agenda Items:
1) Thank you
2) NSF expectations
3) FY15 snapshot
4) Evaluator Program “Business”
At a bare minimum, the evaluator is expected to:

1) Attend semi-annual evaluators' meetings (typically in January and June);

2) Attend semi-annual Industrial Advisory Board meetings; (if unable to attend an IAB meeting, please find a substitute evaluator) Lead and/or assist in the implementation of the LIFE feedback process. (Note: Phase III evaluators may elect to attend only one IAB meeting per year.)

3) Prepare an "Evaluator's Report," with cover sheet when a new Center is born and provide an annual narrative summary of significant Center developments for submission to NCSU and your Center Director; this must include an attempt to document Center success case study and/or economic impact assessment (See “Identifying and Documenting IUCRC Center Success Stories and Economic Impacts”).

4) Complete Semi-Annual Meeting Best Practice Checklist (word, & PDF versions) at each IAB meeting and attach to Annual Evaluator's Report for each I/UCRC.

5) Administer "process/outcome" questionnaires to faculty, and Industrial Advisory Board Members annually;

6) Prepare an annual report based on the process/outcome questionnaire data for your Center and submit to your Center Director;

7) Forward process outcome questionnaire data to the evaluation team at NCSU;

8) Provide information and feedback to NSF; and

9) Provide information and feedback to your Center Director.
As a reminder
Membership Requirements

• Single university center must have a minimum of $400,000 annually in membership fees with a minimum of eight full members.

• A multi-university Phase I center must have:
  
  a minimum of $300,000 annually in membership fees AND a minimum of six full members

  AND each site in the center must have:

  a minimum of $150,000 annually in membership fees AND a minimum of three full members.

For the first year of operation $150k must be all IN CASH. However, in-kind contributions (with NSF’s approval) may be allowed totally to no more than one full membership fee.
IUCRC Memberships

In Cash
Check to center/sites or via MIPR or IAA

In Kind
First year: Phase I totaling to no more than one full membership fee (with NSF’s approval)

Subsequent years/Phases: all in-kind contributions must be approved by the IAB

A member can buy more than two memberships but have the voting power equivalent to two memberships.

A member or multiple members can invest additional funding to accelerate center’s projects.
IUCRC Eligible Members

Private or public sector organizations:

- Private companies of any size
- Local, State, Federal agencies
- Trade organizations or associations (must sign addendum for Associations and Institutes)

Distinct entities/organization within the same company/agency count as individual members and buy individual memberships (example: GM Chrysler and GM Buick; Army Research Office and Army Weapons and Materials)
Quiz: right or wrong?

You can only count a maximum of two memberships toward your minimum requirement

Wrong

With 50k membership and 2 universities, it is not necessary to have 6 different members, 3 members with 2 memberships each would be acceptable

Wrong

Company A buys 50k in membership fee at each site of a center, this counts as ONE full member towards NSF minimum membership requirement, but company has TWO votes.

Company A Division X buys 50k in membership fee at one site, and Company A Division Y buys 50k in membership fee at the same or at another center site, this counts as TWO full members towards NSF minimum membership requirement.

Wrong

Always delegate NSF to answer to these questions as well as questions related to NSF policies, submissions, supplements, etc.
SRO Membership Certification New Form

This is editable – you can add columns if in NCE, or if you are certifying for all sites and needs to indicate which site, and you can remove the instructions, but you must provide the information requested.
Need your help with the following issues

1. Along with your Semi-Annual Meeting Best Practice Checklist, email us the updated cover sheet of the “Evaluators Report” after each IAB meeting.

2. Ensure that each center has active website and it is being updated periodically.

3. Check with the center admin and director that all the presentation material is posted in the secure section at least 3 days before the IAB meeting. Inform us if there is resistance in doing so from the center.

4. Before the planning meeting, a good website and brochure must be developed.
Critical mass at meetings

Make sure that center ensures the critical number of members in order to make meeting meaningful

Multi-institution centers with only 3-5 potential members at planning meeting, below the minimum membership requirement Phase, absence of one site is no worth anyone time (and money) and might be counterproductive.

