### Project Participants

#### Senior Personnel

<table>
<thead>
<tr>
<th>Name</th>
<th>Worked for more than 160 Hours</th>
<th>Contribution to Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trochim, William</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Earle, Jane</td>
<td>Yes</td>
<td>Jane is the lead evaluation facilitator for our MRSEC partnerships. She is .5 FTE on this project. She participates in training material development, measurement development and data collection, and contributes in all project goals. She sets meeting dates and agenda, teaches evaluation to MRSEC partners, responds to their questions and provides support to them. Jane also contributes to our theory development, program modeling, and writing.</td>
</tr>
<tr>
<td>Hebbard, Claire</td>
<td>Yes</td>
<td>Claire is .5 FTE on this project. She is the project manager and provides oversight on research activities, with a focus on addressing the evaluation questions as outlined in the research proposal. She schedules team meetings, conducts administrative tasks associated with the project, assists in material development and measure development, tracks data, and writes reports. Claire took a leadership position on bringing the Protocol to publication.</td>
</tr>
<tr>
<td>Hargraves, Monica</td>
<td>Yes</td>
<td>Dr. Hargraves is the Manager of Evaluation for Extension and Outreach. Her position is supported by Cornell University and CCE, but the majority of her work contributes to this project. Monica develops and edits training materials and measures, and serves as the evaluation facilitator for the CCE cohort. As such she communicates with them and organizes and schedules meetings and workshops. She also collaborates on developing and administering our measures, and assists in data analysis and interpretation, theory development, and program modelling.</td>
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</table>

#### Graduate Student

<table>
<thead>
<tr>
<th>Name</th>
<th>Worked for more than 160 Hours</th>
<th>Contribution to Project</th>
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</thead>
<tbody>
<tr>
<td>Archibald, Tom</td>
<td>Yes</td>
<td>Tom in a graduate student in Education. He participates on the research team by assisting in developing teaching materials and measures; administering measures and collecting data, conducting data analysis, participating in trainings and teleconferences, providing direct assistance to Evaluation Facilitator of the MRSEC cohort. He works collaboratively with all team members and partners. Tom has also presented the project at professional conferences, and has sought out workshops and training opportunities related to his work here.</td>
</tr>
<tr>
<td>Johnson, Margaret</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Worked for more than 160 Hours: Yes

Contribution to Project:
Margaret is a Graduate Research Assistant financially supported by the College of Human Ecology at Cornell. She participates on the research team by assisting in developing teaching materials and measures; administering measures and collecting data, conducting data analysis, participating in trainings and teleconferences, providing direct assistance to Evaluation Facilitator of the CCE cohort. She works collaboratively with all team members and partners and has sought out workshops and training opportunities related to her work here.

Undergraduate Student

Name: Dang, Haixin

Worked for more than 160 Hours: Yes

Contribution to Project:
Haixin worked with us on the pilot project, and continues with us. She has conducted literature reviews and provided direct assistance in writing/drafting an article. She has participated in trainings and teleconferences, and more recently has worked with the research team in developing logic and pathway models, theory development, and data analysis.

Name: Eilbaum, Stacey

Worked for more than 160 Hours: Yes

Contribution to Project:
Stacey worked with us on the pilot project, and continues with us. She has conducted literature reviews and provided direct assistance in writing/drafting an article. She has participated in trainings and teleconferences, and more recently has worked with the research team in developing logic and pathway models, theory development, and data analysis.

Name: Monahan, Nicole

Worked for more than 160 Hours: Yes

Contribution to Project:
Nicole has conducted literature reviews on several concepts we are thinking about, including the reflective practitioner and diagramming systems and models. She has also worked on developing and editing training materials/tutorials, participated in trainings and conference calls, and provided general project clerical support.

Name: Hatcher-Mullins, Joshua

Worked for more than 160 Hours: Yes

Contribution to Project:
Joshua provided general project support through data entry and conducting QA on the Netway. He also participated in trainings and conference calls, assisted in workshop material preparation, and began work on creating video clips for training. He also printed out posters of program pathway models, and developed an instruction sheet to assist others in creating posters.

