#### Partnerships Working Group Executive Summary:

Membership:

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Judy Davie	SIU Carbondale	Connie Frey-Spurlock	SIU Edwardsville
Nancy Mundschenk	SIU Carbondale	Sharon Locke	SIU Edwardsville
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The SIU System Partnership Working Group (PWG) was constituted at the direction of SIU System President Dan Mahoney on January 31, 2020. Dr. Kinsel and Dr. Gupchup, co-Chairs of the PWG, met with Dr. Mahoney on February 21, 2020 to review the charge for the committee. Dr. Mahoney requested that the PWG 1) compile lists of active partnerships at the various SIU System institutions and 2) identify one, or more, complementary institutional partnerships where intrasystem-level coordination / promotion would benefit the partnership activities. Specifically, Dr. Mahoney asked the following to be included in the reports: 1) the current status of the institutional partnership, 2) the potential for growth, 3) the resources needed to achieve the envisioned growth, 4) the potential return-oninvestment which might be realized, and 5) a set of metrics that might be used to judge achievement of the envisioned goals several years out.

A template was developed by the PWG requesting descriptions of the existing partnerships at the various system institutions and the representatives from each institution took the lead on distributing the requests for input to the faculty at their respective campuses. The template asked for faculty responding to the request to specifically address the 5 points listed above. Over the course of the following several weeks "Partnerships" descriptions were submitted by faculty at SIU Carbondale and the School of Medicine and by faculty at SIU Edwardsville.

All members of the PWG were then asked to review the "Partnerships" reports submitted to identify overlapping areas of activity where intrasystem-level coordination / promotion would benefit the partnership activities. Committee members reviewed the collected "Partnerships" submissions individually and then met to assess which areas had the potential to benefit from intrasystem-level collaboration. The selection of a "Partnership" as fitting this criterion was based primarily on overlap of interests at the various SIU system schools and is not meant to suggest an assignment of lower importance to the unselected "Partnerships" – many of which enjoy solid foundations and significant growth potential at their respective institutions. Collectively the PWG identified 5 areas that met the criterion of potential benefit from intrasystem-level collaboration.

### Featured Partnership 1: Hemp / Cannabis Research and the Cannabis Science Center

Featured Partnership 2: Southern Illinois STEM Medicine Education (STEMMEd)

Featured Partnership 3: Increasing Community Impact and HIPs: An Intra-System Partnership to Support Successful Communities

Featured Partnership 4: Intra-SIU System Partnership: Cooperative SIUC-SIUE Ph.D. Programs

Featured Partnership 5: Partnership: The Center for Alzheimer's Disease and Related Disorders (CADRD) partnership with entities across Central and Southern Illinois

Following the selection of the 5 featured Partnerships faculty responsible for submission of the relevant Partnerships from the individual institutions were put in contact with each other and invited to update / elaborate the Partnerships description to encompass a system-level perspective.

The full descriptions of the Featured Partnerships may be found in Appendix 1 and the full descriptions of the non-featured Partnerships may be found in Appendix 2.

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# Featured Partnership 1: Hemp / Cannabis Research and the Cannabis Science Center:

# Background:

Recreational cannabis use was legalized in Illinois January 2020. The interest in developing retail business is strong in Illinois as is crop cultivation, and product quality and component analyses. As in all new endeavors all sectors are learning and exploring niches in products, services and supply chain. Research is instrumental in developing and evaluating new products and ideas. Similarly, the high fiber hemp plant which does not contain euphoric properties, is also gaining traction in the new marketplace. SIUC has already begun developing partnerships in the southern Illinois region and had numerous meetings with growers, processors, business, community and health leaders. This has led to the following campus collaborative developments on the research and academic fronts:

- 1. A request has been made to administration for the creation of the Southern Illinois Cannabis Science Center (SICSC) with membership from within and outside of the campus community. This center will be the hub of cannabis-related resources and activities for the region. For example, we envision working groups for agriculture, analytics, biomedical and community (healthcare, education, commercial interests) with one focus being to support the cannabis community through the development of projects with defined goals and funding streams. Resources will be sought through government grants, contracts for services provided, foundations or publicprivate partnerships. A SICSC website is also being created as a clearinghouse for hemp and cannabis information. A symposia/workshop was also scheduled but was cancelled due to the COVID-19 directive to avoid gatherings.
- Agriculture has created a one-year academic certificate program focused on training students for the intensively managed indoor crop production field. This program launches Fall 2020 and already has a \$100,000 diversity scholarship to support the program.

As individual faculty members, there has been substantial investments made to support the industry. For example, Dr. Gage is participating NIMSS S1084: Industrial Hemp Production, Processing, and Marketing in the U.S.

(https://www.nimss.org/projects/view/mrp/outline/17716) – SIU is one of the only 2 non-land grant institutions involved in this project. She has established our ability to circumnavigate the regulatory hurdles and grow a cannabis crop which was a dual-purpose variety trial planted at the Bellevile Research Center. Dr. Karen Jones has delayed plans (Due to COVID-19) for a beef cattle feeding trial of post extraction biomass with partner Aerosource. Dr. Anterola has had conversations with the Foundation of Cannabis Unified Standards (FOCUS) for using training materials to enhance online classes. Dr. Anterola and Dr. Kinsel are at various stages in developing analytical testing capabilities.

# **Opportunities for Growth:**

Our growth in the cannabis arena is tied with state and national policy. Transparent support of the industry is needed by our system office to nurture this new industry. Regionally, the cannabis industry's growth is dependent on the licenses issued by the State of Illinois. More business means more opportunity for SIU to serve and partner. Influence by the SIU president's office to streamline internal requests for authorizations, support business authorizations for down state and support internal SIUC offices that handle our regulatory compliance issues would be welcomed.

Public-private partnerships are being pursued. Feasibility of working with private entities to apply for rural development funding for a hemp processing facility in centrally-located Mt. Vernon, IL will be conducted (<u>https://www.rd.usda.gov/programs-services/biorefinery-renewable-chemical-and-biobased-product-manufacturing-assistance</u>). This facility would create jobs and encourage economic development in southern Illinois.

Campus indoor cultivation space and renovated greenhouse space would potentially lead to increased student enrollment and increased training opportunities for students entering cultivation industries.

As plant breeding catches up to this new industry, there will be greater demand for variety trials for fiber, dual-purpose, and CBD varieties to understand performance and yield across geographic gradients. Dr. Gage has already been in contact with several interested companies.

Dr. Karla Gage has discussed in length with National Corn to Ethanol research center of Southern Illinois University Edwardsville several research avenues. These projects include: **1. Convert hemp biomass to biofuel and bioproducts: NCERC's** business partner from industry has reached out to NCERC for help to develop an economic viable pathway to convert the leftover biomass from CBD oil extraction to biofuel and bioproducts. NCERC has years of experience in scaling up deconstruction of biomass to make ethanol, and with the addition of fermentation scientist Dr. Jie Dong (NCERC/SIUE Chemistry), we are capable to use genetically engineered microorganism to make drop-in fuel or polymer building chemicals out of hemp biomass. Dr. Gage will provide a variety of industrial hemp samples, and Drs. Altman and Asirvatha will provide techno-economic analysis (TEA) data to guide the industry to adapt the innovative pathway of conversion and lead to commercialization.

2. **Utilize industrial hemp seeds in aquaculture feed :** Aquaculture is the fastest growing food producing sector, and is essential to meet growing protein demand from future population. Hemp seeds have inherent advantages of protein and fat contents, which are highly complementary to the co-products from corn to ethanol production, distiller's dried grains with soluble (DDGS), when mixed together and used as aquaculture alternative feed ingredients. In the past, NCERC has successfully acquired funding for the collaboration with Dr. Kwasek on feeding DDGS to tilapia, and we are established to deliver more research using hemp seeds and DDGS as alternative aquaculture feed.

3. **100% hemp based blue jeans: t**raditionally, industrial hemp fiber has been used for making fabric. NCERC has developed a research plan with a lab from the US Department of Energy to make biobased blue dye utilizing genetically engineered microorganism to feed on carbohydrates from biomass hydrolysates (proposal pending). We are interested in collaborating with Dr. Gage to grow the best hemp specie for jean fabric, and use the biomass from CBD oil extraction to make blue dye. This research idea of making 100% hemp jeans has gained interest from a start-up company from UC Berkeley.

# **Potential for ROI**

The potential for developing the fledgling cannabis industry is promising for the future of SIU. New businesses are being approved through licensure administered by the IL Department of Agriculture. These businesses will be required to conduct independent product testing (fee for service) for which SIU could provide. In other research endeavors, SIU investigators routinely contract with outside facilities for many of the analyses that require more sophisticated instrumentation than is available on campus (ex. tandem mass spectroscopy) which diverts direct costs (\$\$) from extramural funding to other institutions. Collaborating with equipment manufacturers (ex. Shimadzu) is perhaps the most promising in terms of ROI. This partnership would allow our faculty and students to use subsidized equipment to test hemp, which can be offered as a service, while at the same time conduct research that will be of interest to other potential partners in the cannabis industry. Once established, the fee for service structure will become self-supporting.

Federal research funding is available through USDA NIFA, NSF and NIH. One specific proposal mechanism is the USDA competitive capacity building grants for non-land grant institutions. Congressman Bost has been a partner modifying the Farm Bill language to allow Carbondale to apply for this non-land grant funding mechanism.

Developing a poultry research facility would have a return on investment and support biomedical research—over the last 10 years the Hales have paid UIUC ~\$600,000 for use of their experimental poultry facility, instead of providing these funds to SIUC.

While too early to know for sure the impact the certificate program will have on enrollment, early interest in the program is high. Interest in the Horticulture B.S. has also been increasing due to new course offerings and construction of the new teaching greenhouse. Marketing of the programs and articulation agreements with community colleges would further enhance agriculture and science student enrollment.

NCERC is well connected with private industry in making biofuels and animal feed production. With sound TEA data for the R&D projects we proposed based on industrial hemp, we are confident we will attract industrial partners to invest and lead to commercialization, which is why NCERC was created in 2003, connecting R&D research with commercialization in biofuels and bioproducts

# **Timeline and Metrics:**

The Southern Illinois Cannabis Science Center will be the hub for cannabis-related research activities affiliated with SIU. While still in the early stages of formation, the overarching purpose will be to promote cannabis research. The Center's initial goals are to:

- 1. Form a collaborative network for cannabis research.
- 2. Establish specific projects with defined goals,
- 3. Identify funding streams to support these projects
- 4. Create working groups with common cannabis interests, ex., agricultural, analytical, biomedical, community (healthcare, educational, commercial)

We envision that SICSC will have a director with an advisory board structured with chairs of working groups. Advisory board members will be comprised of faculty and staff as well as external stakeholders. External members will be drawn from agriculture, business, health, retail, government policy or other cannabis-related backgrounds and have expressed interest in being advisory board members. Initially, the director will be tasked with representing SICSC, creation of content for marketing materials, organizing meetings, preparing guidance documents and annual reports.

Success of SICSC's goals will be measured by membership numbers, numbers of grants and projects funded, and research expenditures.

# **Required Investments:**

Resources would ensure the success of the SICSC initiative, enhance our academic programs and support this new industry.

