AAAS Review of the Rhode Island National Science Foundation
Experimental Program to Stimulate Competitive Research

Review June 5-8, 2012
Final Report Submitted August 2012

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Executive Summary

The Rhode Island NSF EPSCoR has successfully built a statewide consortium representing a diverse range of higher education institutions with respect to mission, student enrollment, concentration and expertise, and research capacity. Building a statewide network of this size and complexity is challenging and is a significant accomplishment for Rhode Island given that the network did not exist prior to the start of NSF EPSCoR.

Among the Primarily Undergraduate Institution (PUI) campuses that the AAAS panel visited this year, the panel observed a healthy number of recently renovated laboratory spaces, the acquisition of new equipment, and faculty hires with research areas directly tied to the Rhode Island NSF EPSCoR areas of focus. Moreover, these faculty members were eagerly engaging in and disseminating research, effectively using the statewide resources and the Rhode Island NSF EPSCoR Core Facilities to move their programs forward, mentoring students, and integrating their research and teaching efforts as true “teacher-scholars”. The panel also saw strategic choices being made regarding equipment purchases at several of the PUIs – equipment that was used to advance the faculty-student research in areas directly tied to the Rhode Island NSF EPSCoR themes and in other areas. This equipment was also being used extensively for teaching, with students receiving significant hands-on experience on the new equipment. Thus, the new equipment not only directly supports the goal of building research capacity, but it is also providing the opportunity for students to gain exposure to state-of-the-art equipment, promoting excitement about science in general, and leading to a greater interest in doing research.

Overall, the panel feels that the PUIs have a solid foundation at their campuses for both conducting significant research and for integrating their research with teaching. While the Rhode Island NSF EPSCoR has a clearly stated mission linked to enhancing the research infrastructure and capacities of the participating institutions, the goals and expectations of the Rhode Island NSF EPSCoR, however, are not as well-defined and communicated as they could be, and these are being interpreted and executed differently at the individual partner institutions and seem unevenly integrated into their own research, educational, and institutional roles within the program. This is a challenge that’s not uncommon for a program of this scale and diversity, but will have to be addressed in order to meet the central goal of elevating the research competitiveness of the state as a whole. Given the strong foundation at many of the PUIs, the AAAS panel has several recommendations to help ensure that the impact and investment of the Rhode Island NSF EPSCoR is sustained at the PUIs. In particular, these recommendations are designed to ensure that Rhode Island NSF EPSCoR funding is leveraged as best as possible to influence a large number of faculty members and departments/divisions, as well as the overall learning and scholarly culture among the science, technology, engineering, and mathematics (STEM) programs at the PUI partner institutions.

Define the goals of Rhode Island NSF EPSCoR with respect to PUIs. The Rhode Island NSF EPSCoR needs to strategically focus the program, particularly on the high-level priorities; goals and expectations need to be clarified and clearly communicated with the PUI partners, given the differing institutional missions of the partners.

Strategic Planning at the PUIs and Alignment with Rhode Island NSF EPSCoR. Each of the PUIs needs to clearly outline what their goals are for Rhode Island NSF EPSCoR integration and how the institutions can leverage the outcomes and support from the grant to enhance their own institutional short- and long-term goals.

Support for institutional teams of faculty members and administrators to attend workshops on Institutionalizing Undergraduate Research. The panel saw examples of how this institutional approach, which takes years to develop, is enabling one of the PUIs to maximize the impact of the Rhode Island NSF EPSCoR investments in ways that are realizing both the institution’s goals
and those of Rhode Island NSF EPSCoR. This approach is recommended for the other PUIs or for the consortium as a whole.

*Program-level and institutional-level assessment.* This includes developing an evaluation framework that compares outcomes of the current RII award to a comparable baseline. Clarification of the benchmarks and achievements with respect to their connection to the grant is recommended.

*Enhance Familiarity and Understanding of the Interconnectedness of Research and Teaching.* The AAAS panel recommends that all participating faculty members and administrators at the PUIs, as well as the Rhode Island NSF EPSCoR, become familiar with the literature that demonstrates teaching and research as synergistic, rather than separate and competing endeavors, and on how undergraduate research enhances teaching and learning. Rhode Island NSF EPSCoR could help sponsor/support such efforts, because the development of such an understanding of the interconnectedness of research and teaching at all of the partner institutions will help ensure that the Rhode Island NSF EPSCoR outcomes and investments are realized.

It is clear to the AAAS panel that some the Rhode Island PUIs are farther along in their development and support of a scholarly culture than other PUI partners in the consortium. Some of the institutions have been intentionally and strategically working on this, and the experiences and lessons-learned by these PUIs could be leveraged to help their fellow PUIs in the Rhode Island NSF EPSCoR.

As a concluding point, the AAAS panel further encourages the program to carefully and reflectively think about what research competitiveness is and what this means for Rhode Island NSF EPSCoR (e.g., as measured by total research dollars and/or number of PIs doing research to support the mission of the partner institutions), and to engage the partner institutions in this dialogue and decision-making via the program’s governance structure.
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I. Introduction

I-A. Review Process

In June 2012, the AAAS Research Competitiveness Program convened an independent panel to conduct a Year 2 review of the Rhode Island NSF EPSCoR Research Infrastructure Improvement (RII) Award ($20 million/5-year cooperative agreement with NSF, 2010-2015). This site visit builds on yearly reviews that AAAS has conducted for the Rhode Island NSF EPSCoR since its inception in 2005. Last year’s AAAS report (2011) provided a baseline that outlines the assets and opportunities for growth in a number of the core elements of the program: research infrastructure (core facilities); undergraduate institutions and research; design, data visualization and collaboration; program leadership; and evaluation.

For the 2012 review, the AAAS review panel took a focused look at the activities and integration of the primarily undergraduate institutions (PUIs) within Rhode Island NSF EPSCoR. In particular, the panel examined the following areas with respect to the PUIs: i) what are the goals of the PUIs and how well are the partners positioned to achieve them during the current RII award; and ii) what is the current capacity for conducting research at the PUIs? The AAAS panel was also asked to look at the progress and integration of the Rhode Island School of Design in the Rhode Island NSF EPSCoR. The site visit agenda is provided as Appendix I. To reflect the in-depth expertise required for this review, the AAAS panel included thought leaders in research integration at PUIs, as well as research collaborations in science and art/design (panel members and affiliation on title page). While this year’s review did not directly focus on core facilities, scientific research questions, and education and outreach, the report discusses these areas in terms of how they relate to the research efforts at the PUIs.

The panel had an opportunity to hear from most of the stakeholders of the Rhode Island NSF EPSCoR partnership, including face-to-face meetings with the leadership team and steering committees members, as well as departmental faculty members and institutional leadership from all the PUIs. In addition to the site visit interviews, the AAAS panel rounded out their understanding of the program by reviewing the research proposal, Rhode Island NSF EPSCoR annual reports, and the 2011 AAAS panel report to inform their findings and recommendations. In this report, the AAAS panel reflects on the changes in the program since its previous visit, the stewardship of the program and potential for growth, and provides collective recommendations on how to strengthen research capacity at the PUIs.

I-B. Program-Level Overview

The Rhode Island NSF EPSCoR has as its purpose to “build science, technology, innovation, and diffusion capabilities in Rhode Island in a manner that enables the state to be nationally and globally competitive.” A strong consortium is envisioned that includes almost all institutions of higher education in the state working closely with each other and with the state Science and Technology Advisory Council (STAC) and other statewide networks (e.g. NIH-IDEA, OSHEAN, the pre-K to 16 council, RI-CIE, OSCAR) that are defined in the Science and Technology Strategic Plan for Rhode Island (http://stac.ri.gov/state-science-and-technology-plan/). In its current form, nine higher education institutions are involved in the partnership. The partnership comprises two research-intensive institutions – Brown University and the University of Rhode Island (URI) – and seven PUIs, including two public institutions, Rhode Island College (RIC) and the Community College of Rhode Island (CCRI); and five private ones including Bryant University, Providence College, Rhode Island School of Design (RISD), Roger Williams University, and Salve Regina University.