Technician, Programmer

Other Participant

Name: Cooksey, Leslie

Worked for more than 160 Hours: No

Contribution to Project:
Dr. Cooksey is the chair of our External Advisory Board. The board was introduced to the project and provided comments and suggestions via a teleconference. The annual in-person meeting is scheduled for August, whereupon the Chair will finalize their comments and recommendations in writing.

Name: Mark, Mel

Worked for more than 160 Hours: No

Contribution to Project:
Board members meet three times a year. They review the activities of our project and provide input regarding the successes, challenges, and future direction of the project.

Name: Greene, Jennifer
Worked for more than 160 Hours: No
Contribution to Project:
Board members meet three times a year. They review the activities of our project and provide input regarding the successes, challenges, and future direction of the project.

Name: Hopson, Rodney
Worked for more than 160 Hours: No
Contribution to Project:
Board members meet three times a year. They review the activities of our project and provide input regarding the successes, challenges, and future direction of the project.

Name: Rog, Debra
Worked for more than 160 Hours: No
Contribution to Project:
Board members meet three times a year. They review the activities of our project and provide input regarding the successes, challenges, and future direction of the project.

Name: Urban, Jennifer
Worked for more than 160 Hours: No
Contribution to Project:
Dr. Urban is the Co-PI (we can't find any other place to enter her). Her involvement has been limited in Year 1, but will increase substantially in Year 2.

Dr. Urban has participated in conversations about the direction of the Virtual SEP, and has been kept updated on all project activities. She attended the National conference for the American Evaluation Association and presented our work on the cyberinfrastructure part of the project. She participates in Board conference calls and meetings.

Research Experience for Undergraduates

Organizational Partners

Cornell Center for Materials Research
One of our .5 FTE key staff (Jane Earle) is an employee at CCMR. She uses their office space, telephone and computer for her work with this project. Also, we maintain communication with CCMR leadership as we continue to discuss potential future collaborations.

Cornell Cooperative Extension
Many of our participants are CCE programs. Additionally, Cornell University Cooperative Extension funds the full-time position of the Manager of Evaluation for Extension and Outreach, and this person (Monica Hargraves, who is listed as working on the project) serves as the evaluation facilitator for the CCE cohort of this project. CCE and state 4-H leadership consults with us for selecting Science, Engineering and Technology (SET) programs to participate in our research. And the CCE system, as a whole, benefits from the training their staff receive during our project.

Cornell University, College of Human Eco
The College of Human Ecology at Cornell University sponsors a graduate research assistant (Margaret Johnson) who has participated this first year of the project.

Other Collaborators or Contacts
Through CCMR we have connected with the national MRSEC group. Three individual MRSECs are currently participating in our research, while also using our materials to improve their programming. Participating MRSECs include Yale CRISP, University of Chicago MRSEC, and University of Maryland MRSEC.
Similar to these three MRSEC programs, there are 19 CCE program that also are working on this project. This includes the leadership and 4-H program staff from the following counties (or region) in New York State: Chemung, Chenango, Clinton, Cortland, Franklin, Fulton, Genesee, Jefferson, Lake Plains (Monroe and Wayne counties combined), Madison, Oneida, Ontario, Oswego, Rensselaer, Saratoga, Seneca, Tioga, Tompkins, and Ulster.

Future collaborations are likely to increase because there has been a wide-spread interest in the project. The MRSECs are showing a greater interest in getting involved than has been supported through our current funding, and interest has also extended to the NSECs (Nanoscale Science and Engineerin Centers). The PI on this project has been invited to present a half-day workshop about our methodology at the MRS Fall Meeting in Boston.

The national Children, Youth and Families at Risk (CYFAR) programs, as well as the NY CYFAR program individually, have expressed interest in our resources, and possibly participating in the research.