- 1. Personnel
  - a. Quarter time release for a Director to administer SICSC plus summer salary.
  - b. Half-time administrative aid to assist in website development and workshop organization, report preparation and job/internship postings.
  - c. Graduate student assistantships (n=8, two per emphasis area; **two joint** SIUE/SIUC GAs with NCERC)
  - d. Faculty hires with cannabis expertise (Ag and Biological Sciences have submitted requests for TT hires in this area)
  - e. Staff support. Research II or III (n=2).
- 2. Space
  - a. Teaching greenhouse-in process
  - b. Overhaul/repair of the Calan Broadbent feeding system located at the Beef Evaluation Station. Estimate needed.
  - c. Poultry house (for biomedical research) \$600,000
- 3. Equipment
  - a. Fencing to secure growing sites (\$75,000-150,000)

- b. Field testing equipment for metabolites (https://www.orangephotonics.com/) \$13,000
- c. Industrial Hemp Analytical Testing Laboratory-Hemp growers benefit from testing to determine cannabinoid potencies, screening/quantitation of terpenes, pesticide/herbicide testing, mycotoxin detection, metals testing, and moisture content determination. The proposed analytical testing laboratory requires instrumentation (Estimate: \$700k). Details available upon request.

# Featured Partnership 2: Southern Illinois STEM Medicine Education (STEMMEd)

We propose to build an intra-system partnership to recruit talented students to SIU Science, Technology, Engineering, and Mathematics (STEM) and Medical professions, and to create faculty collaborations that support student participation and success in STEM and STEM Medicine. The new partnership, **STEM Medicine Education (STEMMEd)**, between the SIUE and SIUC STEM centers and the SIU School of Medicine's department of medical education will focus on securing external funding to grow and sustain this collaboration.

At the national level, there is a clarion call for an increase in college graduates in STEM programs to address the critical need in the industries that will be at the center of the continuing transformation of the world economy. STEM graduates and technical leaders are needed to solve our regional and national threats/concerns and to maintain global leadership in the ever-increasing technology-based economy. National reports indicate there is a real danger of the U.S. economy losing ground internationally unless our educational system becomes more effective at producing students interested in and capable of the rigors of the educational programs in the STEM disciplines. Employment prospects in STEM fields are high, and according to the National Association of Colleges and Employers (NACE) this trend will not soon end. Creating opportunities for more diverse participation and success in STEM education and careers in Medicine and other STEM fields among underrepresented groups of women, minorities, low economic status, and persons with disabilities is especially important. In addition, once students enter university-level STEM programs, they must be greeted with effective state-of-the-art STEM content and pedagogy to fully participate and benefit in these regional, national, and global challenges. These students also need financial, social, and academic support.

This challenge is central to the mission of all three partners, which individually have shown tremendous success toward achieving these aims. Thus, it is reasonable to propose this new partnership which unites three highly prolific STEM education agents will be "greater than the sum of the parts."

# Current State:

*SIUE STEM Center* - The SIUE STEM Center brings together practitioners and researchers from a broad range of disciplines to improve STEM understanding and achievement in K-12 and higher education, as well as advancing scientific research in select fields. The STEM Center serves SIUE faculty, staff, and students; regional schools and educators (e.g., parents, homeschool educators); community organizations; K-12 students, and researchers at universities across the U.S. (Table 1). Partners and funders include federal and state government agencies, business and industry, regional community colleges, and researchers and educators at other universities. Over the past nine years STEM center faculty and staff have partnered with 29 different SIUE units.

*SIU School of Medicine* - Southern Illinois University School of Medicine is a global leader in medical education, one of only two medical schools in the world with five AMEE ASPIRE

Awards, given by the world's largest organization for medical education. Problem-Based Learning and Simulated Patients - hallmarks of education in medicine across the world - were first developed by the faculty of the SIU School of Medicine (SOM). Also, historically, the SOM has placed special emphasis on diversity in the medical profession: the school's M.D. program is in the top 4 percentile nationally for the percentage of its graduating class who are African American; the school has developed key pipeline programs that if expanded could have a significant impact on the diversity of the medical profession in Illinois; and School of Medicine faculty are playing leading roles on the SIU system Diversity Advisory Council to strengthen diversity, equity, and inclusion in STEM and medicine.

Key to the STEMMEd partnership is the fact that SIU SOM has been a longtime innovator in premedical pipeline and preparatory programs focused on students underrepresented in medicine. These two efforts have had a great deal of success and would benefit and develop by this new collaboration.

The MEDPREP program based in Carbondale is a two-year post-baccalaureate program that has operated for 50 years. Current estimates suggest that one out of every forty African American medical students in the United States is a graduate of the SIU MEDPREP program.

The Physicians Pipeline Preparatory Program (P4) is a four-year after-school program serving high school students in the Springfield area. Freshman through senior year, students are immersed in experiences designed to resemble the experience of medical training. Each year P4 students take a standardized test developed for medical students - and by junior and senior years of high school, P4 students on average outscore one-out-of-five first-year medical students nationally, demonstrating that students can begin to learn the content of medical school well before they even attend college.

STEM Education Research Center at SIU Carbondale - The STEM Education Research Center (SERC), a research and public service unit of Science Technology, Engineering, and Mathematics (STEM), was created by Southern Illinois University at Carbondale (SIUC) with the approval of the Illinois Board of Higher Education on July 1, 2014. The SERC seeks to organize and sustain a community of university faculty and staff, educators and industry partners across the region, state and nation to collaboratively prepare the next generation of STEM educators, researchers and professionals. The SERC advances STEM literacy and addresses critical issues in STEM education at local, state and national levels through interdisciplinary and integrative strategies in research, education and service. The SERC supports existing programs and develops new funding initiatives to provide professional development for PreK-12 educators, advance research on STEM education, and enhance the undergraduate STEM experience. More broadly, SERC builds regional and state-wide collaborations with other universities and colleges to strategically advance STEM literacy and learning.

SERC programs include faculty, staff and students at SIUC; PreK-12 educators and students at regional schools and informal settings; other educators (e.g., parents, home educators); community centers and organizations; and researchers at SIUE, UIC, ISU, Lewis University,

University of Chicago, and several other universities across Illinois and beyond. Partners and funders include federal and state government agencies, business and industry, regional community colleges, and researchers and educators at other universities.

**Opportunities for Growth:** Opportunities for intra-system partnerships exist by connecting the SIUE and SIUC STEM education centers and the School of Medicine's medical education department. For example, the current interim director of the SIUC STEM Education Research Center is on the advisory board of the SIUE STEM Center. These two centers already have one successful collaborative project that involves faculty/staff from 7 universities and over 400 K-12 educators in Illinois to create and implement the next generation science assessment. However many more collaborations are possible and numerous funding opportunities exist to increase student enrollment, develop new academic programs, increase regional service and economic activity, and to increase research funding. The SIU School of Medicine has a highly productive education research group with a long tradition of exemplary educational leadership. Undoubtedly, the SIU system would benefit from increased interaction and collaboration among these units, as would our constituents and partners across our combined service regions.

**Potential for ROI:** The SIUE Center has received an average of \$1 million in grants and contracts annually over the past decade as principal or co-principal investigator. This is an average ROI of 250%. This ROI does not take into account the value that STEM Center projects have for increasing undergraduate student retention and graduation, securing new scholarship funding, and increasing the University's reputation with the goal of attracting students into STEM majors.

The SERC at SIUC is 100% externally funded and currently receives an average of \$2.6 million annually in grants and contracts. The substantial return on investment of the initial \$42K provided in 2014 to start the center is strong evidence that collaboration works and that significant funding opportunities for STEM education, service, and research are available.

The SIU School of Medicine is one of the most decorated medical schools in the United States for the quality of its educational programs. The School of Medicine is one of only two medical schools on earth to receive five ASPIRE Awards, lifetime achievement awards granted by the world's largest organization for medical education, the Association for Medical Education of Europe. In the United States, the School of Medicine is the first medical school ever to receive back-to-back maximum accreditations, with zero citations, from the Liaison Committee on Medical Education. As detailed above, the School of Medicine has also developed the P4 high school program in partnership with Springfield Public Schools and the Sangamon County Medical Society. The SOM has been approached by other college preparatory programs in the SIU system - notably the Upward Bound programs to serve students throughout the region. A STEMMEd partnership could provide the capacity needed to coordinate such efforts, and would increase the system's competitiveness for future federal investment in SIU college preparatory programs, all while furthering the School of Medicine's goals to diversify the medical profession in Illinois.

The potential ROI of the STEMMEd partnership will result in increased grants and contracts to support student and faculty success in STEM. Additionally, the increased availability of system-wide resources will be a force multiplier for professional development, training, resources, and support for university faculty, regional educators, and all of our students.

### **Timeline and Metrics:**

The following three objectives provide a framework for the new intra-system partnership in STEMMEd (STEM plus Medicine Education):

Goal 1. Build the collaboration infrastructure (Years 1-5)

- Recruit campus representatives Year 1
- Hire collaboration coordinator Years 1-5
- Hire grant writer Years 2-3

Goal 2. Develop faculty networks for new initiatives (Years 1-6)

- Select faculty fellows Years 1-3
- Recruit postdoctoral fellow Years 1-6
- Cross-institutional workshops offered 3 per year

Goal 3. Submit SIU system collaborative proposals to support students/faculty (begin Year 1)

- NSF Scholarship in STEM (S-STEM) Multi-Institutional Consortia up to \$5M for 5 years
- NSF Improving Undergraduate STEM Education (IUSE) up to \$3M for 5 years
- Other proposals to funding agencies: NIH, DOE, NASA, FEMA, ISBE, and IBHE

*Outcomes and Examples:* Campus representatives to the STEMMEd collaborative will be selected by Spring 2021 semester and will work with the collaborative coordinator to advance the goals. Three cross-institutional workshops will be offered per year with SIU system support to increase participation in the Collaborative. External proposals to sustain the Collaborative will be submitted beginning in Year 1 and continue thereafter. The grant writer hired in year two will support faculty and system-wide collaborations to obtain external funding.

In year one, immediate collaborative proposal development will seek to obtain approximately 300 scholarships (\$10K/year/student) for academically talented, financially needy, and underrepresented STEM majors through the NSF Scholarships in STEM (S-STEM) program. This external funding of up to \$5 million over five years will remove the financial barriers and create multiple opportunities for student success in STEM/Medicine, and provide research support for faculty to investigate, design, and implement academic programs to advance STEM learning, especially for underrepresented students. These externally funded initiatives will assist the collaborative to provide valuable experiences for students and our faculty to work with the Diversity Council to strengthen diversity, equity, and inclusion in STEM.

Another initial focus of the STEMMEd collaborative will be faculty professional development. For example, STEMMEd aims to increase innovations in online and blended learning, building on existing strengths such as SIUE's current National Science Foundation (NSF) funded initiative for flipped teaching to increase student persistence and success in STEM. SIUC STEM faculty are interested and have piloted this instruction design. Faculty Fellow support will establish an academic network across the SIU system and stimulate collaborative proposal development to obtain very large NSF IUSE undergraduate education funding for this project and others.