Stay on top of the PIs and if you sense this will happen inform NSF immediately.

Travel budget is coming out of Program Budget!
Scheduling Your I/UCRC Meetings

1. Access the I/UCRC Public Calendar to determine if your preferred dates are available
2. Contact Kevin Simmons to confirm NSF availability and contact your evaluator
3. If your dates are confirmed, schedule your meeting

Please try to schedule your meeting immediately prior or after another meeting in the same town or State.

NSF is going Virtual!
Travel budget is coming out of Program Budget!
Where we are and FY15 snapshot

FY14:
Active and in NCE:
   52 ENG Centers 25 CISE Centers
   17 ENG planning 2 CISE planning
Ending (as of now, an handful are in trouble):
   ENG: 5 ending and in NCE (CNDE Shelly, CDADIC Scott, CAVE Davis, PSERC Doering, CBERD Gray) + at least two in big trouble

FY15:
First round:
ENG: received 60 proposals or 29 projects – anticipates funding about 25% which will require just two evaluators
CISE: anticipates the need for three evaluators
Evaluator Program “Business”

1) Numbers and recruiting strategy
Other items......
IUCRC PROGRAM
FINDINGS FROM THE
CENTER STRUCTURE DATABASE

DRAFT RESULTS: FY 2013-2014
*Data collected from 65 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
Overview

• Full Slide Deck on IUCRC Evaluator website: [www.ncsu.edu/iucrc](http://www.ncsu.edu/iucrc)

• Overview
  • Number of Centers and Funding
  • Membership
  • Outcomes: IP Events and Students
  • ENG vs. CISE comparison
  • Comparison by Phase
### Understanding Center Count and Activity Statistics

**FY 2014**

<table>
<thead>
<tr>
<th>66 NSF Funded Centers &gt; 1 yr. (completed a project year)</th>
<th>11 NSF Funded Centers &lt; 1 yr. (no project year completed)</th>
</tr>
</thead>
</table>

= 77 Funded Centers

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

NSF Fiscal Year

Oct FY1

Mar FY1

Aug FY1

Oct FY2

Mar FY2

Aug FY2

Center Project Year

IUCRC Report Completed

Center Project Year
Center Life Cycle*

(Data Current for NSF FY2014)

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

*Data Current for NSF FY2014

NSF-I/UCRC Center Structure Database

Slide 20
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

![Bar Chart showing Total Program Funding from 1980 to 2014]
Total Funding by Source in Dollars

- UNIVERSITY
- OTHER (FED. NON-FED., & OTHER CASH)
- STATE
- OTHER INDUSTRY
- INDUST. MEM. FEES
- OTHER NSF
- IUCRC

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

- Members Added this FY
- Members Left this FY

*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”

Near lowest turnover since 1998
Member Composition 2005-2014


^ Categories comprising Others include: non-profit, non-US govt, and other org.
Intellectual Property & Commercialization Events 04-14 Totals

54% of disclosures from 4 centers


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 = 0.98)
- PhD (2014 Mean = 1.35)
- BS (2014 Mean = 0.51)

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 Phase-based comparison
Over half of all centers are in Phase 1!
Total Program Funding

<table>
<thead>
<tr>
<th>Phase</th>
<th>Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1</td>
<td>$49,000,000</td>
</tr>
<tr>
<td>Phase 2</td>
<td>$44,000,000</td>
</tr>
<tr>
<td>Phase 3</td>
<td>$41,000,000</td>
</tr>
</tbody>
</table>
Average & Median Total Center Funding

Centers get larger over time.
Average NSF IUCRC Awards & Supplements

- Phase 2 centers getting rewarded

<table>
<thead>
<tr>
<th>Phase</th>
<th>Average Award Amount</th>
</tr>
</thead>
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<tr>
<td>Phase 2</td>
<td>$256,000</td>
</tr>
<tr>
<td>Phase 3</td>
<td>$244,000</td>
</tr>
</tbody>
</table>