Activities and Findings

Research and Education Activities:
This project constitutes one phase of a four-phase model for developing and testing effectiveness of the Systems Evaluation Protocol (SEP) in evaluating STEM outreach programs. This study is a Phase II trial. As such it is not meant to be a causal assessment of the effects of SEP; it is meant to assess whether the SEP program, when implemented in several different common STEM contexts, is associated with change in program evaluation capacity and quality when evaluating short and intermediate outcomes.

There are three distinct research subprojects to be conducted throughout the 5-year research plan. These include 1) the phase II study of the facilitated SEP to assess if it is associated with change in program evaluation capacity; 2) the development of a virtual SEP and comparison of this method to the facilitated method; and 3) the continued development and testing of the Netway - an evaluation cyberinfrastructure that facilitates networking, program modeling, and evaluation planning.

There are two non-research components of this project, 1) an External Advisory Board, and 2) sponsoring and hosting a Graduate Diversity Intern with the American Evaluation Association.

This report is for Year 1 (August 2008 - July 2009).

Major research activities and education activities (experiments, observations, presentations)

The focus of Year 1 has been to begin work on the grant project by bringing on a new cohort of Evaluation Partnerships. This cohort is referred to as the Early Adopters in the project proposal. The plan had been to bring on 3 Science, Engineering and Technology programs from Cornell Cooperative Extension (CCE-SET), and 3 STEM programs from national MRSEC programs in Year 1. Due to the strong interest in this project we actually brought on 19 CCE-SET programs and 3 MRSEC-STEM programs, for a total of 22 new programs. Therefore we have 22 complete MOUs, one with each program, that outline expectations and responsibilities for all cohort members for Year 1 of the project. Each MOU represents what we will refer to as an Evaluation Partnership (EP).

The CCE-SET and the MRSEC-STEM are referred to by us as being two different systems. In total for these Early Adopters, there are currently 61 participants getting training in the CCE-SET system, and 4 participants being trained in the MRSEC-STEM system. Each system had a different CORE staff person coordinating their communications and conducting their training. The CCE-SET system was facilitated by the CCE funded Manager of Evaluation for Extension and Outreach, Monica Hargraves. Dr. Hargraves was one of the CCE Evaluation Project Managers (EPMs) from the Pilot NSF project. The MRSEC-STEM system was facilitated by the .5 FTE research assistant funded through this grant - Jane Earle. Ms. Earle was one of the EPMs from the Cornell Center for Materials Research (CCMR) also from the Pilot NSF project.

Materials and workshops for each group were tailored to each specific audience, but efforts were expended to assure communication between the CCE-SET and MRSEC-STEM evaluation facilitators who worked together to develop similar materials and present the same steps as outlined in the Systems Evaluation Protocol that was developed in the Pilot project.
The first 3-5 months of this project were spent on Protocol steps 1.01-1.05, including several internal meetings, several meetings with CCE leadership, and several phone calls with different MRSEC offices, in order to set up the Evaluation Partnerships for Year 1 of this project. Baseline data was collected.

For both groups, the trainings have been presented through a combination of in-person meetings and web conferences. The CCE-SET groups first met in February and March for face-to-face one-day regional workshops (4 in all) to begin work on the project (Protocol steps 1.06, 2.01-2.05). In April we held two optional Q&A web conferences and a mandatory Logic Model web conference (Protocol steps 2.06 & 2.07). During May there were 3 optional web conferences for the programs to get help on their modeling, in preparation for the second face-to-face meeting in June (each program attended one of the two workshops offered). During the June meeting the programs worked on Protocol steps 2.07-2.10, and began 3.01. Two July web conferences were held for developing evaluation questions (Protocol step 3.02).