**Required Investments:** Initial investments include support for STEM Faculty Fellows at SIUE, SIUC, and SOM (three per institution @ \$10,000 each = \$90,000, Years 1-3) to ramp up faculty participation, grant proposal writing, and program development. A collaborative coordinator (\$60,000 annual salary, Years 1-5) will assist with communication, administration of collaborations and activities, and coordination of shared resources. A STEM education grant writer (\$60,000, Years 2-3) will provide the stimulus and support to advance education and research grant proposal activity and external funding to unprecedented levels. A rotating postdoctoral fellow (\$60,000 salary, Years 1-6) will provide expertise and support for innovative faculty research activities and proposal development.

*Sustainability:* Indirect cost recovery as well as direct costs from external funding will provide sustained support for the coordinator and grant writer after the startup funds are depleted. As mentioned previously, grant funding will provide support for faculty and students. The SERC at SIUC has already demonstrated this model of sustainability is possible.

# Featured Partnership 3: Increasing Community Impact and HIPs: An Intra-System Partnership to Support Successful Communities

**Introduction**: The <u>SIUE Successful Communities Collaborative</u>'s mission is to connect Illinois communities with SIUE students and faculty, and is preparing for its fourth partnership year, following partnerships with Highland, Godfrey, Alton, and Edwardsville. SSCC has connected approximately 250 students representing five SIUE colleges and schools to partner-initiated projects, giving those students the opportunity to apply knowledge and practice skills gained in the classroom to meaningful community projects that can lead to real outcomes. Based on the <u>EPIC model</u>, SSCC is a cross-disciplinary program that supports year-long partnerships between the University and communities in Illinois to advance local resilience and sustainability based on community-identified environmental, social, and economic issues. The model assumes a municipal partner but is flexible enough to work with other types of projects. SSCC, for example, has used the EPIC model to work with municipalities, county governments, not-for-profits, and grassroots organizations.

SIUE and SIUC will establish a joint EPIC program under the SSCC banner in year one. This extends the SIU system's reach and impact, providing access to much needed resources held by the University. SSCC staff and the SIUC team will partner to improve faculty and student support, tracking and assessment methods, and leverage one another's curriculum to more fully address community partner projects. Program leadership will work together to ensure continuous improvement. This partnership will create research opportunities around tracking and assessment data of student and community outcomes, as well as develop new individual-level relationships between faculty and staff at SIUC and SIUE. SSCC has leveraged several grants, ranging from state, federal, foundation, and internal sources to supplement program costs and to support partnerships with low income communities; these opportunities are expected to increase under the partnership. It is our hope that by connecting students to local communities in meaningful ways they will choose to live, work, and play in those communities post-graduation and that they will consider a career in the public sector.

Current stakeholders include: Connie Frey Spurlock, SSCC Director, Associate Professor of Sociology; Amy McMorrow Hunter, SIU AERC; Judy Davie, SIU School of Medicine; Nancy Mundschenk, SIU Teacher Education; Karen Schauwecker, SIU Sustainability Office; and the Center for Service-Learning and Volunteerism.

At a minimum, a .5 FTE staff person should serve as Program Manager for the SIUC EPIC program.

# **Background**

Based on the EPIC model, SSCC is a cross-disciplinary program that supports year-long partnerships between the University and communities in Illinois to advance local resilience and sustainability based on community-identified environmental, social, and economic issues. The EPIC model is different from typical one-off service learning or internship experiences because it is based on a year-long partnership and engages students from across disciplines around a single issue. For example, in SSCC's current partnership with Edwardsville, students from seven disciplines (CNST, ENSC, MC, SOC, MKTG, CS, and ANTH) contributed to an environmental-focused project. The impact on both the student and the partner is greater then, for students realize the role they play in the larger conversation both on campus and in the community, and connect with community leaders and residents in the process. It is our hope that by connecting students to local communities in meaningful ways they will choose to live, work, and play in those communities post-graduation and that they will consider a career in the public sector.

SSCC's mission is to connect Illinois communities with SIUE students and faculty, and is now preparing for its fourth partnership year, following partnerships with Highland, Godfrey, Alton, and Edwardsville. SSCC has connected approximately 250 students representing five SIUE colleges and schools to partner-initiated projects, giving those students the opportunity to apply knowledge and practice skills gained in the classroom to meaningful community projects that can lead to real outcomes. The model assumes a municipal partner but is flexible enough to work with other types of projects. SSCC, for example, has used the EPIC model to work with municipalities, county governments, not-for-profits, and grassroots organizations. (See SSCC's current and developing partnerships <u>here</u>.)

# **Opportunities for growth**

SIUE and SIUC will establish a joint EPIC program under the SSCC banner in year one. This would extend the SIU system's reach and impact further into Illinois, providing access to much needed resources held by the University. Beginning immediately, SSCC staff will provide training, mentorship, and technical support to the SIUC team. Also in year one, SSCC and SIUC staff will build out the SIUC EPIC program with the understanding that SSCC and SIUC will continue to partner into the future.

SSCC staff and the SIUC team will partner to improve faculty and student support, tracking and assessment methods, and leverage one another's curriculum to more fully address community partner projects. More generally, program leadership will work together to ensure continuous improvement. A partnership of this sort will create research opportunities around tracking and assessment data of student and community outcomes, as well as develop new individual-level relationships between faculty and staff at SIUC and SIUE.

# Potential ROI

Yet another way the EPIC model is different from other approaches is that the community partner contributes a nominal fee to help cover coordination and support from SSCC staff; student and faculty site visits; compilation, printing, and distribution of high-quality final

reports; publicity and hosting of events; student-created materials for display; coordination of contact with media; and electronic versions of coursework produced by students. Cost varies based on the number of projects, number of academic courses, and level of student activity in each course. SSCC partners have paid \$3,500-5,000 per project and have committed to a minimum of three projects. The fee does not, however, cover all costs. A fee structure, furthermore, prohibits low income communities from becoming a partner. Consequently, SSCC staff are actively engaged in grant writing and administration. As illustrated in the <u>SSCC diagram</u> in green, SSCC has leveraged several grants, ranging from state, federal, foundation, and internal sources to supplement program costs and to support partnerships with low income communities.

### **Timeline and metrics**

# Year 1, 2020:

July – Identify complete list of stakeholders. Current stakeholders include: Connie Frey Spurlock, SSCC Director, Associate Professor of Sociology; Amy McMorrow Hunter, SIU AERC; Judy Davie, SIU School of Medicine; Nancy Mundschenk, SIU Teacher Education; Karen Schauwecker, SIU Sustainability Office; and the Center for Service-Learning and Volunteerism.

August – Asset mapping. Deep dive into programming across both campuses.

September – October – Matchmaking (SSCC projects; SIUC and SIUE courses/assets)

With support from SSCC, SIUC begins search for pilot year partnership (Spring 2021)

November – December – With support from SSCC, SIUC identifies faculty for pilot year partnership.

Year 2, 2021:

January – May – With support from SSCC, SIUC carries out pilot year partnership.

June – August – SSCC & SIUC staff develop shared

- 1. vision and mission statement for SIU-EPIC program partnership;
- 2. communication plans,
- 3. assessment tools, and
- 4. annual reporting template.

Objective	Strategy	Key Performance Indicator
Demonstrate relationship between student involvement in SSCC/SIUC EPIC programs & university retention & graduation rates, particularly for under- represented students	<ul> <li>Work with SIUE C-PAN &amp; Institutional Research (IR) to develop evaluation &amp; reporting metrics</li> </ul>	<ul> <li>Retention rate of SSCC/SIUC EPIC program- engaged students</li> <li>Reduced DFW rate in high- risk courses</li> </ul>
Increase faculty research productivity across traditional & community- engaged research through the development of long- term collaborative partnerships with communities, businesses, & external organizations.	<ul> <li>Expand partnerships to small projects</li> <li>Increase the number of students &amp; faculty engaged with community partners</li> <li>Enhance research &amp; scholarly outcomes of SSCC/SIUC EPIC program projects</li> </ul>	<ul> <li># student research opportunities generated (undergrad &amp; graduate),</li> <li>Increased capacity &amp; enhanced infrastructure for future grants</li> <li>Professional service opportunities for faculty &amp; students with external partners beyond the classroom</li> </ul>
Utilize SSCC/SIUC EPIC program's community- engagement & high impact community engagement practices (HICEPS) model as a recruitment & branding resource for the University	<ul> <li>Develop events &amp; integrated marketing strategies to promote successful SSCC project &amp; student outcomes</li> <li>Explore alignment of SSCC/SIUC EPIC Program with Carnegie Community Engagement classification</li> </ul>	<ul> <li># students recruited due to SSCC opportunities</li> <li>Development of Carnegie Community Engagement classification report, &amp; potentially, application for Carnegie status in 2029 (SIUE)</li> </ul>

Table 2 – SSCC Expansion Key Performance Indicators

Non-traditional credentialing (digital badges & prior learning)	- Engage with Student Affairs, Academic Advising, Kimmel Leadership Center, & Center for Service-Learning & Volunteerism to identify & refine opportunities for credentialing & co-curricular transcripts	<ul> <li># of alternative credentials developed</li> <li># of students engaged in alternative credentialing opportunities</li> <li>Professional &amp; academic outcomes of students receiving alternative credentials</li> </ul>
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# **Required Investments**

At a minimum, a .5 FTE staff person should serve as Program Manager for the SIUC EPIC program.

# Featured Partnership 4: Intra-SIU System Partnership: Cooperative SIUC-SIUE Ph.D. Programs

### **Background:**

Southern Illinois University Carbondale (SIUC) and Southern Illinois University Edwardsville (SIUE) currently have five collaborative Ph.D. programs available: **Computer Science**, **Engineering Science**, **Environmental Resources & Policy**, **Historical Studies**, and **Pharmacology & Neuroscience**.

**Computer Science (CS)**. The Computer Science program provides students with the theory, tools and techniques by which information is derived, stored, manipulated, and communicated using computers, dealing particularly with the study of algorithms that are used to direct the computer and with the expression of these algorithms as programs. Students learn to effectively apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems; effectively use state-of-the-art techniques and computing tools for analysis, design, and implementation of computing systems; demonstrate significant contribution to the field of computer science through their research and applications of their research; and communicate their knowledge effectively to both technical and non-technical audiences. Most courses are offered face-to-face, but some are offered online.

**Engineering Science (ES).** The mission of the Engineering Science program is accomplished by recruiting, enrolling, and graduating doctoral-level engineers with strong basic science, engineering, and mathematical backgrounds who can adapt to interdisciplinary research and emerging areas of technology. This program provides a central knowledge base for certain emerging technologies. The program's curriculum allows for flexibility for students to focus on their area of dissertation from one of the following: Civil & Environmental Engineering; Electrical & Computer Engineering; Industrial & Quality Engineering; Mechanical Engineering & Energy Processes. Courses are primarily taught face-to-face with lecture and lab sections, although some courses are offered online as well.

**Environmental Resources and Policy (ERP)**. The Environmental Resources and Policy (ERP) Ph.D. program within the Department of Environmental Sciences focuses on advanced interdisciplinary training and research on physical, biological, and social processes responsible for natural resource and environmental problems facing contemporary society. ERP is designed to bridge the gap between the environmental and the social sciences with a focus on

environmental policy and the management of natural, water, and land-based resources. ERP has a methodological emphasis on data science tools (e.g., GIS, data analysis, machine learning and statistical methods). Through faculty mentoring, the ERP program prepares students to work with multifaceted environmental issues and enables them to carry out interdisciplinary research. ERP graduates are qualified for higher-level administrative positions in government, the private sector (both for-profit companies and nongovernmental organizations) and an evolving niche within academia for interdisciplinary scientists who are focused on issues related to sustainability. Most courses are taught face-to-face.