Central to the consortium are three core facilities that were developed during the first NSF EPSCoR RII grant and are accessible to faculty members and students from all of the partner institutions: i) the Marine Life Science Facility at the URI Narragansett Bay Campus, ii) the Genomics & Sequencing Center at
URI, Kingston, and iii) the Proteomics Center at Brown University. These Cores support the research thematic areas related to marine life responses and adaptation to climate change. This theme is not only appropriate given that Rhode Island is a coastal state but also the economic stability of the state has depended on the ocean and bay for its tourism and fishing industries and these are now potentially threatened by climate change impacts (both predicted and as of yet poorly understood) on the ocean properties and marine life.

II. Findings and Recommendations

II-A. Strategic Approach and Goals

The Rhode Island NSF EPSCoR has a clearly stated mission and vision linked to enhancing the research infrastructure and capacities of the participating institutions within the state of Rhode Island. However, while a number of goals are stated in writing or were discussed with the AAAS panel during the site visit, the overarching goals and expectations of the Rhode Island NSF EPSCoR are interpreted and executed differently at the individual partner institutions and seemed unevenly integrated into their own research, educational, and institutional roles within the program. This is a challenge that’s not uncommon for a program of this scale and diversity, but will have to be addressed in order to meet the central goal of elevating the research competitiveness of the state as a whole.

Given the PUIs’ stated institutional missions and histories focused on teaching and/or the integration of teaching and research, it is expected that the research-focused program of NSF EPSCoR will not always, readily, or consistently cohere with those missions. Nevertheless, there should be a clear articulation and prioritization of the goals, the goals should be measurable, and corresponding objectives and initiatives should be mapped and assessed. It is especially critical for long-term sustainability to ensure that there is a greater emphasis on clarifying goals and expectations to participating institutions, as well as strategically leveraging resources to enable institutional investments and commitment to the research program. To illustrate the panel’s concern, very little is mentioned in the Rhode Island NSF EPSCoR strategic plan which was revised last year, about a specific role for the PUIs or even the goals they should be aiming for (besides developing the future workforce for innovation in science and technology) while the other partners, URI, Brown, and RISD are mentioned explicitly. The omission of the PUIs from the strategic plan leaves the perception that their contributions to the overall network are not fully appreciated yet. This may be unintentional but the perceptions of partners are important to take into consideration.

Recommendations:

1) With respect to the role of the PUIs, the Rhode Island NSF EPSCoR needs to strategically focus the program, particularly on the high-level priorities; goals and expectations need to be clarified and clearly communicated with the PUI partners, given the differing institutional missions of the partners.

2) The Rhode Island NSF EPSCoR leadership should develop a plan that strategically coordinates and periodically calibrates its efforts with the institutional leadership of the PUIs to enable the integration of Rhode Island NSF EPSCoR goals and priorities into the larger missions of these institutions. This plan should be developed in collaboration with representatives from the partner institutions.

2) Each of the PUIs needs to clearly outline what their goals are for Rhode Island NSF EPSCoR integration and how the institutions can leverage the outcomes and support from the grant to enhance their own institutional short- and long-term goals.
3) Coming into year 3, each of the PUIs should re-evaluate their yearly budgets and assess if the planned resource allocation still makes sense. The Rhode Island NSF EPSCoR needs to clearly communicate to the partners what is possible with respect to budget modifications and be positively flexible about this if the changes are needed and will be more effective at realizing their goals. This is particularly relevant for some of the PUIs, which have relatively little experience with large federal grants or where research is a relatively new endeavor.

4) There is a need for better program-level and institutional-level assessment. This includes developing an evaluation framework that compares outcomes of the current Research Infrastructure Improvement (RII) award to a comparable baseline. For instance, what were the number of publications in a year before the current RII award? Were these publications directly related to the overarching marine/climate change research questions or total publications from the departments involved? What were the number of students engaged in research per year? Clarification of the benchmarks and achievements with respect to their connection to the grant is recommended.

5) Asset mapping for equipment and specialized facilities has been completed and is available on the project website. This type of inventory should also include the research interests and expertise of all of the faculty members within the RI-EPSCoR—including faculty at the PUIs, additional facilities at the PUIs, and opportunities for faculty and staff professional development, as well as for student training.

6) Sharing of best practices among faculty members and administrators should become more commonplace. To help facilitate this, the Rhode Island NSF EPSCoR leadership could convene regular meetings with institutional leadership (e.g., presidents, provosts, deans, etc.) especially to discuss relevance and challenges of fulfilling the Rhode Island NSF EPSCoR goals at their own institutions.

II-B. Rhode Island NSF EPSCoR Leadership and Management

The AAAS panel had the opportunity to meet with Dr. Jennifer Specker, Principal Investigator, as well as members of the Steering Committee various times throughout the week. In addition, during a final debriefing session, the panel had the chance to engage in conversation with Dr. Peter Alfonso, Rhode Island NSF EPSCoR Project Director and Dr. Jennifer Specker to get further clarification on project goals and governance.

Over the past year, there has been significant reorganization in the governance of the Rhode Island NSF EPSCoR. Most notably, Jennifer Specker was given the title of PI (formerly Associate Project Director), and two co-PIs (Mary Sullivan and Charlie Cannon) were added to the Steering Committee. In reviewing the annual Rhode Island NSF EPSCoR reports going back to the first grant, it appears that there have been several leadership changes in a relatively short time. Hopefully, these latest strategic appointments will remain in place for the duration of the second grant period to provide more stability in the leadership. In addition, the Director of the EPSCoR Academy, Dr Philip Veillette of URI, has now been selected and he has spent much of the past year clarifying his role, meeting with key partner members, and working with the various coordinators.

In discussions with Dr. Specker, she mentioned that the Rhode Island NSF EPSCoR Academy would have a shift in its scope to become more focused on the research questions and the project activities at the college- and university-level, rather than focused on outreach to 6th-12th grades and connecting students to experiences with local companies. Dr. Philip Veillette, with his research and university-level teaching experience, was thought to have the background to help promote this shift of emphasis. The AAAS panel assumes that ongoing outreach with K-12 teachers and students will still occur, but this assumption should be clarified.
Recommendations:

1) Reporting Structure of the Partner Liaisons – The organizational structure as described in the Rhode Island NSF EPSCoR Strategic Plan for 2010-2015 (Nov 30, 2011) provides improved clarification of the governance from previous iterations. The graphics of the organizational structure show that the Partner Liaisons report to the EPSCoR Academy, but the AAAS panel heard repeatedly that Partner Liaisons report to and interact with the Steering Committee. This should be clarified and the rationale for whichever line of reporting is chosen be noted.