The MRSEC-STEM groups had their first web conference in December (Protocol step 1.06), followed by the second one in early February (Protocol steps 2.01-2.06), and then a day-long face-to-face meeting in Ithaca in March (Protocol steps 2.06 & 2.07). During these months the evaluation facilitator conducted 3-4 teleconferences individually with each program team in order to develop their models. This was followed by the busy time of year for MRSEC reporting, so the next teleconference wasn't held (by their request) until mid June, when they worked on Protocol steps 2.07-2.10.

From August through January considerable time was spent in editing the written protocol which was published in May. The protocol is 45 pages, but the printed book also contains 66 pages of measures and training materials that were used in the Pilot study. These measures and training materials were edited and built upon, and the new materials will provide a framework for the development of the Virtual SEP in Year 2 of this project. In year 1 we have edited or created the following:

Training Presentations: Launch presentation; Evaluation Partnership History and overview; Launch goals; Stakeholder Analysis and Information Flows; Program Review and Boundary Analysis; Brief Introduction to Program Lifecycles; Introduction to Logic Models; Introduction to the Netway; Introduction to Pathway Models; Celebrating Progress; Capturing Program Context; Uncovering Buried Assumptions; Introduction to Evaluation Scope, Lifecycles and Evaluation Planning; Evaluation Scope and Evaluation Questions; Introduction to Measurement.

Resources: Netway Training Checklist; Welcome to the Netway (Program Manager Tutorial); Background Information on the Netway (history); Creating a Logic Model on the Netway (tutorial); Getting Started with Logic Models, Creating a Pathway Model on the Netway (tutorial); Tips for Evaluation Plans; How to Export a Pathway Diagram from the Netway (tutorial); How to Link Outcomes to Measures (tutorial); Checklist for Program Descriptions, Measures Manual.

Worksheets: Stakeholder Worksheet and Map; Program Review Worksheet; Program Boundary Worksheet; Logic Model Template and Guidance; Reviewing Models (sticker activity #1); Mining the Model (sticker activity #2); Evaluation Scope (sticker activity #3); Capturing Program Context worksheet; Evaluation Purpose Statement worksheet, Evaluation Questions and Program Lifecycle Template, Evaluation Questions worksheet, Getting to Measures worksheet.

Measures: Our measures for this Y1 Early Adopter cohort include:
Organization Capacity Survey
Program Evaluation Capacity Survey
Attitude Survey
Logic Model/Pathway Model Rubric
Prior/Current evaluation activity survey
Aha's and Challenges
Year-end progress reports (pilots only)

Baseline data for the first six measures was collected on all 22 programs. In addition, by October it is our intention to conduct the phone survey created and used for the Pilot project.

Netway

Early in 2009 we released a new version of the cyberinfrastructure - The Netway. This included enhancing the ability to enter and link outcomes to measures. A Cornell senior majoring in Human-Computer interaction worked with us to develop a user-friendly interface, the results of which will be integrated into future Netway updates. The PI has also been working with Cornell Center for Technology Enterprise and Commercialization (CCTEC) to initiate discussions of how to transfer the technology created in the Netway to a commercial business.
Requests for access to the Netway have been numerous, and it is beyond the scope of this research to support a larger user base.

External Advisory Board

The Fall of 2008 was used to recruit professionals from the field of evaluation to participate for the 5-year term of the grant on an advisory board. Individuals were invited based upon their status in the American Evaluation Association (3 past presidents and the current president elect), their interest in both evaluation research and STEM programming, and their experience and interest in diversity issues in evaluation.

Dr. Leslie Cooksy is serving as the EAB chair, and is the 2010 AEA President. She is an Associate Professor at the University of Delaware where she creates and coordinates an interdisciplinary graduate program in evaluation and teaches in Research Methodology and Evaluation doctoral specialization. Dr. Cooksy also is the lead for evaluation projects in the Delaware Education Research & Development Center.

Dr. Melvin Mark is Professor of Psychology at Pennsylvania State University, and is a Past President of the AEA. His interests include the appropriate use of social science research in social policy, particularly in the context of program evaluation. He was the PI for two NSF awards #0451261 and #0231859.