The cooperative ERP Ph.D. program in SIUE's College of Arts and Sciences features the following concentrations:

- Agricultural and Rural Land Resources
- Earth and Environmental Processes
- Ecology
- Environmental Modeling
- Environmental Policy and Administration
- Geographic Information System
- Water Resources

**History Studies (HS).** The Historical Studies program provides rigorous training in the content and competencies needed for effective research into the human past and its influences on the present. Our students learn to collect and interpret evidence, construct historical arguments, and communicate their insights through both written and oral expression. Students learn to be "scholar-citizens" who are capable of thinking critically about their present through a critical reflection about their past and produce original works of historical criticism; "scholars of history" who can engage critically with historiographic literature and conduct original historical research; "journeymen in history" who have expert mastery of particular areas of historical scholarship; and "teachers of history" who can develop and teach courses grounded in current historical knowledge and sound pedagogy. Courses are offered face-to-face, online, and also via Zoom (between the two campuses in Carbondale and Edwardsville).

**Pharmacology & Neuroscience (P&N).** To expand the educational opportunities of students enrolled in the Southern Illinois University (SIU) System by making available the widest possible variety of graduate curricular offerings while minimizing Institutional costs, the Graduate School at SIU Carbondale (SIUC), working with the School of Medicine and other academic units, and the Graduate School (SIUE), working with the School of Pharmacy, agree on the participation of SIUE students in the SIUC doctoral program in Pharmacology and Neuroscience.

# **Opportunities for Growth**

**Computer Science.** Since SIUE does not offer an independent Ph.D. degree in CS for its student population, the cooperative SIUC-SIUE program serves the needs of students living near Edwardsville and St. Louis metropolitan area who are interested in earning a Ph.D. degree in CS.

**Engineering Science.** Essentially, the cooperative ES program will increase the number of doctoral-level engineers in interdisciplinary areas within science and technology. It provides expanded research opportunities and knowledge to students in engineering sciences, including materials development, energy processes, coal sciences, and other technologies that are critical to the economic health of the state and nation. With the Ph.D. students being encouraged to seek out individuals within industry in the southern Illinois or neighboring regions as sources for their research, it allows both the students and the university to maintain connections within the region in a business capacity. Additionally, this provides students with invaluable contacts for post-degree employment with regional or state-wide companies, further bolstering the university's reputation within the state as well as supplying a workforce for the region and state.

**Environmental Resources and Policy (ERP).** The focus of the ERP program on providing students with the tools and knowledge base to become sustainable leaders in the public or private sectors aligns well with SIU mission to be a public research university that strives to shape future leaders, improve our communities, and transform lives. ERP is a highly interdisciplinary field addressing critical environmental challenges such as provision of clean water, pollution reduction, mitigation and adaptation to climate change, and research and development for new technologies and processes to minimize degradation of natural resources. ERP fills a niche in a higher education landscape by cross-training students in the social, biological, and physical sciences to carry out policy relevant interdisciplinary scientific research, which is in demand by for-profit companies, nongovernmental organizations, local to international governmental bodies, and academia. Workers with skills developed in this degree program, such as expertise in drones and geospatial analysis, are in high demand. As such, it is

an area of investment by governments and the private sector and generates strong interest among students. Other potential partners for an SIUE intra-system partnership include the Environmental Resource Training Center (ERTC) in Edwardsville and public health researchers in the SIU School of Medicine. A research cluster in this area would attract students and external funding.

**Historical Studies (HS).** The cooperative Ph.D. program in HS offers doctoral training to students in the region and the world. The Edwardsville location reaches students who are working in the Metro East area. The HS graduates find jobs in institutions of higher education (including state and regional community colleges), government, business, and nonprofits.

Pharmacology & Neuroscience (P&N). The SIUE School of Pharmacy (SOP) has a successful research program and MS degree in Pharmaceutical Sciences (including Pharmacology Track). The SOP has collaborated on several research projects with the SIU SOM and has Clinical faculty housed at the SIU SOM. An established relationship has already been built. This program will help increase funding and grant submissions through close collaboration between the faculty and doctoral students at SIUE SOP and SIU SOM.

Computer Science (CS)	× •	5 <sup>th</sup> Year
	Year One (Currently)	(or when full implemented
Number of Program Majors (Fall Headcount)	2	5
Annual Number of Degrees Awarded	0	1

# STUDENT ENROLLMENT AND DEGREE PROJECTIONS

	Year One (Currently)	(or when fully implemented)
Number of Program Majors (Fall Headcount)	2	5
Annual Number of Degrees Awarded	0	1
Engineering Science (ES)	Year One (Currently)	5 <sup>th</sup> Year (or when fully implemented)
Number of Program Majors (Fall Headcount)	14	15
Annual Number of Degrees Awarded	2	3

Environmental Resources and Policy (ERP)	Year One (Currently)	5 <sup>th</sup> Year (or when fully implemented)
Number of Program Majors (Fall Headcount)	2	5
Annual Number of Degrees Awarded	0	1
Historical Studies (HS)	Year One (Currently)	5 <sup>th</sup> Year (or when fully implemented)
Number of Program Majors (Fall Headcount)	8	14
Annual Number of Degrees Awarded	0	2
Pharmacology & Neuroscience (P&N)	Year One (Currently)	5th Year (or when fully implemented)
Number of Program Majors (Fall Headcount)	0	10*
Annual Number of Degrees Awarded	0	2*

Note: \* Estimates

# Potential for ROI:

- Build Ph.D. enrollment for the respective programs.
- Foster and strengthen collaboration for faculty and Ph.D. students on two SIU campuses for increased research funding and submissions of collaborative grant proposals.
- Secure contracts with industry that will generate additional revenue streams for the University.

# **Timeline and Metrics:**

The Cooperative Ph.D. Programs in Computer Science, Engineering Science, Environmental Resources & Policy, and Historical Studies have been offered for years. The curricula of these four programs have been constantly strengthened through collectively efforts of the faculty at both campuses.

The Pharmacology & & Neuroscience Cooperative Ph.D. Program has been in discussion by the SIUE SOP, SIU SOM, SIUC Graduate School, and SIUE Graduate School for about 3 years. IBHE has recently approved the "out-of-region" RME to facilitate this program. The P&N cooperative program will be offered starting Fall 2021.

Appropriate metrics include successful building of curricula, doctoral student enrollment, retention rate, number of graduates, publications, grant submissions and awards, and contracts.

# **Required Investments:**

CS, ES, and HS: The personnel resources that are needed to provide quality cooperative Ph.D. programs are already in place in the respective programs at both SIUC and SIUE. Virtually no additional faculty, staff, or administrators need to be hired. The facilities and equipment that are needed to meet the academic needs for these three cooperative Ph.D. programs are already in use at both SIUC and SIUE. No new facilities or equipment are needed. That being said, these programs may be in need of additional faculty lines and doctoral student assistantships to attract students who can support faculty research advances, as well as resources to support cross-fertilization of ideas between SIUC and SIUE, such as stipends for faculty exchanges and funding for an annual symposia.

ERP: A faculty cluster hire (3-4 lines) is needed to jump start research in the ERP program.

P&N: \$100,000 for equipment, staffing, and graduate assistant stipends.

Both Graduate Schools (at SIUC and SIUE) will provide financial and administrative support for academic and research interactions between the faculty and students on two campuses, including annual conferences or meetings and periodic individual program meetings. Further, senior administrators (e.g. deans, provosts or vice chancellors) will provide specific help and facilitation to the faculty members of two campuses to pursue external resources (e.g., grant-writing, fundraising) to sustain the growth of Pharmacology and Neuroscience program.

**Partnership:** The Center for Alzheimer's Disease and Related Disorders (CADRD) partnership with entities across Central and Southern Illinois

Background: CADRD is a state funded Center that is housed in the Department of Neurology on the Springfield campus of SIU Medicine. We have several areas of ongoing and potential collaboration, all with the possibility of exponential growth. After an extensive search, CADRD recently named a new director, Erin R. Hascup, PhD, who began on January 1, 2020. One of her major long term goals is for CADRD to become a federally funded and internationally recognized Alzheimer's Center. To accomplish this, Dr. Hascup and the CADRD team plan to revamp CADRD with a research focus aligned with National Institutes of Health (NIH) goals (https://www.nia.nih.gov/research/milestones) embedded in each of its three pillars of Clinical Health, Analytical Neuroscience, and Community Engagement to give our patients, caregivers, and community a CHANCE at improved outcomes. There are currently no federally funded Alzheimer's Centers (https://www.nia.nih.gov/health/alzheimers-disease-research-centers) with a primary focus on the rural community. Due to the locations of our three SIU campuses and satellite provider locations, and CADRD's rebuilding Memory and Aging Network, we are uniquely poised with the opportunity to become the leading experts in evidence-based Alzheimer's care in a rural setting. However, at the current time this proposed partnership is in its infancy. We have yet to reach out to our sister campuses and additional satellite sites and our Memory and Aging Network was once well above 30 provider sites that served most of Illinois outside of the Chicago area, but due to circumstances outside of our control (state budget impasse, etc.) we only have ~6-8 active sites.

**Opportunities for Growth:** It is anticipated that if these partnerships are supported at the system level we would have increased collaborative efforts and continuity between the campuses, expanded our competitiveness and capabilities of securing external funding through grants, philanthropy, and public-private collaborations (increased clinical trials with pharmaceutic companies aimed to combat Alzheimer's disease by offering a centralized means of access to an understudied and currently mostly inaccessible patient population as well as with entities interested in non-pharmacological interventions, such as the YMCA, art associations, assisted living communities, etc.). Together, this would also increase student enrollment in academic programs through increased awareness and opportunity, as well as increase economic activity in the form of jobs created and the possibility off caregivers to be able to return to the workforce.

**Potential for ROI:** We are actively seeking out the potential for grant funding in all aspects of our program. One grant that will specifically help to build CADRD and help to position it for successfully competing for a spot as a federally funded Alzheimer's Center has been identified and we will plan to put an application in June (https://grants.nih.gov/grants/guide/rfa-files/RFA-AG-21-007.html). This grant would not only help to build the CADRD, but would also contribute to training and educating the next generation of age-related disorders clinician-scientist. Research faculty have also identified grants that they can apply for which would bring dollars to the institution, increase student education, and create additional jobs. We receive awards from the King's Daughter's Organization to help support some of our Beyond the Medical Center Programs, which with continued success and impact, will likely continue into the future and there may be additional organizations that would like to contribute. We also have a partnership with the Springfield Art Association that helps with one of our art programs – there is a potential here for some

philanthropic efforts associated with the art shows. If successful, these partnerships would also offer the availability of clinical trial participation, non-pharmacological interventions, and caregiver education to communities in central and southern Illinois that currently have limited access to these opportunities. Additionally, by partnering with someone such as Dr. Ken Witt's group at SIU-E (this partnership has not been established yet), we may be able utilize our patient population to initiate clinical trials with pharmaceutical interventions that have been designed and validated by Witt's group at SIU-E, producing both additional dollars for the system as well as being able to offer the people of central and southern Illinois another novel therapeutic with the potential to change disease progression. Additionally, by redirecting CADRD and its partnerships towards research, the programs and the system will gain public recognition, help with branding, recruitment and retention of students and faculty, and increase philanthropy. The biospecimen bank also offers an opportunity for RIO as not only SIU researchers could use these biospecimens for research and be more competitive for external grants, but the biospecimens could also be made available for purchase by researchers external to the SIU system.