2) Roles and Scope of Key Personnel – Brief descriptions of the roles of Academy Director, Steering Committee, and Coordinators are provided in the Strategic Plan and on the Rhode Island NSF EPSCoR website. However, the AAAS panel is still unclear about the specifics of the role of Academy Director, and there seems to be some overlap in functions. For example, both Mary Sullivan (in her role as Director of the Rhode Island Stem Center) and Tim Pelletier are working with science education and outreach with K-12 teachers. Both Philip Veillette and Tim Pelletier seem to be conducting outreach and the “road shows” to the various partner institutions, especially the PUIs, and both Philip Veillette and James Lemire work on the SURF program. More detailed position descriptions, which clearly delineate the individual responsibilities, may be available, but the AAAS panel did not have access to these. It is also unclear how accountability is measured; in other words, i) who evaluates the performance work of the coordinators, ii) who evaluates the Academy Director and program administration staff, and iii) on what schedule do such evaluations take place? It is recommended that position descriptions be written and regularly reviewed to ensure effective use of these important human resources in meeting the Rhode Island NSF EPSCoR project goals. Personnel reviews are not only important for accountability, but also for professional development.

3) Representing the Research-based Interests, Foci, and Accomplishments of the PUIs – Given the importance of science education within the Rhode Island NSF EPSCoR goals, the appointment of Mary Sullivan as a project co-PI and member of the Steering Committee makes good sense. The AAAS panel has every indication that she takes this role seriously and is working hard to learn a lot in a short period of time. However, we heard from several partner institution members that they view Mary as the PUI liaison to the Steering Committee and went to her with their research issues, questions, and concerns. Since the focus of the Rhode Island NSF EPSCoR research questions are life-science focused and Mary is from a Math department and her area of scholarship is related to pedagogy, the Steering Committee would also benefit from having a PUI representative that is engaged in discovery-based research.

II-C. Institutional Leadership at the PUIs

While not specifically mentioned in the Rhode Island NSF EPSCoR strategic plan, leadership at the individual PUI campuses is also important to achieve the goals of enhanced infrastructure for science research and education and for workforce development. This is particularly true if one of the measureable outcomes of success for the Rhode Island NSF EPSCoR grant is an increased number of funded external grants from the partner institutions. Campus administrators were present at many of the AAAS panel’s meetings at the individual PUI campuses. In some cases, these individuals expressed a clear vision for the sciences, faculty research, faculty-student collaborative research, and public outreach, and these leaders articulated the value that being part of the Rhode Island NSF EPSCoR consortium brought to their institution and what their institution brought to the Rhode Island NSF EPSCoR. Many, however, had not specifically thought about specific strategies for best leveraging this opportunity for the future.

At the department level, there seemed to be a few key faculty members who were most directly involved with and benefactors of the Rhode Island NSF EPSCoR RII award. There were differing views of what could or couldn’t be “counted” under Rhode Island NSF EPSCoR. There was some resentment expressed
that large consortial grants left many out, instead of thinking about how a department or science program as a whole could benefit in the long-term. The essence of the Rhode Island NSF EPSCoR is interdisciplinary research, but there were varying degrees of how intentionally either interdisciplinarity or research in general was being incorporated into the curriculum to a) enhance learning, b) better prepare students for engaging in research, and c) advance the research agendas of faculty members in the sciences. In short, it did not seem as though most departments or science divisions had developed short- and long-range strategic planning for moving forward to sustain the momentum contributed by the Rhode Island NSF EPSCoR. Challenges could quickly be identified, but department- or division-wide discussions on developing research-rich curricula, mentoring programs for faculty, or enhancing interdisciplinary research opportunities were not always evident.

**Recommendations:**

1) **Enhancing Familiarity and Understanding of the Interconnectedness of Research and Teaching** – The AAAS panel recommends that all participating faculty members and administrators at the PUIs, as well as the Rhode Island NSF EPSCoR, become familiar with the literature that demonstrates teaching and research as synergistic, rather than separate and competing endeavors, and on how undergraduate research enhances teaching and learning. The departments and science divisions could hold a series of workshops or a retreat to develop curricular innovations to pilot and clearly stated goals, measurable outcomes, and assessment plans for long-term enhancement of teaching, learning, and research. Rhode Island NSF EPSCoR could help sponsor/support such efforts, because the development of such an understanding of the interconnectedness of research and teaching at all of the partner institutions will help ensure that the Rhode Island NSF EPSCoR outcomes and investments are realized. A list of resources to assist in this is provided at the end of this report (all but one are available online free), and several related recommendations are outlined below in Section II-D.

**II-D. Capacity of the PUIs for Conducting Research**

During the AAAS panel’s conversations with faculty members, administrators, students, and staff members from the Rhode Island NSF EPSCoR’s PUIs, the reviewers were impressed with the level of commitment and dedication to research and teaching at many of the campuses, and to their contribution to the overall achievements of the Rhode Island NSF EPSCoR. In short, the PUI partners in the Rhode Island NSF EPSCoR have the capacity for conducting high-quality research and to do this at a level that is commensurate with the missions of both their own institutions and the Rhode Island NSF EPSCoR. The AAAS panel observed that the overarching quality of the faculty, students, space and instrumentation, and administrative support are strong at many of the PUIs. For example, the panel saw a healthy number of recently renovated laboratory spaces, the acquisition of new equipment, faculty hires with research areas directly tied to the Rhode Island NSF EPSCoR areas of focus, and significant enthusiasm among a number of faculty members for engaging in and disseminating research, effectively using the statewide resources and the Rhode Island NSF EPSCoR Cores to move their programs forward, mentoring students, integrating their research and teaching efforts (i.e., serving as true “teacher-scholars”).

The PUI partners are positioned very well to realize their research potential, and the Rhode Island NSF EPSCoR can help catalyze and facilitate this moving forward via the strategic allocation of resources as noted below. Given this strong foundation, the AAAS panel has several recommendations to help ensure that the impact and investment of the Rhode Island NSF EPSCoR is sustained at the PUIs. In particular, these recommendations are designed to ensure that Rhode Island NSF EPSCoR funding is leveraged as best as possible to influence a large number of faculty members and departments/divisions, as well as the overall learning and scholarly culture among the science, technology, engineering, and mathematics (STEM) programs at the PUI partner institutions.
II-D-1. Goals and Desired Outcomes

The Rhode Island NSF EPSCoR program distributes funds for undergraduate research initiatives to the different PUI partner institutions, and these funds are used in different ways at each institution. The AAAS panel commends the Rhode Island NSF EPSCoR program on this approach because it allows each institution to strategically use funds in ways that are consistent with each institution’s mission, culture, strengths, and areas of need. However, it was not clear to the panel what the goals and desired outcomes are for each of the PUI campuses with regard to their undergraduate research initiatives. As described in the 2011 AAAS panel report, developing a clear sense of what the Rhode Island NSF EPSCoR’s overall goals and desired outcomes are for its various undergraduate research initiatives during the current RII award was needed, but this has still not clearly emerged.

Recommendations:

1) Re-affirm and Clarify the Goals and Essential Outcomes for the Various Undergraduate Research Initiatives – The AAAS review panel encourages the Rhode Island NSF EPSCoR, and each of the PUI partners, to carefully think through, re-affirm, and clarify the goals and desired outcomes that the program wants its undergraduate research initiatives to achieve. Once these are better defined, they should be clearly and consistently communicated.

For example, one of the goals of the Rhode Island NSF EPSCoR that was articulated during the site visit involves increasing the number of grant proposal submissions, and awards received, by the PUIs through the NSF’s Research in Undergraduate Institutions (RUI) designation. In particular, the Rhode Island NSF EPSCoR has conducted a comparative study of the number of RUI grants awarded to peer EPSCoR states in the Northeast, and using these benchmark data, would like to increase the number of NSF-RUI awards being made to Rhode Island’s PUIs. The AAAS panel believes that this is a reasonable and achievable goal, but that the Rhode Island NSF EPSCoR needs to ensure that this goal is clearly communicated, that it is well-aligned with other goals of the Rhode Island NSF EPSCoR, that it is resourced appropriately by the Rhode Island NSF EPSCoR, and that the institutional goals of the PUIs are aligned with those of the Rhode Island NSF EPSCoR.