Dr. Jennifer Greene is Professor at the University of Illinois and teaches Quantitative & Evaluative Research Methodologies, as well as Educational Psychology. She works in the domain of educational and social program evaluation, and seeks to advance the theory and practice of alternative forms of evaluation, including qualitative, democratic, and mixed methods evaluation approaches. She is the Principal Investigator for NSF Award #0535793, 'Advancing the State-of-the-Art in Evaluation: Field-Testing and Disseminating an Educative, Values-Engaged Approach to Evaluating STEM Education Programs', which stemmed from her previous NSF Award #0334621.

Dr. Rodney Hopson is Professor in the Department of Foundations and Leadership at Duquesne University, where he teaches several courses on Research Methods, Program Evaluation, Foundations of Education and Education Language, and specific interest in Ethnographic Evaluation. He is the PI on three NSF Awards (#0742033, #0634083 and #0548386), two of which were STEM related.

Dr. Debra Rog is an Associate Director at Westat, an employee-owned corporation providing research services to agencies of the U.S. Government, as well as businesses, foundations, and state and local governments. Dr. Rog is the current AEA President.

The Board met via tweb conference for 2 hours in February in order to get acquainted with the project. The annual face-to-face meeting is scheduled for August 14. Their report will be submitted at a later date.

Internship

The internship sponsored by this grant for this first year was filled by Wanda Casillas, a graduate student at Cornell in Developmental Psychology. The purpose of this internship is to recruit graduate students of color and other underrepresented groups to extend their research capacities to evaluation; stimulate evaluation thinking concerning underrepresented communities by providing professional development training opportunities for graduate students of color and other underrepresented groups; and deepen the evaluation profession's capacity to work in racially, ethnically and culturally diverse settings. Ms. Casillas attended classes held at Dusquesne for all the AEA diversity interns nationally. She also attended the annual meeting of the American Evaluation Association in November 2008, and has begun her research in understanding cultural competency within STEM programs. Ms. Casillas is conducting a concept mapping study, a methodology developed by Dr. Trochim, and will begin to get at defining cultural competency as it relates to outreach programs and program evaluation.

Findings: (See PDF version submitted by PI at the end of the report)

Although this project has not yet concluded its first year of the process, there are several themes to report on.

Our project is focused on building evaluation capacity. As we have worked to develop our measures of both a program's evaluation capacity and an organization's evaluation capacity we have come across multiple definitions of evaluation capacity and evaluation capacity building. We have at least 4 different definitions of evaluation capacity building:


GAO identifies 4 key elements of Evaluation Capacity Building (1) evaluation culture (2) collaborative partnerships (3) data quality and (4) analytic expertise (GAO. (2003, May). Program Evaluation: An Evaluation Culture and Collaborative Partnerships Help Build Agency Capacity.)

We can identify 5 components of capacity building: Human Resources; Infrastructure; Policy; Capital; and Management Support. We have been examining our Organization Capacity Survey and Program Capacity Survey for their appropriateness for measuring these concepts. At this point we are seeing increases over time (beginning with our pilot studies) but it is yet not clear whether these changes reflect actual changes in capacity, or perhaps only reflect increased awareness of resources and policies.

In this project we are working with two groups of STEM-related outreach programs to develop their evaluation plans. There are 19 Cornell Cooperative Extension Science, Engineering and Technology Programs (CCE-SET) programs and three Materials Research Science Education Center STEM (MRSEC-STEM) programs. Although the topics of these programs are similar, the nature of the organizations are very different. Therefore, we categorize these program groups as separate 'systems.' The CCE-SET system is represented in the graphs attached in red, and the MRSEC-STEM system is represented in blue.

The graphs are based on data taken from the cyberinfrastructure (the Netway.) The Netway maintains a log that creates a record (including date, time, and user name) for a set of designated user actions. These records are created for example when a user signs in to the system, conducts a search, creates a report, works on their program information (including program description, logic model, pathway model, evaluation plan), views another program's information, conducts administrative functions, or signs out of the Netway.