	Year				
Deliverables	<u>0-1</u>	<u>1-5</u>	<u>5-9</u>	<u>10+</u>	Metrics
Refine/Refocus Research Directives for Clinical Health (Patient Care including Clinical Research)					Set up Biospecimen Bank (Assistance from Kathy Robinson - Simmons Cancer Institute, and Amber Fifer - Center for Clinical Research). Establish REDCap database to coordinate patient care and clinical research efforts. Establish protocols for new and follow up patient visits to include consenting for research, obtaining biospecimens, obtaining cognitive testing. Improved patient outcomes.
Biospecimen Bank					Increased sample collection numbers, diverse participants locations, participants, and requests for samples within the organization/partnerships and external
REDCap Database					Determine parameters to be included and design database (year 0-1). Increased data entered, IRB applications to use data for research purposes, manuscripts published, presentations given, etc. (all other years).
Enhance Research for Analytical Neuroscience (Basic/Translational Research)					Additional faculty hired, number of grants applied for and received, dollars back to thesystem in terms of indirects) manuscripts published, presentations given, translation of research to the clinic, use of biospecimen bank for research purposes, etc.
Refine/Refocus Research Directives for Community Engagement (Beyond the Medical Center Programs, such as Minds in Motion, etc.)					number of participants enrolled, faculty/staff hired, additional locations implemented, improved patient and caregiver outcomes.
Expansion of Community Engagement to Central and Southern Illinois					number of participants enrolled, faculty/staff hired, additional locations implemented, grants funded, manuscripts published, changes to programs based on evidence from our research, improved patient and caregiver outcomes.
Enhance Public knowledge/Brand					Increased philanthropy, selection for clinical trials, invited speaking engagements, internet searches, website hits, patient -
Enhance Philanthropy					dollars into system to support CADRD and their partners.

### **Timelines and Metrics:**

**Required Investments:** Investments that would facilitate these partnerships and their potential ROI include support for staff to help in coordination between the various sites, help to consent patients and

obtain and store/ship biospecimens from remote sites (or provide a mobile biospecimen lab possibly similar to the blood donation trucks), dedicated philanthropy and marketing staff, protected time for research for faculty, additional staff trained in cognitive testing, additional equipment, such as -80 freezers for sample storage, etc. We would also need additional faculty hires to support increased research within each of the three pillars (both in Springfield and at other locations) as well as staff to support the endeavors.

# SIUC / SIU SoM Partnerships:

# Partnership 1: Fermentation Science Institute

### **Ravinia Brewing Company**

### Background:

The FSI has developed a relationship with Ravinia Brewing Company, a relatively new and growing craft brewery based in Chicago. The partnership has evolved into two separate but related opportunities, (1) placement of a large, commercial production facility on campus and (2) placement of a smaller 4-barrel brewery for use by the Fermentation Science Institute as a campus brewery. The projects primarily involve and affect the Fermentation Science Institute, the fermentation science degree program and the faculty associates of the institute. We anticipate additional involvement from the Colleges of Science, Agriculture, Engineering and Business. Importantly, Ravinia has expressed an interest in building additional relationships with units in other areas, such as marketing.

*Commercial Production Facility*. The Institute issued a formal Request for Information (RFI) for a brewery to place a production scale brewing facility within the McLaffery Annex with the explicit purpose of partnering with the FSI to provide educational and research opportunities for the students and faculty. Ravinia Brewing Company was chosen in the process

(<u>https://news.siu.edu/2018/06/062718-plans-for-fermentation-science-institute.php</u>) and former Chancellor Montemagno put his support behind the project in 2018

(https://blog.chancellor.siu.edu/teaching-the-science-of-brewing/). Unfortunately, the project later stalled when the central administration was unable to identify local funds to support buildout of the required infrastructure. In December of 2018 an infrastructure plan led by the Fermentation Science Institute and the Research Park was chosen as the campus submission to become a hub in the Illinois Innovation Network (IIN), as a shovel ready project. Significant effort and internal resources have been expended and 33% complete architectural/engineering plans have been developed. Additional partnerships have been identified and equipment donations/grants have been secured. Funds for the IIN (includes the iFERM Hub) were appropriated in the state budget and the Governor recently announced release of funds to move forward. The university signed a Letter of Intent with Ravinia Brewing in August of 2019 (see attached) and they have committed to place and operate the commercial brewery as soon as possible as the project moves forward.

*4-barrel Brewery.* Ravinia has also offered to place a new 4-barrel brewhouse in the Fermentation Science Institute for our use. The details of the arrangement are still under development, but the objective is for the FSI to operate the brewery under Ravinia's brewers license. This resource will provide valuable training and research opportunities for our students, as well as serve as a cornerstone for workforce education opportunities of the iFERM Hub. While licensing and various approvals are needed, a primary objective of the facility will be to operate as a pilot scale, student involved brewery for commercial manufacture of a campus produce product.

### **Opportunities for Growth:**

This partnership represents an opportunity to strongly establish our brewing science program as a leader on the world stage. Already one of only 7 programs recognized by the Master Brewers Association of the Americas, SIU will be unique in having vertically integrated pilot and instructional facilities, which includes the university farm, the USDA supported malting facility, pilot breweries at ½ barrel and 4 barrel capacities, tied with the large production facility, all under the same roof. With proper support from the university, this can become a resource for training students, both degree seeking students and workforce education. It can also become a tool for research in multiple disciplines and could lead to increased funding opportunities in multiple areas.

### Potential for ROI:

The return on investment is clear and significant for this partnership.

- Monetary Returns
  - Lease at market value with proceeds earmarked to support the program. Details of the lease are still to be finalized but should generate revenue on the order of \$30-40K annually. Additional co-branding opportunities exist, as well as the ability to produce an SIU branded beer under their license.
  - Possible licensing revenue from SIU branding.
  - The 4-barrel brewery could easily generate \$50-100k in revenue while operating as a student training and research tool.
  - Partial funding for joint staff position
- Enabled Activities
  - Access to production scale equipment for educational purposes
  - o Internship and student work opportunities
  - Research opportunities involving production scale brewing operations
  - World class brewing education infrastructure will improve student recruitment and retention
  - SIU branded products can be distributed into key markets to improve brand awareness and loyalty amongst alumni

### Timeline and Metrics:

- RFI and commitment from Ravinia (complete)
- Letter of Intent (complete)
- Operation of 4-barrel Brewery (3-6 months)
  - Process is ongoing to provide a temporary placement of the 4-barrel system
    - Pending final planning and quote from Physical Plant Operations to provide necessary utilities
- Finalize plans and coordinate with Capital Development Board for placement of production brewery as part of iFERM Hub (1-4 months)

- Installation and commissioning of brewery (12-18 months)
- Co-branding and production of branded and/or collaborative products (2 months)
- Project success can be measured by direct revenue received, growth in the number of students educated and improved awareness of SIU at the national level

### **Required Investments:**

- 4-barrel brewery will require infrastructure buildout, installation and commissioning. It is being co-located with the pilot distillery, thus some of the cost will be shared with the distillery project supported by a USDA/DRA grant (\$40K). Additional internal funds (including match for grant) have been identified and earmarked for the project, though the complete cost of the project is still undetermined.
- There is an intent to hire a jointly funded position that will serve as head of brewing operation in the production facility and serve in an instructional capacity in the FSI. Funding for the university portion of this salary will need to be sourced.
- The primary cost of implementing the partnership is renovation of Phase 1 of the iFERM Hub in McLafferty, which is expected to be provided by the IIN.

### **Anheuser-Busch InBev**

### **Background:**

The Fermentation Science Institute has been working toward a partnership with Anheuser-Busch InBev (AB-InBev) since the inception of the Institute. The first Technical Director (Technical Center for North American Operations) was an advisor in the development of our program. He has since retired, and we have continued a strong relationship with the current director. They have indicated they want a university relationship to be deeper than philanthropy and see our program in alignment with their philosophy on brewing education. We first facilitated a site visit at their facility in St Louis with campus leadership (President/Chancellor, Provost, Vice Chancellor for Research, Deans and FSI Director) and in 2019 hosted a visit at SIU. We have begun discussions on how a formal partnership could begin and we have executed a non-disclosure agreement they requested to allow free discussions as we move forward.

### **Opportunities for Growth:**

We believe a key aspect of optimizing the potential for this partnership will involve continuing to establish our programs by adhering to best practices in the industry and ensuring our educational programs, research and service offerings serve both students and the industry well. Given the global stature of AB-InBev and the proximity of their North American headquarters, the opportunity for growth is significant. It is also notable they have a long-term interest in developing relationships with other programs on campus, following success with fermentation science. AB-InBev is a vertically integrated global company, hence opportunities would exist in nearly every college.

### **Potential for ROI:**

Return will be in the form of supported research contracts carrying out R&D projects, recruiting and retention benefits from establishing a visible relationship, student placements (internships and long-term) and eventually in the form of endowments or other gifts. The capacity for significant gifting is real, but they have been clear of the desire to first build a relationship with a record of productive activities before approaching their foundation.

A visible partnership with AB-InBev would be a boon to recruiting efforts as we build the program. Given the specialized nature of our degree program we recruit nationally and the recognition from such a partnership will not only help to build national recognition for the fermentation science program, but for SIU in general. Thus, the return from tuition revenue will be significant.

### Timeline and Metrics:

- Begin formal Discussions (ongoing)
- Develop formal internship agreement (ongoing)
- Begin R&D projects (2-12 months)
- Formalize partnership with defined benefits (12-24 months)
- Project success can be measured by growth in the number of students educated and the number of majors in the program, revenue received from sponsored research projects and charitable donations, and improved awareness of SIU at the national level

### **Required Investments:**

- Completion of Phase Zero project, especially distillery operations
- Completion of iFERM Hub
- Continued growth and support of fermentation science program
- Hire adequate faculty and staff to support the iFERM Hub and degree program
  - 2-5 new faculty will be needed over the next 2-4 years. Can be a mix of tenure track and non-tenure track/professor of practice with potential for joint appointments in other schools.

# **Pall Corporation**

### Background:

Pall Corporation is a U.S. based billion-dollar company that focuses on filtration, separation and purification products. They have a beverage division and have develop PCR technology for screening samples for spoilers (yeast and bacteria). Following an introduction at a trade show, I invited their Food & Beverage Manager to visit our program and tour the Fermentation Science Institute. This resulted in an informal partnership where they placed one of their PCR instruments in the Service Lab of the FSI to support testing operations in the region and funneled business to us for any businesses that did not buy

their own unit. This grew into a significant source of income for the Institute. We have had the system in operation since fall of 2016. We want to build on the partnership, making it a formal and visible partnership with defined benefits. We also think there is significant opportunity to benefit other units on campus due to the multiple sectors in which Pall has activity. We have recently conveyed our interest in formalizing and expanding the partnership and the interest was reciprocated.