2) Budget Evaluation – As a result of re-affirming and clarifying their goals, as addressed above in section I-A, the PUIs and Rhode Island NSF EPSCoR should re-evaluate their yearly budgets, assess if the planned resource allocations still make sense, and be flexible about budget modifications if changes are needed to be more effective at realizing their goals.

3) Evaluating Key Outcomes – Evaluating the outcomes of undergraduate research is a complex endeavor. This high-impact scholarly and pedagogical experience directly engages students, faculty members, and institutions. As a result, undergraduate research has a broad range of goals and outcomes that require multifaceted evaluation and assessment approaches and instruments. The AAAS panel encourages the Rhode Island NSF EPSCoR to clearly delineate the key outcomes that the program wants each of its undergraduate research initiatives to achieve, and to focus its evaluation efforts on these. Three example categories are as follows (although Rhode Island NSF EPSCoR may be interested in other categories as well):

   a) Undergraduate Students – It is clear that student engagement in research yields an array of greater outcomes in comparison with those of students who do not participate in research experiences, and the gains for students from traditionally underrepresented groups are even greater when compared to students from majority groups (e.g., Osborn and Karukstis, 2009; Laursen et al., 2010; Lopatto, 2010). Although positive gains can be realized from student involvement in undergraduate research in a spectrum of developmental areas (e.g., cognitive and intellectual growth; professional growth and advancement; personal growth), it is unrealistic for the Rhode Island NSF EPSCoR to evaluate the impact of its program on all of the possible outcomes. Rather, the outcomes that the Rhode Island NSF EPSCoR
is most interested in as essential to program success should be clearly defined. For example, the primary outcomes desired by Rhode Island NSF EPSCoR may be increased retention and graduation of minority students, and/or increased rates of placement into research-oriented careers or post-baccalaureate degrees. If so, these should be preferentially assessed.

b) Impact of Undergraduate Research on Faculty Engagement and Research Productivity – It is clear that faculty engagement in undergraduate research yields an array of benefits in several key areas, including: achieving research and scholarly outcomes, integrating scholarship and teaching, enhancing mentoring and teaching, and increasing job satisfaction and personal development (e.g., Osborn and Karukstis, 2009). What are the primary outcomes that the Rhode Island NSF EPSCoR and each of the PUI partner campuses want to achieve for their faculty participants? Have there been increases in faculty-student co-authored publications, increases in the number of undergraduates participating in research, new sources of research funding, including increased grant proposal submissions to external agencies, etc.?

c) Undergraduate Curriculum – It is clear that the integration of research experiences directly into courses and curricula significantly enriches the baccalaureate degree and increases learning outcomes for essential scientific concepts and principles (e.g., Karukstis and Elgren, 2007). Some funding is being used to enhance curriculum, but what specific outcomes does the Rhode Island NSF EPSCoR overall and the partner PUIs want to achieve and how is it measuring these? Is a research-rich curriculum a goal? If so, to what extent and over what period of time can it realistically be achieved? Objectives for incorporating research into the curriculum should be clearly stated if this is a Rhode Island NSF EPSCoR or individual institution goal.

4) Summer Undergraduate Research Program – Given the scope of the Rhode Island NSF EPSCoR’s summer undergraduate research program, as well as student engagement in undergraduate research during the academic year at most of the PUIs, the AAAS panel recommends that the Rhode Island NSF EPSCoR explore opportunities to participate in a national-level survey on undergraduate research experience and impact. Taking into account the outcomes that the Rhode Island NSF EPSCoR wants to achieve through its summer program, this approach would allow Rhode Island NSF EPSCoR to capitalize on already-developed evaluation instruments and, at the same time, benchmark its program with selected peer/aspirant institutions. There are two national-level surveys, listed below, that have been developed in recent years that Rhode Island NSF EPSCoR might want to consider. It appears that one of the PUI partners (Roger Williams University) is already participating in the SURE survey.

a) SURE – the Survey of Undergraduate Research Experiences is a survey for undergraduates who have recently completed a summer undergraduate research experience. This survey has been developed by Dr. David Lopatto and colleagues (Psychology Department at Grinnell College, Grinnell, Iowa) with funding from the Howard Hughes Medical Institute. In addition to the Survey of Undergraduate Research Experiences, now in its third iteration (SURE III), Dr. Lopatto’s group has developed a research follow-up survey to the SURE, as well as CURE – Classroom Undergraduate Research Experience survey. Detailed information about these surveys and how to participate is available at: http://www.grinnell.edu/academic/psychology/faculty/dl/securecure

b) URSSA – the Undergraduate Research Student Self-Assessment is a more recently developed instrument. This survey has been developed by Dr. Anne-Barrie Hunter and colleagues (Ethnography & Evaluation Research at the University of Colorado) with funding from the National Science Foundation. Information about this survey and how to participate is available at: http://spot.colorado.edu/~laursen/accessURSSA.html

II-D-2. Developing and Strengthening a Culture of Research/Undergraduate Research at the PUIs
It is clear to the AAAS panel that some the Rhode Island PUIs are farther along in their development and support of a scholarly culture than other PUI partners in the consortium. Some of the institutions have been intentionally and strategically working on this, and the experiences and lessons-learned by these PUIs could be leveraged to help their fellow PUIs in the Rhode Island NSF EPSCoR.

For example, Providence College benefitted tremendously from sending an institutional team of faculty members and administrators to attend a workshop on “Institutionalizing Undergraduate Research” in the fall of 2008, which was sponsored by the Council on Undergraduate Research (CUR). Attendance at that workshop, along with the teams’ action plan that was developed at the workshop, helped Providence College in articulating a series of strategic goals for institutionalizing undergraduate research, as well as developing strategies to achieve those goals. Providence’s engagement in the CUR workshop contributed to building and enhancing a currently vibrant culture that supports and promotes undergraduate research in the sciences and across the institution. This institutional approach, that was initiated years ago, is enabling Providence College to maximize the impact of the Rhode Island NSF EPSCoR investments in ways that are realizing both the institution’s goals and those of Rhode Island NSF EPSCoR.

In another example, the AAAS panel observed that strategic choices had been made regarding equipment purchases at several of the PUIs – equipment that was used to advance the faculty-student research in areas directly tied to the Rhode Island NSF EPSCoR themes and in other areas. This equipment was also being used extensively for teaching, with students receiving significant hands-on experience on the new equipment. Thus, the new equipment not only directly supports the goal of building research capacity, but it is also providing the opportunity for students to gain exposure to state-of-the-art equipment, promoting excitement about science in general, and leading to a greater interest in doing research.

**Recommendations:**

1) **Hold a Focused Workshop on Undergraduate Research for the Rhode Island NSF EPSCoR PUIs** – The AAAS panel recommends that the Rhode Island NSF EPSCoR engage CUR to conduct a workshop for the all of the partner PUIs. This would allow each PUI, and their key faculty and administrative leaders, to directly participate in the workshop and to create strategically oriented action plans to institutionalize undergraduate research at each institution and across the consortium. Moreover, CUR could offer a workshop curriculum that is customized, or tailored, specifically for the Rhode Island NSF EPSCoR PUIs, taking into account the institutions’ natural stages of evolution, their particular strengths and challenges, etc. For example, breakout sessions could be designed specifically for the following groups/topics: for academic deans; for academic department chairs; for specific groups of disciplinary fields; for integrating undergraduate research into curricula, into faculty workload, into tenure and promotion documents; developing synergies with graduate-level work; just to name a few. Several other states’ NSF-EPSCoR and NIH-INBRE programs have utilized this approach to work with CUR, and it has been successful in helping to create and strengthen the institutional infrastructure and culture for research.