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

Total Number of Memberships

Average Number of Memberships

Phase 1 | Phase 2 | Phase 3
--- | --- | ---
Phase 1 | Phase 2 | Phase 3

FY 2013-2014 NSF-I/UCRC Center Structure Database
QUESTIONS?
Evaluator Responsibilities and Updates

Denis O. Gray, Ph.D.
IUCRC Evaluation Team
NC State University
Evaluator Resources

https://www.ncsu.edu/iucrc/

“Dear Evaluator” Memo

- Dear Evaluators:
  
  Greetings from the evaluation team at NCSU! Hope your summer is going well, and you are ready for another stimulating year supporting the NSF IUCRC Program. The purpose of this message is to provide you some updates, alert you to some new developments related to the IUCRC Evaluation Project, and remind you about your responsibilities going into the fall. Here are some highlights of what is covered in more detail below (please read I.A-1.C now). As always, all project resources are available on our project website (www.ncsu.edu/iucrc).

- I.A. Highlights (see details below in Section II)

  - For 2013-2014 data collection, we have not made any changes to the industry questionnaire. We remind you to help us maintain the integrity of our database by using the current questionnaire available on our website, and not the version saved on your computer. (See II.A below)
  
  - In an effort to streamline submission of Process/Outcome Data, we also remind you to use the PO excel workbook, complete with codebooks, data entry shells, and a Research Cost Avoidance calculator. This will shorten the time it takes to enter, transmit and analyze your data. (See detailed description in Section II).
  
  - We know that some of you add your own questions to the Process/Outcome questionnaire. If so, please do not change the existing questions – we need all the useable data we can get!
  
  - We have made a few enhancements to the web-based LIFE forms (See details in Section II). We have done our best to make sure they are glitch free. However, if you encounter a problem, please let us know ASAP so that we may fix it.

- I.B. Reminders about Recent but Not Brand New Changes

  - NSF has requested that the members listed on your Evaluator Report Cover Sheets match the membership certification, otherwise the annual report will be rejected, so please be sure you get a copy of the membership certification before you complete the cover sheet.
  
  - You will keep receiving a reminder from us 60 days prior to your evaluator report due date that you should start collecting economic impact assessment data if applicable. Please read the guidelines below carefully and the detailed instructions contained on our website. Contact us if you have any questions (See II.B below).
  
  - When NSF cannot attend the IAB meeting, please remember to send to NSF a short meeting summary report using this form (See II.C below).
www.ncsu.edu/iucrc
New LIFE Features

Lindsey McGowen, PhD
NCSU I/UCRC Evaluation Project
January 8, 2015
## Overview

### Problem
- IAB are being asked to rate their level of interest in projects they have already approved
- New proposals are sometimes presented at the same meeting with project updates, confusion over which is which
- Evaluator would like to collect Faculty PO data at the meeting
- PIs losing their work when they respond to multiple IAB comments at once

### Solution
- Project phase specific response categories for new proposals vs project updates – optional
- Project phase labels – required
- Faculty PO survey link on PI response page – optional
- PI response option – now with one submit button per page; rating based navigation
New Meeting Options

- **Project Phase Ratings:** will provide project phase specific response options. For New Proposals, response categories reflect level of interest ratings.
  - Very Interested
  - Interested
  - Interested w/Change
  - Not Interested
  - Abstain

- For Project Updates, response categories reflect assessment of progress.
  - Great Progress
  - On Course
  - Needs Change
  - Off Course
  - Abstain

- **PI Faculty Survey:** allows you to select a version of the evaluator’s web-based faculty P/O questionnaire to be linked on the bottom of the project list presented to PI users.
New Project Phase Labeling

Use the drop down menu to select the appropriate project phase:
- New Proposal
- Project Update

The project phase label is required.