### **Opportunities for Growth:**

It is early in discussion, but we believe there is opportunity to build a partnership that supports interested areas in food, beverage and biotechnology. A recent example of a Pall partnership is the University College London-Pall Biotech Centre of Excellence for research and training established in 2018. <a href="https://biotech.pall.com/en/press-release/2018-ucl-centre-of-excellence.html">https://biotech.pall.com/en/press-release/2018-ucl-centre-of-excellence.html</a>

### **Potential for ROI:**

Simply formalizing and making visible the existing partnership would be of benefit from a promotional and recruiting perspective. It also follows that a further developed partnership could build a pipeline of graduates from SIU programs, as well as internship opportunities. If a topic develops of appropriate interest to justify an joint initiative, contributions on the order of \$1-3M would be in line with contributions disclosed in other Pall partnerships.

### Timeline and Metrics:

- Begin formal Discussions (ongoing 6 months)
- Formalize partnership with defined benefits (6-12months)
- Project success can be measured by growth by the degree of engagement, the visibility of the partnership and the ancillary benefits thereof

### **Required Investments:**

- Continued growth and support of fermentation science program
- Hire adequate faculty and staff to support the iFERM Hub and degree program
  - 2-5 new faculty will be needed over the next 2-4 years. Can be a mix of tenure track and non-tenure track/professor of practice with potential for joint appointments in other schools.

### **Baetjie Farms**

### Background:

The basic infrastructure provided by the Innovative Food and Value-Added Agriculture Facility of the iFERM Hub enables efficient placement of cheese production facilities. The proposed Fermented Dairy Facility allows the establishment of a cheese program that serves the educational needs of the fermentation science program, but will also serve an outreach

component helping to further establish cheese operations as valued-added agricultural products in the state and region. Baetjie Farms is a renowned award-winning artisan cheese producer located just across the river in St. Genevieve MO. Our discussions are in the beginning stages, but they have confirmed interest in discussing a partnership with the Fermentation Science Institute and agreed to support our proposal for the iFERM Hub.

### **Opportunities for Growth:**

Fermented foods and dairy represent a significant area for growth. Our programmatic materials and infrastructure have focused on beverage production in the first years of the program, but fermented foods are a key part of the program and the infrastructure afforded by the iFERM Hub. A partnership with a respected cheesemaker will enable us to grow the food side of the program significantly.

### Potential for ROI:

The return on investment is clear and significant for this partnership.

- Monetary Returns
  - Revenue from commercial sales from a campus cheese program.
  - Possible licensing revenue from SIU branding.
  - Revenue from workshops and training programs
- Enabled Activities
  - Access to production equipment for educational purposes
  - Research opportunities involving production operations
  - Establishing a solid reputation for the cheese program will improve student recruitment and retention
  - SIU branded products can be distributed into key markets to improve brand awareness and loyalty amongst alumni

### **Timeline and Metrics:**

- Continue informal discussions (2 12 months)
- Formalize partnership with defined benefits (6-12months)
- Success can be measured by direct revenue from product sales, improved reputation of the program, increased recruitment and retention numbers.

### **Required Investments:**

- Completion of Phase Zero project, especially distillery operations
- Completion of iFERM Hub
- Continued growth and support of fermentation science program
- Hire adequate faculty and staff to support the iFERM Hub and degree program
  - 2-5 new faculty will be needed over the next 2-4 years. Can be a mix of tenure track and non-tenure track/professor of practice with potential for joint appointments in other schools.

### AbbVie Inc.

### Background:

AbbVie is a biopharmaceutical company founded in 2013 as a spin-off from Abbott Laboratories. Their fermentation division is based in North Chicago. We had some initial discussions and a site visit in 2015 as we were establishing the degree program. Historically they have filled their workforce by hiring chemical engineers and/or microbiologist and then training them in an in-house training program on fermentation. They expressed intrigue with the idea of a degree in fermentation science as an additional career pathway. We expressed an interest in involving them as we build out the pharma aspects of the program.

### **Opportunities for Growth:**

Pharmaceutical fermentation represents great area for growth in the program. While the fermentation science degree program is designed to prepare students for careers industrial and pharmaceutical fermentation, we do not currently have the infrastructure to provide advanced and laboratory courses in these areas. Were we to establish a partnership with AbbVie it would bring immediate benefits and enable development of specializations in industrial and pharmaceutical fermentation in the degree program.

### **Potential for ROI:**

Based on the size of this Illinois based company, we believe that a significant endowment could be possible should AbbVie choose to partner with the university. Gifts-in-kind of equipment are also possible. As we move to build out our industrial fermentation and biotech laboratories in McLafferty, this represents a naming opportunity for a laboratory that could serve teaching and research needs.

### **Timeline and Metrics:**

- Continue informal discussions (12 18 months)
- Formalize partnership with defined benefits (18-24months)
- Project success can be measured by execution of a formal partnership agreement, engagement in building our a specialization in the degree program and success in gaining assistance in establishing laboratory facilities

### **Required Investments:**

- Completion of Phase 1 of the iFERM Hub and commitment to complete Phase 2.
- Continued growth and support of fermentation science program
- Hire adequate faculty and staff to support the iFERM Hub and degree program
  - 2-5 new faculty will be needed over the next 2-4 years. Can be a mix of tenure track and non-tenure track/professor of practice with potential for joint appointments in other schools.

### Partnership 2: Advanced Coal and Energy Research Center (ACERC)

### Background:

ACERC's traditional focus has been in coal-related RD&D and its existing suit of partnerships (as defined), to some degree reflect that historical focus. It should be noted, however, that ACERC has begun efforts to broaden its areas of interest and support to more generally encompass other forms of energy production and storage, and encompassing some aspects of mitigation and remediation of the environmental consequences of energy production and utilization.

With that caveat stated, ACERC's existing suit of partnerships currently includes the following:

ACERC supports RD&D efforts in multiple SIU Colleges and Schools, but primarily focuses support in the Colleges of Science and Engineering. Support includes provision of seed grants in support of projects intended to lead to development of proposals to external funding agencies, especially DOE and NSF. A list of seed grantees is available at

https://energy.siu.edu/about/energyboost/grants/interdisciplinary-seed/

A list of external award grantees is available at

https://siuenergytech.blogspot.com/2019/03/siu-energy-related-research-grants.html

(note: These lists do not appear to have been updated since the passing of the previous director.) ACERC also supports Technology Transfer projects for technology developed by faculty supported by the Center.

ACERC maintains memberships/partnerships with the following energy-related organizations:

- Carbon Utilization Research Council (<u>http://www.curc.net/</u>)
- National Energy Technology Laboratory (NETL) <u>https://www.netl.doe.gov/</u>
- US Department Of Energy.

ACERC also maintains two separate advisory boards:

- An Industry/Professional advisory board that provides guidance and connections to an array of energy-related industry and government organizations; and
- The Clean Coal Review Board, which is populated primarily with state government officials, which provides connections and support to and with State Government agencies and which has provided significant funding in support of the Center's efforts.

The current memberships of these boards is given below.

### **Opportunities for Growth:**

Policy makers at State and Federal levels have expressed strong interest in further development and deployment of Clean Energy Technology and energy utility reform. SIU, potentially in collaboration with other organizations including those represented by the memberships of the Center's advisory boards, can *and should* play a significant supporting role in design and implementation of these changes. For this reason, continued occasional participation of the SIU president in the CCRB is critical to development of further opportunities for support for the center's activities through state government agencies. The
Center is currently funded primarily through a grant awarded by the CCRB and opportunities for continued and expanded funding are dependent on continued system-level support.

#### Potential for ROI:

The primary mission of ACERC is to promote and support energy-related research and scholarship at SIUC. This is accomplished through awarding of small seed grants, which are then used to leverage proposals for funding through external agencies and industrial partners. The mix of agencies and industrial partnerships is continuously in flux, depending on the correlation of faculty interests and external interests and opportunities, but historically, a steady flow of external grants have been brought in through and with the support of the center. It has also been proposed that the center assume an expanded role in development and coordination of energy-related curriculum, which would provide additional opportunities in both workforce training and student education.

#### **Timeline and Metrics:**

The Center is currently seeking new leadership following the passing of its previous director. It is expected that once in place the new leadership will develop a new strategic plan for the center and that specific goals and metrics will be developed at that time.

#### **Required Investments:**

Given the current leadership situation at ACERC, the center does not require any new monetary investment at present, only continuation of current support, until a new strategic plan is developed and implemented. It does, however, require the continued commitment of the Office of the System President, with respect to participation in the CCRB.

#### ACERC advisor board membership.

ACERC Advisory Board	Clean Coal Review Board (CCRB)
Mr. John Mead, ACERC Director Emeritus	Mr. Phil Gonet, Ex-President, Illinois Coal
Dr. Norm Peterson, Director, Government	Association, (and other State offices)
Relations, Argonne National Laboratory	Mr. Joe Angleton (ex. UMW and Illinois Dept.
Dr. Thomas A. Sarkus, Director, Project Financing	Mines and Minerals)
& Technology Deployment Division, Office of	IL State Senator Dale Fowler
Major Demonstrations, Strategic Center for Coal,	IL State Senator Paul Schimpf
National Energy Technology Laboratory, U.S. Department of Energy	IL State Senator Andy Manar
<b>Dr. Don Stevenson</b> , Managing Director for Energy Supply and Conversion, Gas Technology Institute	IL State Senator Rachelle Crowe
	IL State Representative Terri Bryant
<b>Dr. Kevin O'Brien</b> , Director, Illinois Sustainable Technology Center	IL State Representative Dave Severin
	SIU System President Mahoney

## Partnership 3: Cybersecurity Research and Center for Cybersecurity

## Background:

For the past 15 years, the SIUC School of Information Systems and Applied Technologies (ISAT) has offered an undergraduate Cybersecurity concentration with a minimum of 15 credit hours of courses, covering network security, wireless security, and other information assurance courses: https://isat.siu.edu/undergraduate/infomation-technology/areas-of-study.php. ISAT has a Graduate Certificate of Cybersecurity program focusing on Cloud Security and Information Warfare serving both SIU students and working professionals. ISAT had a Center for Information Assurance and Security Education (CIASE), which was designed by the National Security Agency (NSA) and Department of Homeland Security (DHS) from 2010-2015: <a href="https://ciase.siu.edu/resources/information-assurance.php">https://ciase.siu.edu/resources/information-assurance.php</a>. At present, ISAT faculty are working on renewing the national designation, moving CIASE into a Center for Cyber Defense Education (<a href="https://ciase.siu.edu/resources/nsa-scholarship.php">https://ciase.siu.edu/resources/nsa-scholarship.php</a>) offered SI3C Cyber Scholarship Program (<a href="https://ciase.siu.edu/resources/nsa-scholarship.php">https://ciase.siu.edu/resources/nsa-scholarship.php</a>) offered SI3C Cyber Scholarship to students for several years. Students conduct online security exercises using the NETLAB+ virtual information technology laboratory, supporting both on-campus and online cybersecurity courses teaching and research activities. ISAT is in the process of starting a new BS degree program in Cybersecurity Technology.