It is important to note that although all programs are currently at approximately the same step in the training (they are developing evaluation questions) they began the training process at different times. The graphs adjust for this, in that the data cover Netway activity beginning as of the Launch meeting for each system (12/9/08 for the MRSEC-STEM programs, and 2/27/09 for the CCE-SET programs.)

Figure 1 shows the total number of log records in each program since they began their evaluation planning work at their Launch meetings. There is a fair amount of variation across programs in both systems.

The average across programs within each system (Figure 2) is noticeably different. We will need to explore further, including looking into frequency distributions across the types of log events, in order to hypothesize about this difference in averages between the two systems.

As explained above, the calendar interval beneath each system's log is different because of the timing of their actual Launch meetings. That is, the MRSEC data cover 235 days of possible Netway activity, the CCE-SET data cover 153 days. Using this information we determined the average number of log records per day for each program. This is displayed in Figure 3 and again we see considerable variability. The average of these per-program averages is displayed for each system in Figure 4. Give the different time spans in each case, for the same set of work steps, the MRSEC average is likely to be lower for that reason alone. As noted above, we need to do further work in order to begin to determine whether the difference in averages is informative in any way about differences in practices and work habits or other factors. Also, relating available data to the quality of the logic models, pathway models and evaluation plans may stimulate some important conversations.

We have just begun to look at what kind of information we can collect using our log data. It is too early and our samples are too small to draw any hard conclusions. Currently we use this type of information to monitor each program's use of the cyberinfrastructure as they progress. Over time we will be taking a closer look at differences between programs and systems, and break the log data apart into different activities so we can see where users spend the most time. This data will also allow us to examine how use of the cyberinfrastructure varies over time in comparison to training dates and project due dates.

A final thought for now, expressed as a serious concern by many of our participants is the time requirement for conducting evaluation. Participant engagement seems high during our workshops, and feedback on trainings is generally very positive, but many of the programs are having difficulty meeting monthly deadlines. It may be that the best way to increase evaluation capacity and evaluation, in general, is to build it into their every-day activities so that it is integrated into their program and not just another task to add to their already full agendas.
We are beginning to consider the differences, if any, between the CCE programs and the MRSEC programs. The MRSEC organizations we are working with on average has 2.5 FTE, whereas the CCE organizations are much larger, averaging 24.3 FTE. The MRSECs are reporting spending more time per week on average in evaluation than the CCE offices (4.5 vs. 2.5 hours a week, but this is based on self-report.

For our work, an issue of concern at this time is about deciding how to try to adequately provide a virtual method of disseminating this protocol methodology.

**Training and Development:**

The evaluation facilitators on this project have greatly increased their understanding of evaluation and their understanding of teaching evaluation to adult learners. They have also gained experience working with web-conferencing resources ? including desktop sharing, presentations, and collaborative editing.

Graduate students working on this project have been deeply engaged in developing measures and conducting the research. They have had opportunities for teaching and public presentations (including being adept at PowerPoint), group collaborations, independent research, data tracking, and mentoring of undergraduate students. This research has provided the focus for completion of a Master's thesis work for one graduate student, and our participants will be invited to join the Cultural Competency study by the Diversity intern for her Master's work next year.

Undergraduates working on this project are more confident in their abilities to pursue a graduate degree which includes research responsibilities. They have conducted independent research and presented it to the group, collaborated on writing reports and professional publications, and have worked with graduate students to create a logic model and pathway model for the research project. They also attended and participated in the face-to-face meetings with the Evaluation Partnerships. They gained experience in several software programs ? Word, Access, Powerpoint, Endnote, Illustrator ? and the Netway cyberinfrastructure, and in printing posters.

**Outreach Activities:**

In November 2008 we presented certain aspects of our work ? the cyberinfrastructure ? at the National Conference of the American Evaluation Association. The audience consisted of professionals interested in evaluation. We have applied, and been accepted, to present an overview of the Systems Evaluation Protocol, our theory of program and evaluation lifecycles, and a portfolio of evaluation plans developed by the CCE-SET programs at the November 2009 conference.