If you have selected the option to use project phase specific response categories, they will be based on the project phase you indicate here.
Meeting of January 5th, 2015

I. Index of Projects

[Add Project]
[PDF Paper Forms]

[Review Meeting]
[PDF Summary]
[MS Word File]
[Spreadsheet]

<table>
<thead>
<tr>
<th>Transport</th>
<th>Title</th>
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<th>University</th>
<th>Admin-Specified ID</th>
<th>Functions</th>
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<tbody>
<tr>
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<td>Dr. Who</td>
<td>My University</td>
<td>1.1</td>
<td>[Delete Project] [Edit] [Review]</td>
</tr>
<tr>
<td>Update</td>
<td>Sample Project</td>
<td>Dr. Jekyll</td>
<td>Your University</td>
<td>1.2</td>
<td>[Delete Project] [Edit] [Review]</td>
</tr>
</tbody>
</table>

Designated member representative **(one per member)** please complete the Industry Process/Outcome Questionnaire
Level of Interest and Feedback Evaluation (LIFE) Form

New Proposal

Project Name: (1.1) Example Project

Project PI: Dr. Who (My University)

To facilitate a dialogue between Center Faculty and Member Organizations, each industry representative is asked to indicate his/her organization's level of interest in each project. Unless the individual organizing LIFE feedback has instructed you otherwise, your identifying information will be handled as follows: it will not be shared during public IAB feedback sessions; it will be shared with center director and faculty in order to facilitate follow-up on specific suggestions.

Level of Interest

- Very Interested
- Interested
- Interested with Change
- Not Interested

Abstain (Outside my group’s ability to evaluate)

Comments? Please give your opinions about the progress since the last report, level of effort, offers to help and support, quality of research, scientific merit, suggested changes, pre-competitive applications, benefits to industry, and/or other comments here:

Note: This information will not be divulged during the review

Your Name: 
Your Organization: 

Submit Clear

Questions? Comments? email isrc@ucv.edu
Copyright IIL @ UCF

Note: This information will not be divulged during the review

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Your Organization: 

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Copyright IIL @ UCF

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Submit Clear
L.I.F.E. LEVEL OF INTEREST AND FEEDBACK EVALUATION FORMS

Meeting of January 5th, 2015

1. Index of Projects

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<td></td>
</tr>
<tr>
<td>Update Sample Project</td>
<td>Dr. Jekyll (Your University)</td>
<td>1.2</td>
<td>[Delete Project] [Edit] [Review]</td>
<td></td>
</tr>
</tbody>
</table>

Designated member representative (one per member) please complete the Industry Process/Outcome Questionnaire

Test 1/5/15 (Univ1) - January 5th, 2015

IAB Feedback

1. Index of Projects

[Back] [Review Meeting] [PDF Summary] [MS Word File]
Review Meeting with Project phase specific response categories

- Projects grouped by phase
- Click on any project title to see comments

- Reminder: Review meeting functions from the Admin side identifies the names of IAB respondents. Use the review meeting function from the User side to access summaries with anonymous IAB comments. PI responses are always identified by name.
Test 1/5/15 - January 5th, 2015

New Proposal

Project Name: (1.1) Example Project

Project PI: Dr. Who (My University)

Level of Interest

- Very Interested - 1
- Interested - 1
- Interested with Change - 0
- Not Interested - 0
- Abstain - 0

Very Interested

- How will you handle the fluctuation in temperature associated with your testing?

  Response 1: We have built a testing chamber to control all environmental variables

Interested

- I really like the inclusion of alloys as well as pure metals in the analyses.

Great progress

- Very impressed with the progress you've made on modeling the material properties.
  Response 1: thanks, we appreciate the help you gave us with acquiring the samples. -Dr. Jekyll

On course

- You are making good progress. I would like to see more focus on application to the aviation industry.
  Response 1: I'm sure we can accomplish that. -Dr. Jekyll
  Response 2: It would be great if you can share more detail about your application of interest. -Mr. Hyde

Needs change
Faculty PO Link

If you selected the option to include a link to the Faculty PO survey, it will appear after the project list on the PI page.