ISAT is also the home of two very active cybersecurity-related Registered Student Organizations: Security Dawgs and Women in Cybersecurity. The Security Dawgs compete each year a several cybersecurity-related events such as the Collegiate Cyber Defense Competition and National Cyber League. While members of Women in Cybersecurity also participate in Security Dawgs, this group specifically focuses on issues related to women in the field, conducting research and often attending the national WiCyS conference. Both groups also conduct a number of outreach activities each year including, but not limited to, Security Dawgs Security Day, workshops and events for the campus community and the public, and participation in events for targeted groups such as the Boy Scouts and Expanding Your Horizons.

Additionally, ISAT faculty are routinely called upon by public organizations to provide expert information and advice. For example, a recent local television special about the dark web featured ISAT faculty and Security Dawgs president (<u>https://www.kfvs12.com/2019/11/01/whats-lurking-dark-web/</u>).

The SIUC School of Computing is working on establishing a <u>Center of Academic Excellence in</u> <u>Cybersecurity Research (CAE-R)</u>.

#### **Opportunities for Growth:**

Quick approval of ISAT's new Bachelor of Science in Cybersecurity Technology could fuel rapid enrollment growth. This is a high-demand degree program, and Southeast Missouri State University's program, less than an hour from Carbondale, attracts many Illinois students. Further supporting this new degree program with at least one additional tenure-track faculty member would help increase the

program's enrollment capacity and contribute to the production of cybersecurity-related research within SIU.

The SIU System can help build a strong partnership with Federal and State agencies, as well as industry partners. The <u>State of Illinois Cybersecurity Strategy</u> 2017-2019 calls for partnership with stakeholders across state government as well as other private and public sector stakeholders, and the National Governors Association has facilitated collaboration across states. This Cybersecurity partnership initiative will increase student enrollment in academic programs, increase research funding, and galvanize regional economic development.

## Potential for ROI:

The job growth rate in Cybersecurity is 32% from 2018-2028, much faster than other sectors, according to the Occupational Outlook Handbook of the U.S. Bureau of Labor Statistics:

https://www.bls.gov/ooh/computer-and-information-technology/information-security-analysts.htm. So the potential ROI in Cybersecurity partnership is huge. As a preliminary prediction, I would like to list the following outcomes:

- SIU system-wide student enrollment increase from 2020 2025: 500, which translates into at least \$5M in student tuition/fee revenue;
- SIU system-wide extramural grant and contracts received in Cybersecurity areas from 2020-2025: \$150M;
- SIU system-wide startups, patent/licensing, and technology transfer around Cybersecurity R&D will increase significantly; and
- Non-monetary ROI: SIU will be the second public university in Illinois with both CAE-CDE and CAE-CDR centers.

## Timeline and Metrics:

- 1. 6 10 Months: to establish a Cybersecurity R&D taskforce, including researchers, industry leaders, government agencies and key application area representatives (such as healthcare, financial institutions, critical infrastructures, etc.).
- 2. One Year 18 Months: to get CAE-CDE and CAE-CDR established.
- 3. One-Year 24 Months: to submit 3-5 significant grant proposals.
- 4. 2 3 Year: ROI from Cybersecurity applications based on SIU Cybersecurity R&D taskforce, and ROI for industry/business partners.

#### **Required Investments:**

- 1. A full-time, 12-month, Research Coordinator, to be hired. Estimated annual salary: \$120,000
- A full-time, 12-month, civil service supporting staff, to be hired. Estimated annual salary: \$45,000
- 3. A Cybersecurity Lab space of at least 10,000 sqft, used for research and collaboration. Estimated remodeling cost: \$10,000
- 4. Cybersecurity R&D equipment, estimated cost: \$90,000

#### Partnership 4: Child Development Laboratory

#### **Background:**

The Child Development Laboratory is located on the SIU campus with three classrooms for infants, toddlers and preschoolers. It is a critical partnership with the Early Childhood and Child and Family Services programs within the School of Education. The CDL is funded by Southern Region Early Childhood Programs. The CDL provides field experiences for several courses, providing real-life training for our majors who are working toward an endorsement in a licensure program in Early Childhood Education, a Director, Early Care and Education and/or an Infant/Toddler certificate in our Child and Family Services undergraduate programs. Students from several programs come to the CDL for observations, developmental assessment practice and environmental assessments as well as many other forms of practice. Presently, Southern Region provides the facility, staff, classrooms/materials, for the all pre-service students. The funding for the CDL is through state grants whereas in the past it was funded through tuition of children attending the programs and the former College of Education and Human Services. It is a privilege for our university to have a lab such as this, especially with infant and toddler classrooms, which is a rarity in the state of Illinois. This is an opportunity that many other institutions have lost due to funding issues. We had many who appreciated the unique opportunities of the CDL and worked to keep it as a vital part of our programs for the university and the community.

#### **Opportunities for Growth:**

**Education/training/Community support**. While the CDL has already provides an integral piece for children in the community and some of our programs, there are other vital functions that it can serve. One, is a model for other child care and early education programs located in the region. We have opportunities to provide guidance and trainings for those in the area covering: curriculum mapping, Reggio Emila, and other curriculum as well as to provide demonstrable supports for children who are experiencing trauma, behavioral issues, speech/language and OT/PT challenges. This would be a growth opportunity for graduate students who are working on their education and training in these areas. Graduate assistantships would be a great way to support this essential service learning through their programs (Early Childhood, Speech Pathology and/or Psychology to name a few). The CDL also provides resources for current students and former graduates of the programs. The CDL director has collaborated with ISBE coaches for PFA programs that often bring teachers to CDL to show best practice, learn about nature-based curriculum/environment. She has also set up interactive field trips with local high schools.

**Create a certified outdoor classroom**. Collaboration with Architecture, Plant and Soil Science, Sustainability, etc., could provide experiences/assignments to create new nature spaces on the playground. This provides a model for other programs and this is something that is gaining attention around the world as an ideal for children's learning.

**The Infant/Toddler classroom**. The quality experiences in the infant and toddler classrooms are extremely limited in our area. There is a need for expansion of the classrooms and/or additional classrooms. Meeting the needs of the low-income population of our area and providing them with

parent education and support services has a positive impact on the local population. This could be extended with funding for more classrooms. This also provides rich experiences for students, undergraduate and graduate.

Research. The CDL has not been used for research in years. This needs to be revitalized.

#### **Potential for ROI:**

CDL offers experience for students. They are provided with workforce training and education...and if they live in the area, there is a direct line to job placement within Southern Region, other early childhood programs and the public schools. By having more education programs and support to assist other programs, we can also provide impetus for further training. This would provide financial income as these should provide community service that benefits our area and the children in the area. The partnerships could include **contracts** with agencies for services, grant **funding** for projects such as the outdoor classroom, and **funding** for research projects taking place in the CDL.

#### Timeline and Metrics:

Year 1:	
Develop MS program to address needs of state	Application for MS degree/collaboration
(employment opportunities, job openings). This is a	with other programs
one year MS program	Proposal for funding of parts of outdoor
Explore ways to implement outdoor classroom for low-	programming
income children to be included in diverse classroom	Connect with 3-5 entities for outdoor
environment	program and for building
Seek funding for outdoor classroom (private and public)	professional communities
with partnerships	Educate staff on outdoor programming
Establish partnerships with other entities on campus and	for young children
off-campus	
<b>Develop</b> offerings for child care providers for training to	
bring model program in southern region	
Promote feasibility of research in CDL	
Explore opportunities for more infant/toddler programs	
Year 2	
Promotion of specialized programs in CDL to meet	Recruitment of graduate students
community needs (trauma, sensory issue, behavior	Grant proposal to support research
issues)	Conference for area professional
<b>Development</b> of graduate courses – online and face-to-face	including undergraduate students
with CDL partnership	Hire support staff to help with
Collaborate with on campus and off campus partners	community education and plan and
Collaborate on research projects	carry out a conference.
Plan conference for childcare professionals and students in	Recruit children for classroom for
training. It is critical that we have more offerings for	outdoor classroom
this area and the CDL has the potential to be a model	
for working with traumatized children, behavior	
problem, development of outdoor program	
Build outdoor program for community with partners	

Year 3	
Develop more partnerships	Students educated in graduate
Build programs with professional entities	program
Continue and extend educating and modeling opportunities	Children served in outdoor program
	Education of others about benefits of
	outdoor programs for young children

#### **Required Investments:**

The support would help to move the CDL to a more prominent role in education and support to move it forward as a role model in the southern region area and further.

Graduate student assistantships: 2- 50% graduate students or 4 25% graduate assistantship.

These positions help with the children's programs, community service and education programs. **Facility upgrades**: Infant and toddler classrooms need more rooms. A substantial help would funding for extension of the infant room, and other updates such as ceiling tiles, cabinetry, etc.

**Equipment**: There is potential for equipment purchases for outdoor classroom: woodworking, mud kitchen, trees, large garden.

#### Partnership 5: School of Education - Rural Schools Initiative

#### Background:

To date, faculty in the new School of Education (SOE) have partnered with Regional Offices of Education, Illinois Association of School Administrators (IASA), Illinois Association of Rural and Small Schools (AIRSS), the Library of Congress, the STEM Education Center, Touch of Nature, and university colleagues in Agriculture, Architecture, Anthropology, Geography and Environmental Resources, History, and Zoology to support local school districts with professional development, on-site graduate programs of study, summer and afterschool educational programs for PreK-12 students, and other educational resources. These partnerships have included federally- and state-funded School Improvement Grants (SIG) for \$150,000 per year, 21<sup>st</sup> Century Learning Grants for \$25,000-\$60,000 per year, and Grow Your Own Programs for \$300,000 per year, to name a few. Service and research grants have included National Science Foundation Grants for \$50,000 per year and Illinois State Board of Education funding for \$250,000 per year.

Examples of these projects and partners include the following:

Association of Illinois Rural and Small Schools - <u>https://www.airssedu.org/</u> Center for Archaeological Investigations - <u>https://cai.siu.edu/</u> Educating with Evidence - <u>https://educatingwithevidence.siu.edu/</u> Illinois Association of School Administrators - <u>https://www.iasaedu.org/</u> Illinois Multi-Tiered System of Supports - <u>https://ilmtss.net/</u> STEM Education Center - <u>https://stemedresearch.siu.edu/</u> Touch of Nature Environmental Center - <u>https://ton.siu.edu/</u>

#### **Opportunities for Growth:**

Through support from the SIU system office, expanding these opportunities can help us increase enrollment in current programs, address state-wide teacher shortages, seek additional funding for research in education, and develop educational opportunities for teachers through state and federal funding for schools in our region.

#### **Potential for ROI:**

Overall, a network of partnerships between the university and the 150+ school districts it serves in the immediate region provides several opportunities for a return on investment. First, partnering with districts for 21<sup>st</sup> Century Learning Grants, School Improvement Grants, and Grow Your Own programs supports teachers' professional advancement and brings these **tuition dollars** directly to the university. Second, this work increases our districts' connections to specific faculty in the School of Education for additional **contracts** for focused professional development and other professional services. Third, these partnerships increase the School of Education's access to test sites and participants for service and research **grants** from state (e.g. Illinois State Board of Education) and federal (e.g. National Science Foundation) agencies. Fourth, these increased connections with partners support our **students' education** and **job placement**, especially in high needs areas such as special education, foreign languages, and secondary science and math. Finally, connecting our regional schools to resources at the

School of Education, in general, and to the STEM Education Center, Touch of Nature Environmental Center, and the Center for Archaeological Investigations, more specifically, **expands unique learning opportunities** for the 5,200+ teachers and the tens of thousands of PreK-12 students we all serve.