We have taken advantage of several opportunities to talk about evaluation of outreach programs with several audiences ? both within New York State with 4-H program leaders who were not in our current cohort, and nationally with Children, Youth and Families at Risk (CYFAR) leadership. These include presenting at a statewide meeting of Executive Directors of CCE Association in Dec 2008, and the Youth Development Program Council consisting of faculty and Extension staff across New York State in March 2009.

In June 2009 we released our website at http://www.core.human.cornell.edu.

**Journal Publications**


**Books or Other One-time Publications**

Editor(s): none
Collection: none
Bibliography: Ithaca, NY. Cornell Digital Print Services

**Web/Internet Site**
URL(s):
http://www.core.human.cornell.edu

Description:
Website discussing research and disseminating research results

### Other Specific Products

**Product Type:** Software (or netware)
**Product Description:**
Version VI of the Netway - the cyberinfrastructure for evaluation planning

**Sharing Information:**
This website and database - http://extensionnetway.net/ - is the cyberinfrastructure that is utilized by our evaluation partnership cohorts and their colleagues. It is a password-protected resource so that most of the people using it are using the Systems Evaluation Protocol.

**Product Type:** Teaching aids
**Product Description:**
We have developed measures and training materials associated with this project, and these are mentioned in the activities section but are also listed here. In addition to helping us to conduct our research these materials can be useful beyond our research.

**Sharing Information:**
These materials in their most current format will be made available in our next version of the printed protocol, and at that time will also be made available in the web.

### Contributions

**Contributions within Discipline:**
The newly printed 'Facilitator's Guide to Systems Evaluation Protocol' has been a significant contribution to the field of evaluation. Based upon a general Protocol outline developed during the pilot project, the printed Protocol includes the history of the project, an introduction to our concept of 'systems evaluation', and expanded text and discussion for each step of the Protocol. We are using this publication with our current cohort, but also make it available both online (http://www.core.human.cornell.edu/research/systems/protocol/seppdf.cfm) and as a hard copy upon request.

This grant contributed to our general understanding of evaluation policy and its importance to evaluation practice and program improvement and development. That in turn influenced the PI's presidential address to the American Evaluation Association in November 2008, and the subsequent New Directions in Evaluation volume that is currently in press and is expected to have a major impact on the field.

Also based upon this project we have been invited to write a chapter for the next edition (2010) of the Handbook of Practical Program Evaluation. Examples of our methodology work will be utilized.

The PI of this project had directly talked with Nev Singhota (CCMR) in her role as committee chair for STEM Evaluation. Through this work the MRSECs nationally have been more involved in evaluation of their education programs, and are working with the Nano-science centers to present a half-day workshop at the Fall MRS meeting in November 2009.

**Contributions to Other Disciplines:**
The work of the cohorts in this project has improved their understanding of their program, as well as their ability to communicate with their stakeholders about their goals and impacts. Additionally, these programs have a better understanding of evaluation, and are better equipped to conduct good evaluation of their programs.

As we have worked with programs to develop their evaluation plans the organization leadership has frequently followed the progress. In many cases the leadership is seeing the cyberinfrastructure as a tool to help them in program planning and development.

**Contributions to Human Resource Development:**
Opportunities for college students to work on this project have resulted in mentoring from CORE staff of several graduate and undergraduate students. Undergraduates particularly express an increased interest in pursuing scientific research as a career. They report that they have increased their communication with their science peers about science education and evaluation.

We are educating a new generation of practitioner-evaluators both in the NSF MRSECs and in CCE. In turn, these practitioners are spreading their knowledge to their peers, greatly enhancing the evaluation capacity of their organizations and of the STEM Outreach field as a whole.