2) **Provide Grant-writing Support for the PUIs** – As noted above, the Rhode Island NSF EPSCoR has indicated that one of its goals is to increase the number of grant proposal submissions coming from – and grants awarded to – the PUIs. In particular, the Rhode Island NSF EPSCoR would like to increase the number of NSF-RUI awards being made to Rhode Island’s PUIs. Given the research potential and current research capacity at the PUIs, the AAAS panel thinks that this is a reasonable goal, but also recommends that the Rhode Island NSF EPSCoR will need to provide more grant-writing support to the PUIs and the Rhode Island NSF EPSCoR-supported faculty members in moving forward. This will be needed, because only a few of the PUI campuses have research administrators/grants officers, not all of the PUI campuses have negotiated indirect costs rates with the federal government nor internal policies for distribution of recovered funds, and several of the PUI campuses have limited experience and track records with grant-writing and grant-management. Moreover, a number of faculty members and departments at the PUIs may be content with internal research funds now being supplemented by Rhode
Island NSF EPSCoR funds. This is not a sustainable model of funding faculty or faculty-student research, so helping these faculty members appreciate the need for grant-writing and providing effective strategies to do so will be a very valuable investment of RI EPSCoR resources. Several strategies that the Rhode Island NSF EPSCoR may want to consider are listed below. A number of these would be natural partnership opportunities with STAC.

   a) **Sponsor a workshop specifically designed for PUI research administrators/grants officers.** At this workshop, external speakers from PUIs with successful grant-writing track records, as well as the current research administrators from the RI PUIs, could give presentations focused on best-practices and lessons-learned. In addition to internal contacts, the Rhode Island NSF EPSCoR might want to contact either the National Council for University Research Administrators (NCURA; [http://www.ncura.edu/content/](http://www.ncura.edu/content/)) and/or the Society of Research Administrators (SRA; [http://www.srainternational.org/](http://www.srainternational.org/)) for general resources and suggestions for consultants and speakers from PUIs with highly successful programs.

   b) **Hire a state-wide research administrator whose role is to support and promote grant-writing efforts at the PUIs.** Some states have created such a position, where the individual travels throughout the state to the various institutions to meet directly with faculty members and administrators and help with proposal preparation, submission, etc. Such a position would be particularly helpful for those PUI institutions in Rhode Island that do not have the resources to hire a local research administrator yet.

   c) **Help each PUI complete the process to negotiate an indirect costs rate with the federal government.** Several Rhode Island PUIs have recently completed the process and could also provide help to their peers.

   d) **Hold a grant-writing workshop in the State specifically designed for Rhode Island PUI faculty members.** At this workshop, PUI faculty members with successful grant-writing track records, both from Rhode Island and external to the State, could be invited to speak. Issues that are specific to PUIs could be included in the workshop (e.g., strategies to prepare a successful RUI Impact Statement).

   e) **Directly support Rhode Island PUI faculty members to attend funding-related conferences and workshops in Washington, DC and elsewhere.**

   f) **Invite NSF program officers to visit Rhode Island, and host the presentations specifically at the PUI campuses.** These visits could focus on successful grant-writing strategies, funding opportunities that are relevant or specific to PUIs (e.g., RUI, ROA), and proposal elements that are relevant or specific to PUIs (e.g., RUI Impact Statement).

3) **Sustained Contact with Senior Leadership** at the PUIs – The AAAS panel is impressed by the engagement, enthusiasm, and passion of the faculty and staff representatives from the PUI partner institutions, as well as the linkages that the Rhode Island NSF EPSCoR leadership has made with the senior leaders at the partner campuses. The panel recommends that the Rhode Island NSF EPSCoR leadership continue to prioritize strengthening its relationships with the senior leadership on each partner campus (such as Deans, Provosts and Presidents). This ongoing process of sharing programmatic information, sharing the accolades of the students and faculty members from the PUIs who have engaged in Rhode Island NSF EPSCoR, and discussing how the program is helping each PUI realize its outcomes and strategic aspirations will help build internal support. This will, in turn, help shift the internal landscape and culture for the integration of undergraduate research in ways that will be sustainable for the long-term and beyond the scope of those science faculty members and departments directly involved with Rhode Island NSF EPSCoR.

4) **Expanded Contact with other Departments** – The AAAS panel recommends a slightly expanded role for Steering Committee members from the PUI partner campuses. In addition to providing guidance and
support for the EPSCoR-funded individuals and departments, it would be valuable for the Steering Committee members to visit other science, technology, engineering, and mathematics (STEM) departments/divisions and to serve as an ‘ambassador’ or ‘cheerleader’ for the Rhode Island NSF EPSCoR. Most faculty members in these other departments will have little idea about what types of support and programs are available from the Rhode Island NSF EPSCoR and little idea that they, too, could benefit from some of these.

5) Focused Reviews at the PUIs – The Rhode Island NSF EPSCoR would benefit from encouraging (and potentially helping to support) institution-specific external reviews to help each partner PUI campus move forward strategically in realizing its goals and outcomes for the undergraduate research initiatives of the Rhode Island NSF EPSCoR. These reviews would help ensure that the Rhode Island NSF EPSCoR-funded initiatives are well-aligned with the mission, culture, and resources of each of the partner institutions, as well as help provide guidance so that these efforts are strategically advanced to ensure sustainability in the long-term. As noted in recommendations above, there is strong interest among the faculty and administrative leaders at the PUIs for more deeply embedding undergraduate research into the curriculum and overall programs at these campuses. If these reviews are pursued, the AAAS panel recommends that the review teams for each of the PUIs have strong representation from peer institutions. As such, the reviewers will have a comprehensive understanding of each institution’s challenges and opportunities (such as what the basic teaching load is, what the institutional and scholarly culture is like, what the research expectation is, and what the research infrastructure is like). For example, a review team for CCRI should include community college faculty members who have been successful in implementing undergraduate research programs, integrating research into the curriculum at two-year institutions, and providing professional development for faculty members at community colleges. Research experience/research exposure for students at two-year institutions does not have to be limited to the summer SURF program (e.g., see Cejda, 2009, http://www.cur.org/urcc/).

6) Support for Faculty Mentoring – Currently there is not much available for faculty mentors regarding development of effective mentoring skills, sharing of best-practices, etc. Consideration should be given to the potential value and receptivity of faculty members to the development of core skills for effective mentoring. The AAAS panel recommends integrating a mentor development and resource component into the program. For example, at the very least, mentor meetings could be scheduled once per summer to share program information and provide the opportunity for mentors to share best-practices and lessons-learned with each other in a relatively informal way. Similarly, during the academic year a twice-annual or annual meeting for mentors could be scheduled, or a Rhode Island NSF EPSCoR-supported workshop on mentoring could be scheduled. In addition, the Rhode Island NSF EPSCoR could prepare some key resource materials for mentors (e.g., websites, such as Entering Mentoring, www.researchmentortraining.org; and papers, such as Malachowski, 1996). In short, more effective mentoring will lead to more successful and abundant research results, which, in turn, will help realize greater scholarly successes (e.g., publications and grants) and scholarly cultures at the PUIs and for Rhode Island NSF EPSCoR.