Reminder: If you are using the web-surveys, contact NCSU to get your data.
Tweak to PI response navigation

IAB comments on a project are grouped by rating, 5 comments per page. For example, this page displays the first 5 comments for “Great Progress”.

You can advance to the next set of comments by entering responses to the comments displayed and then clicking “Submit Response”, or by clicking on the response category for which you would like to see and respond to comments.

1. How will you address the perforation issue you’re having when you run the process?
   - Response: We have a plan to make the membrane stronger. Would be happy to discuss in detail.

2. Can you adjust the wattage required by the sensor? It seems like it requires a high power load.

3. Very intrigued by this project. Can you provide more detail about the component parts used to create the sensor?

4. Excellent work!
Questions?
IUCRC Logic Model Update
January 2015

Teri Behrens
Lindsey McGowen
Denis Gray
Analysis of Program Goals and Objectives

• Program has evolved over 30-plus years
• Goals and objectives have tended to be emergent and/or high-level impacts
• Evaluation has also been ongoing and emergent
• Program solicitation emphasizes “means” and “ends” with little in between
• Little guidance on the mechanism(s) that help translate means into ends
• Little guidance on all the intermediate steps that come between means and ends
NSF 13-594
Means and Ends

Means

• Leverage NSF funds with industry to support graduate students performing industrially relevant research;
• Integrate research and education, and facilitate technology transfer
• Promote research programs of mutual interest
• Active engagement with academic and industrial leaders throughout the world
• Develop long term partnerships among industry, academe and government

Ends

• Contribute to the nation's research infrastructure base
• Enhance the intellectual capacity of the engineering or science workforce
• Expanding the innovation capacity of our nation's competitive workforce
• Encouraging the nation's research enterprise to remain competitive

Enhanced Innovation Ecosystem
Project Goals

• Shine a light on ...
  • Program Mechanism(s)
  • Program Logic Model: activities, outputs, outcomes, impacts for various stakeholder groups and indicators for each
  • Identify data that has been collected to support program effectiveness and identify opportunities for additional assessment
Project Team

- Teri Behrens
- Alexandra Medina-Borja
- Craig Boardman
- Connie Chang
- Denis Gray
- Shannon Griswold
- Larry A Hornak
- Lindsey McGowen
- Craig Scott
- Eric Sundstrom
  - With additional feedback from the Evaluator Group
Process

• In-person workshop – generated many ideas
• Drafted LM
• Reviewed over 4 conference calls
• Presented to Evaluator Group in June 2014
• Feedback incorporated
• Revised (Final?) LM review in January 2015
• Logic modeling is an iterative process – should be a living document
IUCRCs: BUILDING AN ENHANCED RESEARCH AND INNOVATION ECOSYSTEM

IUCRCs are a SYSTEM level intervention – targeted support creates a self-reinforcing network of relationships.
Center Operations

**Inputs**
- University resources and facilities
- NSF Funding, Prestige and Technical assistance
- Industry intellectual and financial support

**Activities**
- Manage center according to best practices
- Conduct industry-relevant research
- Partnering / boundary spanning

**Outputs**
- Immediate results of activities – first year
- Short-term Outcomes (What is different after 1-2 years?)
- Short-term Outcomes (What is different after 1-2 years?)
- Intermediate - Long-term Outcomes (3 – 10 years)

**Impacts / Externalities**
- NSF On-going Technical Assistance
- Center Growth: Award of supplemental funds / contracts -- New members added -- New research sites added

**Center Operations**
- Leadership
- Research results
- Human capital - Faculty and students with skills relevant to industry
- Social capital – trust among university and industry

**Faculty**
- Increased:
  - Scholarly productivity & reputation
  - Advances in knowledge
  - Skills in collaborative research
  - Consulting / contract opportunities
  - Ability to attract / support students
  - Understanding of industry needs and opportunities
  - Industry network

**Center / University**
- Self-sustained partnership with industry
- Increased ability to attract faculty, students, and external research support
- Deeper and increased interactions with industry
- Enhanced reputation
- More entrepreneurial culture