**Contributions to Resources for Research and Education:**

The Netway cyberinfrastructure is increasingly becoming a better resource for educators. In the most recent version released in February 2009 the ability for Netway participants to communicate with each other has been improved. There is room for citation information for evaluation measures to be put in the Netway, and users are able to associate a measure to their specific outcome. In addition, users can recommend a measure to another program with similar outcomes.

Our Protocol is available to evaluators both as a hard copy and electronically through our website (http://www.core.human.cornell.edu/research/systems/protocol/seppdf.cfm). This resource may also be used by program leaders interested in integrating a systems approach to their evaluations. In addition to being a step-by-step protocol for conducting evaluation, it also contains a chapter on Systems Evaluation Theory and can help evaluators to consider new perspectives as they approach their evaluations.

The measures that we are developing are available to other evaluators who are looking to assess similar concepts to ours, including: Attitude towards Evaluation, Organization Evaluation Capacity, Program Evaluation Capacity, Logic Model and Pathway Model Quality, and Quality of Evaluation Plans. Our literature reviews did not uncover previous measures that we believe more adequately address these concepts.

**Contributions Beyond Science and Engineering:**

Our research is contributing to the field of evaluation broadly by helping to shape the next generation of resources and processes that will be informed by the latest in systems thinking and approaches. We are contributing to the way the US federal government (and other entities) is approaching evaluation, primarily through our emphasis on evaluation policy (supported in part through this grant), but also through education on the idea of evolution of both programs and program evaluation. Traditionally government agencies are inclined to rigidly request and expect what they are viewing as the 'gold standard' method of evaluation - the Randomized Controlled Trial (RCT). Understanding and using the SEP shows how RCT's for newer programs that are still in development may not be the most efficient use of resources, and don't provide the evaluation data and rapid feedback required by these early-lifecycle programs.

The Systems Evaluation Protocol and cyberinfrastructure will be valuable to any field that engages in evaluation.

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**Conference Proceedings**

**Special Requirements**

**Special reporting requirements:** None

**Change in Objectives or Scope:** None

**Animal, Human Subjects, Biohazards:** None

**Categories for which nothing is reported:**

Any Conference
In this project we are working with several STEM related outreach programs to develop their evaluation plan. There are 19 Cornell Cooperative Extension Science, Engineering and Technology Programs (CCE-SET) programs and three Materials Research Science Education Center STEM (MRSEC-STEM) programs. Although the topics of these programs are similar, the nature of the organizations are very different. Therefore, we categorize these programs as separate “systems”. The CCE-SET system is represented by the color red, and the MRSEC-STEM system is represented by the color blue.

The following graphs are based on log data taken from the cyberinfrastructure. All programs are approximately at the same place in their training – and are developing evaluation questions, but they began training on different days.

Figure 1 shows the current number of logs per program since they began their evaluation planning work. The logs currently track the date and time when a user logs on, conducts a search, creates a report, works on their logic model or pathway model, views another program’s information, conducts administrative functions, or logs off of the Netway (note that some users simply close their browser window, so not every user will officially log off).

Looking at each system separately we can see that, to date, the MRSEC-STEM system has a higher utilization rate on the cyberinfrastructure (Figure 2). However, The MRSEC-STEM system began their evaluation planning work in early December 2009, whereas the CCE-SET system was not launched into their work until late February, 2009. Figure three shows the total number of days each system has had access to the cyberinfrastructure, and using this we were able to determine the average number of logs per day for each system (Figure 4). Finally, we looked for differences in average daily use of the cyber infrastructure per program (Figure 5).

We have just begun to look at what kind of information we can collect using our log data. It is too early, and our samples are too small to draw any hard conclusions. Currently we use this type of information to monitor each program’s use of the cyberinfrastructure as they progress. Over time we will be taking a closer look at differences between programs and systems, and break the log data apart into different activities so we can see where users spend the most time. This data will also allow us to examine how use of the cyberinfrastructure varies over time in comparison to training dates and project due dates.
Figure 1

Figure 2
Figure 5