7) Resources from the Council on Undergraduate Research (CUR) – The AAAS panel recommends that Rhode Island NSF EPSCoR continue and expand its utilization of the resources available from CUR, a national organization with over 8,000 individual members and 700 institutional members that together represent over 900 institutions of all types. CUR’s mission is to support and promote high-quality undergraduate student-faculty collaborative research and scholarship. As noted above, some institutions and individuals currently involved in the Rhode Island NSF EPSCoR already have some knowledge of CUR; Providence College has participated in a CUR workshop. The AAAS panel commends Providence on their successful efforts, and notes that the Rhode Island NSF EPSCoR, including the faculty at the PUI partner campuses, would benefit from many of the other resources available through CUR (e.g., meetings, conferences, workshops, publications, specialized consultancies for PUIs). For example, in addition to the tailored workshop noted above, the Rhode Island NSF EPSCoR might want to consider supporting the attendance of several of its Steering Committee members, faculty investigators, and other faculty
members from the PUI partner campuses to attend CUR’s Dialogue meeting in Washington, DC (designed for attendees to learn about grant and other funding opportunities), and/or a weekend workshop that is focused on new faculty members in the natural sciences. More information is available on the organization’s website: [http://www.cur.org/](http://www.cur.org/).

II-D-3. Integrating the PUIs into the Rhode Island NSF EPSCoR Research Themes

As per the Research Infrastructure Improvement (RII) grant proposal and strategic plan, Rhode Island NSF EPSCoR has articulated three research questions related to the impact of climate change on marine microbiology and ecology. The AAAS panel heard a sampling of research topics and projects that were being undertaken at the PUIs, including a few exemplary projects, but in general, the panel did not get a good sense of how collaborations across the institutions are being developed, how team members across the consortium communicate with each other, and what types of outreach efforts are made to bring-in relevant research and researchers from the PUIs.

Recommendations:

1) Connecting and Listing PUI Faculty Members with Colleagues in the Research Theme Networks – The Rhode Island NSF EPSCoR should provide leadership to help enable researchers from the PUIs to find each other or a colleague at one of the research-intensive institutions that might share some common interests. At a minimum, faculty members who are working on research related to the central questions should be included on the research question team lists.

II-E. Integration of RISD into the Network

The Rhode Island NSF EPSCoR is unique among NSF EPSCoR in its inclusion and active integration of an art and design school, the Rhode Island School of Design (RISD), as a core partner. In addition to acknowledging the role of art and design research for competitive advantage in the new economy, the participation of RISD in the EPSCoR also signals an understanding of the role of art and design in enhancing the pedagogical and research objectives of science and technology.

The stated research goals of RISD in the Rhode Island NSF EPSCoR are to: i) make science visible by developing visual techniques and communication strategies for scientists; ii) make science accessible by developing visual techniques and communication strategies to communicate the significance of scientific findings to broader audiences; iii) create collaborative environments by facilitating successful interdisciplinary research among artists, designers and scientists; and iv) promote STEM to STEAM by demonstrating the value of art, design, science collaborations for research and education in the STEM disciplines. These goals are commensurate with the unique research strengths that the faculty and students at RISD bring to the Rhode Island NSF EPSCoR but also provide a platform for RISD to become a principal partner in support of the broader impacts of the entire consortium.

It was readily apparent that RISD has fully embraced the opportunity of partnering with Rhode Island NSF EPSCoR to institutionalize both a strong research agenda and the corresponding pedagogical changes within the school. In addition to pioneering an effort of what they have called the ‘STEM to STEAM’ initiative to support the integration of art and design in the learning and teaching of STEM, and vice versa, RISD has led a national dialogue on this topic over the last year, with the President of RISD, John Maeda, taking a personal lead in these efforts. The STEM to STEAM initiative is embodied pedagogically in the form of several science-related courses that have successfully been taught over the last year. There have been continual refinements of RISD’s existing liberal arts offerings to ensure calibration with the imperatives of STEAM. In addition to the classes developed and taught by RISD faculty members, the school continues to offer one course (Digital Nature) that is jointly taught by RISD and URI faculty members. RISD has also significantly enhanced its science facilities with a new aquarium and new microscopy/imaging equipment for the close observation, study, and creative
investigations of marine life. RISD has also committed to active dissemination of its EPSCoR-related work through a number of public events including a panel discussion on colors in the arts and sciences at the RISD Museum, a presentation by the Rhode Island NSF EPSCoR Co-PI at the 2012 AAAS annual conference and a symposium, and a Science Unsummit 2012 in Arlington. There are also plans for an important workshop on evolutionary gene networks and visualization in October 2012. It is clear that the RISD has institutionally integrated the values of the Rhode Island NSF EPSCoR in building research capacity and infrastructure within.

A key initiative of the past year for RISD, as part of Rhode Island NSF EPSCoR, has been the Scientist-in-Residence at the school – a marine genomics scientist from URI, Dr. Marta Gomz-Chiarri who was in residence for 2011-2012. The focus of the residence was to enable the scientist to engage with the faculty and student community at RISD with her work, while providing her with an opportunity to understand and draw upon RISD’s faculty’s and students’ creative practices and methods. The scientist-in-residence participated in several of the Rhode Island NSF EPSCoR-funded courses but, most importantly, in a course on Experimental Data Visualization taught by RISD faculty member, Shawn Greenlee. This interaction and the resulting outcomes were truly remarkable insofar as the scientist was able to work directly with the students and faculty in the class over an entire semester. As a result, they were collectively able to arrive at a unique visualization solution to a genomic research question that the scientist had been daunted with for quite some time. The visualization solution, developed by a masters student at RISD with advice and careful refinement by the scientist, seems to be elegant, intuitive, and effective. The success of the collaboration has reinforced the scientific merits of the involvement of artists/designers in data visualization challenges. However, there was a lack of effective documentation of, and grounded information on, the evolution and actual interactions that contributed to the success of the collaboration. The next phase of the project that the collaborators intend to work on is to make the solution more robust and versatile, although it was unclear to AAAS panel under what framework or supporting structure such collaboration will be continued.

While it is very commendable that RISD has successfully integrated the values and opportunities of the Rhode Island NSF EPSCoR into the research and pedagogical objectives of the school, it would be useful for RISD to continue to extend its example, reach, and programmatic responses to the other partner institutions that are members of the Rhode Island NSF EPSCoR. For example, the equipment purchases and the digital files would be useful teaching and research resources and would provide additional points of interaction and collaboration with an array of scientists within the broader Rhode Island NSF EPSCoR community.

**Recommendations:**

1) **Sharing Lessons Learned about the Integrations of Art/Design and Science** – The best practices of RISD as a PUI in institutionally integrating EPSCoR could be immensely valuable to the other PUIs in the program. The STEM to STEAM initiative at RISD would also ultimately benefit from extending beyond RISD to engage and involve the active participation of other primarily STEM EPSCoR partner institutions.

2) **Expanding Course Offerings** – As suggested in the AAAS review report of 2011, RISD would benefit from co-developing, jointly offering, and cross-listing more collaborative courses that exemplify STEAM pedagogical principles and objectives.

3) **Expanding RISD’s Role in Research Dissemination** – RISD could also be a principal partner in enabling the broader and more effective dissemination of the research outcomes of the other partner institutions by sharing its best practices in disseminating its own research work in Rhode Island NSF EPSCoR.
4) Better Documenting the Principles that Define Successful Art/Design and Science Collaboration – The success of the Scientist-in-Residence program in exemplifying effective collaboration between art/design and sciences would benefit from garnering all existing documentation of the project to glean best practices for future iterations of similar residence programs. It is also recommended that any future programs have a clear plan for documentation, with the intent to capture best practices and challenges.