**Student**
- Increased opportunities for internships/employment
- Research achievements
- Ideas / funding for thesis / dissertation research
- Industry network

**Industry**
- Access to potential employees
- Amplified R&D
- Broader scientific network
- Access to IP

**Enhanced research and innovation ecosystem**
- Enhanced research and innovation ecosystem
## Inputs
- Human resources (faculty, researchers, students)
- Equip. & facilities
- Research accomplishments
- Financial support (reduced indirect, support for admin and student)
- Social capital (existing collaborations, networks)
- Organizational capital (policies, mission, culture)

## NSF
- Funding & prestige
- Evaluation
- Best practices and technical assistance
- Program requirements
- Organizational capital

## University
- Human resources (faculty, researchers, students)
- Equip. & facilities
- Research accomplishments
- Financial support (reduced indirect, support for admin and student)
- Social capital (existing collaborations, networks)
- Organizational capital (policies, mission, culture)

## Industry
- Financial support
- Technical insight and direction
- Research accomplishments
- Specialized equipment and materials
- Time
- Human capital
- Social capital

## NSF On-going TA

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## Center

### Center Structure
- Center Growth & Recruitment
- Award of supplemental funds / contracts
- New members added
- New research sites added

### Center / Dept. / University
- Self-sustained partnership with industry
  - Increased ability to attract faculty, students, and external research support
  - Deeper and increased interactions with industry
  - Enhanced reputation
  - More entrepreneurial culture
- Funding from diversified sources
- New / enhanced relationships with industry
- Opportunities for scientific leadership

### Students [Alumni]
- Increased opportunities for internships/employment
- Research achievements
- Industry network (social capital)

### Industry
- Access to potential employees
- Amplified & efficient R&D
- Broader scientific network
- Access to IP

### Facult y
- Increased: Scholarly productivity & reputation
  - Advances in knowledge
  - Skills in collaborative research
  - Consulting / contract opportunities
  - Ability to attract / support students
  - Understanding of industry needs and opportunities
  - Industry network

### Students [Alumni]
- Skills in bridging between university and industry contexts

### Industry
- More efficient research
- Better prepared employees
- Ability to capitalize on university research
- New / improved products, processes, know-how and/or services
- Broader scientific network

### Enhanced research and innovation ecosystem
- Strengthened connections and feedback among parts of the system
- Enhanced economic competitiveness
- Expanded innovation capacity
- Increased / enhanced scientific and technical human and social capital

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## Activities

### Center Management
- Lead and Manage center
  - Leadership
    - Implement center model (best practices)
    - Recruit members
    - Coordinate research agenda
    - Evaluate
    - Plan and select research

### Conduct industry-relevant research
- Collaborate with other researchers (industry and university)
- Teams execute research activities
- Manage projects to meet industry standards

### Partnering / boundary spanning
- Champion center research internally
- Interact with / among members
- Share knowledge and ideas
- Participate in center meetings

### Research results
- Reports, publications, presentations
- Intellectual property

### Human capital
- Faculty and students with skills relevant to industry
- Graduates
- Industry members with deeper understanding of university resources, skills, talent
- Research management skills (director)

### Social capital
- Increased trust among and between university and industry members

### Center Outputs
- Reports, publications, presentations
- Intellectual property

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## Short-term Outcomes
(What is different after 1-2 years?)

### Faculty Increased:
- Scholarly productivity & reputation
  - Advances in knowledge
  - Skills in collaborative research
  - Consulting / contract opportunities
  - Ability to attract / support students
  - Understanding of industry needs and opportunities
  - Industry network

### Students [Alumni]
- Increased opportunities for internships/employment
- Research achievements
- Industry network (social capital)

### Industry
- Access to potential employees
- Amplified & efficient R&D
- Broader scientific network
- Access to IP

---

## Impacts / Externalities

**Key:**
- Red text – no research to date
- Underline – previous research may need to be updated
- Black text – sufficient current research
Next Steps

• Feedback from team and NSF
• Build link between measurement LM and data source
• Identify and fill gaps in evaluation / research