5) Clarify and Clearly Define RISD’s Goals and Objectives – As noted in the AAAS panel’s 2011 report, it is critical for the RISD team to continue to clarify the research objective of understanding the nature of art and science collaborations from the objectives of enacting successful art-science collaborations so as to ensure that the deliverables of each are well developed. The promise of RISD’s contribution to Rhode Island NSF EPSCoR is in furthering both objectives.

II-F. The Role of CCRI in the Rhode Island NSF EPSCoR

The AAAS panel understands that much of the funds that are directed to CCRI are used to support the salary of Tim Pelletier, yet much of his work is tied to Rhode Island NSF EPSCoR program-wide efforts. Coupled with the observation that CCRI does not appear to have projected equipment funds from the current RII grant, the panel wonders how CCRI is benefitting from the Rhode Island NSF EPSCoR grant in terms of infrastructure and capacity enhancement? It may be that CCRI solely sees its role as developing the pipeline between middle and high school to four-year higher education programs in the sciences, as well as between two-year college students and the workplace. This is indeed an appropriate role for a community college; however, there are other benefits that could be promoted at CCRI.

Recommendations:

1) Clarifying the Role of CCRI in Rhode Island NSF EPSCoR – The AAAS panel encourages Rhode Island NSF EPSCoR to rethink and perhaps redefine the role of CCRI within the network, especially with respect to the goals of the Rhode Island NSF EPSCoR grant and the S & T Strategic Plan for RI. The panel does recognize the value of CCRI students participating in SURF, as was evident in the excellent reports by two alumni. However, the number of students in science at CCRI is small (less than 500 of the 18,000 students), and a very small number participate in the SURF program. Moreover, the Inreach workshops that the panel heard about are focused on ‘non-major’ students who are not interested in the sciences. Investments in science lab equipment, professional development opportunities for CCRI science faculty in research and developing research-rich curricular experiences, and additional opportunities for student summer research could be supported to further CCRI’s role in meeting Rhode Island NSF EPSCoR’s objectives.

2) Including CCRI in the Focused Workshop on Undergraduate Research for the Rhode Island NSF EPSCoR PUIs – CCRI could be included in the workshop proposed above (section II-D-2, recommendation 1). The workshop, as well as other resources, would provide an opportunity for CCRI faculty members and administrators to learn about models and strategies from community college faculty members who have been successful in implementing undergraduate research programs, integrating research into the curriculum at two-year institutions, and providing professional development for faculty members at community colleges (e.g., see Čejda, 2009, http://www.eur.org/urcc/)

II-G. Core Facilities

The AAAS panel commends the Rhode Island NSF EPSCoR on its successful implementation of the three statewide core facilities during the previous RII award. During this year’s review, the panel learned that the core facilities are well-known on many of the PUI campuses and that several PUI investigators
are using the facilities for their research and courses. The “Road Show” presentations have been very helpful to those select campuses that have been visited to date.

**Recommendations:**

1) *Enhancing the Understanding and Usage of the Cores* – Given that the research cores are an integral component of the Rhode Island NSF EPSCoR, the AAAS panel recommends that the cores continually engage in extensive outreach to the PUI campuses. As noted above, the Rhode Island NSF EPSCoR has a great foundation for this – from those institutions and faculty members that had already experienced one of the “road shows” related to the opportunities provided by the core facilities, the AAAS panel heard rave reviews. However, it will be important that “road show” seminars are offered at the PUIs on a more frequent timetable and that these are broadly advertised to all STEM areas at the PUI campuses, not just the EPSCoR-affiliated individuals. At the current rate, it will be some time before all of the PUI campuses are visited. A detailed plan on how to provide these for the rest of the partner institutions as quickly as possible should be developed.

In addition to the road show visits, the AAAS panel was curious whether the short courses at the cores are still offered as they were in the first grant period? In the year 4 report from the first Rhode Island NSF EPSCoR RII grant, it was noted that over 100 researchers and their students used the core centers. It would be beneficial to have an update on this, as well as a breakout of what percentage of these users came/come from the PUIs. From the AAAS panel’s observations, the genomics core is used the most, but high marks were given to all three facilities and the technical support provided by their staff. The Steering Committee or program staff may consider surveying STEM faculty members from the PUIs to determine what barriers exist that prevent some from using these facilities and/or what professional development opportunities might be offered to inspire new ideas for use of the core facilities. For example, Rhode Island NSF EPSCoR might consider providing funding for PUIs to do this. This could involve a workshop on integrating proteomics or bioinformatics into the curriculum, which could introduce more faculty members and students to this important approach. If they are not already doing so, perhaps faculty members could participate in the Genomics Education Partnership (run out of Washington University, St. Louis, MO) so that more students become exposed to genomics data mining and annotation and, in turn, possibly become inspired to use genomics in a research project.

2) *PUI Faculty Fellowships in the Core Facilities* – The Rhode Island NSF EPSCoR may want to consider developing short-term (e.g., one-week) or longer-term (e.g., summer) ‘fellowships’ for PUI faculty members to visit the core facilities. This would provide the opportunity for more sustained engagement, usage, and promotion of the core facilities. It would be best if these were open more broadly to STEM faculty members, not just the Rhode Island NSF EPSCoR-funded investigators.

**III. Conclusion: Building a Knowledge Community that Facilitates Research Competitiveness**

The AAAS panel congratulates the Rhode Island NSF EPSCoR on its successes to date and encourages the program to capitalize on this moment in time and this report to galvanize its efforts and investments in ways that will build a knowledge community that facilitates research competitiveness. In particular, the panel further encourages the program to carefully and reflectively think about what research competitiveness is and what this means for Rhode Island NSF EPSCoR (e.g., as measured by total research dollars and/or the number of PIs doing research to support the mission of the partner institutions, etc.), and to engage the partner institutions in this dialogue and decision-making via the program’s governance structure.
The Rhode Island NSF EPSCoR is in a unique position to be able to share and leverage the strengths of all of the partner institutions in ways that many other EPSCoR and related programs around country cannot. The relatively close proximity of the Rhode Island NSF EPSCoR partner institutions provides a distinct advantage for facilitating collaborations and for faculty and students to take advantage of the core facilities. Moreover, this close proximity also provides opportunities for mentoring of new faculty members, mid-career faculty members, and students, as well as shared faculty and staff development opportunities. A few examples include grant-writing support, strategic leveraging of the Rhode Island NSF EPSCoR funding to help the program and the partner institutions move ‘to the next level’, technology transfer, development of research-rich curricula, designing appropriate undergraduate research projects, and mentoring of undergraduate students.

Many of the recommendations outlined earlier in this report are offered in the constructive spirit of helping Rhode Island NSF EPSCoR realize this potential.

IV. References Cited and Other Resources

IV-A. References Cited


IV-B. Additional Resources on Facilitating Interdisciplinary Research and Integration of Research and Curriculum at PUIs


PKAL Follow-up discussion: http://www.pkal.org/collections/Vol4InterdisciplinaryResearch.cfm

The Keck-PKAL Facilitating Interdisciplinary Learning Project

Keck/PKAL Leadership Guide for Facilitating Interdisciplinary Learning
http://www.aacu.org/pkal/interdisciplinarylearning/documents/KeckLeadershipGuide_SecIV.pdf (by
Mary Roth and Susan Elrod)

Facilitating Interdisciplinary Learning: Lessons from Project Kaleidoscope (by Adrianna Kezar and Susan
Elrod)  http://www.changemag.org/Archives/Back%20Issues/2012/January-
February%202012/Facilitating-learning-full.html

Transformative Research at Predominantly Undergraduate Institutions (CUR, 2010)
http://www.cur.org/assets/1/7/TRFull.pdf

Thinking Across Disciplines – Interdisciplinarity in Research and Education (DEA/FBE, 2008)
http://fuhu.dk/filer/FBE/Publikationer/thinking_across.pdf

Research and Discovery Across the Curriculum (by Susan Elrod, Diane Husic, and Jillian Kinzie; Peer
Review 12: Spring 2010)
http://www.aacu.org/peerreview/pr-sp10/pr-sp10_researchdiscovery.cfm

A New Biology for the 21st Century (National Academies Press, 2009)
http://www.nap.edu/catalog.php?record_id=12764

Vision and Change Final Report (NSF/AAAS, 2009)
http://visionandchange.org/finalreport
Appendix I.

Tuesday, June 5, 2012

6:00 pm – Welcome Dinner with the Co-PIs
CAV Restaurant, 14 Imperial Place, Providence RI 02903
http://cavrestaurant.com/wordpress/
Reservation for 8 under Sara MacSorley
Contact: Manager, Sylvia Moubayed

Guests:
1. Rieko Yajima
2. Gunalan Nadarajan
3. Jeff Osborn
4. Diana Husic
5. Jennifer Specker, University of Rhode Island
6. Ed Hawrot, Brown University
7. Charlie Cannon, Rhode Island School of Design
8. Mary Sullivan, Rhode Island College

Wednesday, June 6, 2012

8:30 am – Arrive at Community College of Rhode Island (CCRI)
400 East Avenue, Warwick RI 02886
Please park in the large lot to the left as you enter campus and approach the main building.
Meeting in Warwick Campus Board Room #4090

8:30 am – 9:00 am – Overview by Dr. Jennifer Specker
9:00 am – 11:00 am – CCRI Roundtable

Guests:
• Ray DiPasquale, President
• Lela Morgan, Vice President for Academic Affairs
• Robert Shea, Vice President for Business Affairs
• Dr. Peter Woodberry, Dean, Business, Science and Technology
• Timothy Pelletier, EPSCoR Outreach Coordinator
• Dr. Elizabeth Arendt, Chemistry
• Dr. Pranab Banerjee, Physics
• Jerry Bernardini, Engineering & Technology
• Dr. Alfred Craig, Chair Elect, Biology
• Edward Madonna, Mathematics
• Dr. Denise Yordy, Biology
• Robert Scott Warila, Assistant Professor, Biology
• David Vito, Assistant Professor, Biology
• Dr. Heather Townsend, Assistant Professor, Biology
• Jennifer Arruda, Alumni
• Adam G. Pepler, Alumni
• Jeremy A. Carreiro, Student

12:00 pm – 2:00 pm – Lunch with PUI Partner Liaisons
Cuban Revolution - http://thecubanrevolution.com/
60 Valley Street, Providence RI 02909

Guests:
• Mary Sullivan
• Dan McNally
• Peter Woodberry
• Sheila Adamus Liotta
• Eric Roberts
• Lonnie Guralnick
• John Dunnigan
• Lisa Zuccarelli

3:00 pm – 5:00 pm – Providence College (PC) Roundtable
1 Cunningham Square, Providence RI 02918
Meeting in Albertus Magnus Hall (Science Complex) – Enter campus at main gate on the corner of River Avenue and Eaton Street. Tell the guard you are going to Albertus Magnus Hall and they’ll direct you to the adjacent parking lot. The building is the first one on your right through the gate.

Guests:
• Sheila Adamus Liotta, EPSCoR Partner Liaison and Dean of the School of Arts & Science
• Kris Monahan, Director of Sponsored Projects
• Elisabeth Arévalo, Biology
• Maia Bailey, Biology
• Patrick Ewanchuk, Biology
• David Baier, Biology
• Jeffrey Markert, Biology
• Charles Toth, Chair, Biology
• Matthew DeBlois, SURF student with Markert
• Kelsey Garlick, SURF student with Markert
• Lauren Trotta, SURF student with Ewanchuk
• Natasha Zupkus, SURF student with Bailey
• Douglas Biancur, SURF student with Arévalo
• Richard Cimini, SURF student with Bailey
• Matthew Vumback, SURF student with Bailey

Dinner, Panel Only
Thursday, June 7, 2012

8:30 am – Arrive at Salve Regina University
100 Ochre Point Avenue, Newport RI 02840
8:30 am – 10:30 am – Salve Roundtable
ROOM

Guests:
• Sister Jane Gerety, RSM, Ph.D., President
• Dean de la Motte, Ph.D., Provost
• Laura O'Toole, Ph.D., Dean of Arts and Sciences
• William Hall, CFO
• Melissa Davis, Grants Officer
• Jameson Chace, Ph.D. Investigator
• Sarah Matarese, Ph.D. Investigator
• John-David Swanson, Ph.D. Investigator
• Lisa Zuccarelli, Ph.D., EPSCoR Partner Liaison

11:00 am – 1:00 pm – Roger Williams University (RWU) Roundtable
1 Old Ferry Road, Bristol RI 02809
Main Library Conference Room

Guests:
• President Farish
• Dr. Lonnie Guralnick, Dean of the Feinstein College of Arts & Science
• Dr. Roxanna Smolowitz, Assistant Professor of Marine Biology; Rhode Island NSF EPSCoR Research Team Leader (Q#3)
• Dr. Andrew Rhyne, Assistant Professor of Marine Biology; Research Scientist, New England Aquarium
• Polly Hutcheson, Executive Director of Grants and Contracts
• Cheryl Francis, Grant and Compliance Specialist
• Ellen Almeida, Controller

1:30 pm – 2:00 pm – Pizza & Salad Lunch at RWU for Panel and EPSCoR Staff
3:00 pm – 5:00 pm – Rhode Island School of Design (RISD) Roundtable
Waterman Building, Nature Lab Room 11A
13 Waterman Street, Providence RI

Guests:
• Charlie Cannon
• John Dunnigan
• Marta Gomez-Chiarri, Scientist in Residence
• Shawn Greenlee
• Kurt Ralske
• Nicole Merola
• Babette Allina
• Sarah Ganz Blythe
• Dennis Hlynsky
• Nick Jainschigg
• Bethany Johns
• Lindsay Kinkade
• Mikhail Mansion
• Laurie Mitchell
• Neal Overstrom
• Patti Phillips
• Chris Rose
• Clement Valla
• Damian White
• Patti Phillips
• Rosanne Somerson
• Jack Lovell
• Kyuha Shim
• David Zacher,

Dinner, Panel Only

Friday, June 8, 2012

8:30 am – Arrive at Rhode Island College (RIC)
600 Mount Pleasant Avenue, Providence RI 02908

8:30 am – 10:30 am – RIC Roundtable
STEM Center, Henry Barnard School Room 214

Guests:
• Breea Govenar
• Janis Hall (Masters student)
• Eric Hall
• Eric Roberts
• Sarah Knowlton
• Rebeka Merson (health permitting)
• John Williams (tentative)

11:00 am – 1:00 pm – Bryant University Roundtable
1150 Douglas Pike, Smithfield RI 02917
Please see guard at gate, they will direct you to the best parking lot.

Guests:
• Dan McNally
• Julie Crowley-Parmentier
• Chris Reid
• Students: Zoe White
• Amanda Smith
• Hunter O’Brien,
• Gaytha Langlois (Chair)
• David Lux (Dean)
• Jose'-Marie Griffiths (VP Academic Affairs)
• Budget: Pat Moody
• Wayne Jewett
• Adam Muccino

1:00 pm – 4:00 pm – Private Panel Session at Bryant (includes lunch)
4:00 pm – 5:00 pm – Debrief with Dr. Peter Alfonso and Dr. Jennifer Specker

Departure flights after 7:30 pm