#### **Timeline and Metrics:**

Overall, the goal for these partnerships is as follows: **Expand and deepen the School of Education's connections to school districts in the region we serve**. In order to do so, we propose the following timeline of activities and measures of success.

Timeline	Activity	Metric
Year 1	<b>Establish</b> an office for school partnerships and outreach in the School of Education.	150+ schools visited/contacted for recruitment
	Develop a cohesive plan of supports the	3-5 learning "hubs" established
	School of Education can offer local and regional schools.	25% increase in enrollment for Ed.D. and MSEd programs
	Locate strategic learning "hubs" to increase graduate program delivery south of Interstate 64 (for MSEd and Dual Credit programs) and south of Champaign-Urbana (for Ed.D. program).	25% increase in enrollment for initial licensure programs
Year 2	<b>Collaborate</b> with regional school districts to access state and federal grants that support their faculty's professional	3+ state- and/or federally-funded grants to support PreK-12 faculty professional development and advancement
	as well as their students' learning.	MSEd programs
	Integrate local STEM and environmental education learning opportunities for teachers and students.	25% increase in enrollment for initial licensure programs
Year 3	<b>Open</b> a location for educational resources and professional development for	6+ state- and/or federally-funded grants to support PreK-12 faculty professional
	community members, current students, and local educators.	3+ state- and federally-funded grant applications to support service and research
		100% increase in enrollment for Ed.D. and MSEd programs

#### **Required Investments:**

#### Director of Partnerships and Outreach – 50% or 100% AP Position

Serves as the liaison between the School of Education, Recruitment & Retention Officer, and partnering school districts.

#### Grants Support Officer – 25% or 50% AP Position

Supports the identification, development, and supervision of grant funding.

#### **Space Renovations**

Renovations are requested for: 1) director and office support staff, 2) STEM Education Center labs and student learning spaces, and 3) educational resource room(s) for community, PreK-12 school, and university student engagement.

## Partnership 6: SIUC-SIH Strong Survivors Exercise & Nutrition Program

## Background:

Strong Survivors (<u>https://strong-survivors.siu.edu/</u>) is a collaboration between three entities:

1) SIUC School of Human Sciences Exercise Science Program

(https://ehs.siu.edu/kinesiology/undergraduate/exercise-science/)

- Dr. Phil Anton (<u>https://ehs.siu.edu/kinesiology/faculty\_staff/faculty/anton\_philip.php</u>) and SIUC undergraduate and graduate students)
- 2) Southern Illinois Healthcare (<u>https://www.sih.net/</u>)
- 3) John A. Logan College (<u>https://jalc.edu/</u>)

Many members of the SIUC RSO Organization of Sport and Exercise Science are involved in the program as staff members.

Strong Survivors is a free program dedicated primarily to using exercise as a therapeutic tool to help cancer survivors & caregivers get through their treatment & recovery process & achieve an enhanced level of quality of life. The program accomplishes 3 objectives:

- The collection & analysis of research data pertaining to cancer rehabilitation & survivorship. This allows us to contribute additional information to the knowledge base that exists currently through research journal articles, regional & national conference presentations, etc.
- Graduate & undergraduate SIUC students who pass the Strong Survivors Staff Training class (KIN 402) are able to gain hands-on experience as a staff member. Students are able to:
  - practically apply knowledge gained in the classroom
  - develop professional exercise testing & training skills, as well as proficiency in data collection/analysis
  - work with an atypical population that typically presents with interesting/challenging medical & fitness issues
  - gain valuable resume credibility that is extremely useful in the job search & graduate/professional school application process
  - experience personal growth working with individuals battling a number of daunting challenges
    - this growth occurs in the relationships built with the participants, as well as the perspective gained from these interactions.
    - this growth fosters the development of empathy amongst our graduates.
- 3) Most importantly, this program offers cancer survivors & caregivers the opportunity to improve their quality of life through improved fitness/wellness & the management of cancer & cancer treatment-related physical & psychological symptoms/side effects.

Participants enter the program at any time point following diagnosis (both during & after treatment). If they have survived the words: "You have cancer." they are a cancer survivor and they and their caregivers are eligible.

Participants can access the program in three ways:

- A) The SIH-SIUC Strong Survivors class at John A. Logan College
- We offer a free 12-week class at the Community Health Education Complex (CHEC) at John A.
  Logan College. The 2-day per week class meets Tuesdays from 5-6:30 PM & Thursdays from 5-6
  PM.
- The class sessions explore the relationship between physical activity/nutrition & cancer survivorship.
- Each participant is assigned a personal trainer (trained Strong Survivors staff member) who develops & supervises an individualized exercise program based on the participant's fitness status (including physical assessment data), medical history, & personal goals. Each participant progresses at their own pace & the exercise program is designed to address needs specific to each individual.
- B) The SIUC Strong Survivor Cancer Rehabilitation Laboratory (CRL)
- The CRL is located in Davies Hall (aka Davies Gym) rm. 123 on the SIUC campus. Survivors & caregivers are assigned a staff member who constructs & supervises their exercise program in the same manner as described above for the Logan class.
- The CRL provides two elements that the Logan class does not:
  - A flexible schedule. Exercise session times are available at any time from 7 AM-8 PM, M-F.
  - 2. A more private setting for exercise. Although the fitness facility at Logan is welcoming & well-maintained, it is still a public place & the CRL environment is preferable for some of our participants.
- C) Home-based sessions
- Home-based exercise training via phone/email is available for participants who cannot attend the Logan class sessions or are unable to travel to the SIUC-CRL.

## **Opportunities for Growth:**

Increased community outreach in the region. We hope to establish satellite locations in areas of the region where travel to sessions at Logan and SIUC is prohibitive for numerous reasons. These would likely be fitness centers, rec centers, physical therapy clinics, etc.

Increased coverage across the country/world as students who participate as staff members graduate and career the work forward to their new location.

Strong Survivors is a powerful recruiting tool that has helped us to recruit and retain students. Nearly everyone has a cancer connection of some sort and students/families see this as a way to help this population. Strong Survivors is one of two student-oriented programs in the country that offer this unique professional development experience (see description of these benefits above).

Strong Survivors could be an attractive avenue for entities who grant research dollars.

#### **Potential for ROI:**

Please describe mechanisms by which the institution(s) and/or system could see increases in revenue as a result of growth in the partnership. Both monetary (grants, contracts, fees for service, etc.) and non-monetary ROI (workforce training, student education, job placement, etc.) can be included in this description.

SIUC could see increases in tuition dollars as students continue to choose our university because of the Strong Survivors opportunity.

As stated above, SIUC could see increases in grant funding dollars directed toward this program.

As described above workforce training, student education, and job placement are all enhanced when students participate as staff members in this program.

#### **Timeline and Metrics:**

Over the next 2-3 years, we hope to increase our grant funding for student staff member assistantships/paid positions.

Over the next 4-5 years, we hope to increase the number of students in our undergraduate and graduate exercise science programs by 10-15%

#### **Required Investments:**

Strong Survivors just completed a major renovation project that allowed us to move our Cancer Rehab Lab from Davies 132 (a shared space with Biomechanics and Motor Behavior faculty) to Davies 123. This included the re-purposing of Davies 123 (paint, flooring, bottle filling station, etc.) and the purchase of new equipment. This was all accomplish via donations to our SIU Foundation Strong Survivors Fund (https://siuf.org/giving/payment.php)

As we continue to use the new space, equipment needs will continue – repairs, purchase of new equipment, etc. will all need to happen. That said, investment in the people of Strong Survivors is where the true success of Strong Survivors lies. The program is entirely dependent on the interaction of the student staff members and participants. Any monetary support for the program that could go toward the support of the student staff members would be greatly appreciated.

#### Partnership 7: MRI RESEARCH & TRAINING CENTER



Initial idea proposed by Drs. Gregory Rose and Michael Gray (2014)

Revised and updated (2020) by Dr. Rich Clough, SIU School of Medicine

Note: A "Core Council" (advisory council) for the Center <u>has been established</u> with members that represent all "Partnership" Colleges, Schools, Departments, Student Health and Saluki Athletics.

#### **Background:**

SIU and School of Medicine (SOM) undergraduate and graduate students, athletes, clinicians and research faculty, including students seeking careers in biomedical imaging, and the people of Southern Illinois would significantly benefit with establishment of a state-of-the art MRI Research, Imaging and Training Center (MRI Center) on the SIUC campus. An MRI Center would provide value-added partnerships between SIU Student Health, SIU Athletics, SIU-SOM, SIU College of Science, SIU Rehabilitation Institute, and the SIU College of Applied Sciences and Arts (CASA) MRI training program. Potential community partners in this initiative (for research purposes and patient recruitment) would include Brehm Preparatory School (already a partner), Carbondale Neurorestorative, the Carbondale Gateway Foundation (addiction rehabilitation), the Center for Rural Health, and others. The MRI Center would include a dedicated facility, a 3-Tesla MRI machine, recording equipment, complementary computer analysis, and subject/patient interview suites. Such collaborations would be accretive to a markedly expanded niche in imaging research for SIU. A Center would also substantially enhance SIUC's Radiology training programs in CASA. An MRI Center would make SIUC a preferred choice for undergraduate students seeking training for a career in imaging since few other baccalaureate MRI training programs are available in Illinois. Lastly, establishment of an MRI Center would allow additional, more timely and more cost-effective clinical and research imaging for SIU students. Imaging for our student athletes has been problematic over the years and an MRI Center would alleviate this problem by providing cost-effective and ready access.

#### **Opportunities for Growth:**

New MRI technologies used in a dedicated MRI Research and Training facility would provide an unparalleled opportunity for new and important (and highly fundable) research at SIU. Establishment of an MRI center would provide a unique resource to expand ongoing neuroscientific and neuropsychological research at SIU. Research in chemistry and of development of MRI "contrast" agents (presently ongoing) would also benefit from an MRI Center. Moreover, a functioning MRI Center would allow for significantly expanded collaboration with other research centers in the United States including a new Center at the University of Illinois in Champaign, Washington University in St. Louis, and Stanford University in California (partnership now exists) in particular. Such collaborations would be accretive to an expanded and potentially lucrative niche in imaging research for SIU. Such a center would also offer opportunity for neuroscience faculty (many struggling to get research grant dollars), to re-direct their research into a new and highly funded area. SIUC and SIU-SOM faculty in Carbondale have a history of MRI research that is presently made possible through a cooperative agreement with nearby Southern Illinois Healthcare's (SIH) Memorial Hospital of Carbondale. However, faculty now have to schedule their MRI research studies around SIH imaging services for patients and are restricted to a 4-hour window on Sunday afternoons to conduct their research. Research and Clinical applications for MRI have expanded quite considerably in recent years with the development of improved methods to observe, for examples: neural substrates of cognitive processing; the integrity of brain networks necessary for complex functions; noninvasive assessment of brain chemistry using magnetic resonance spectroscopy; discovery of patient-personalized neural circuitry involved in mental health disorders; and with that, offering a new possibility of patient-personalized neurotherapeutics (i.e., for novel treatments of

psychological/ psychiatric disorders and brain injury, etc.). An MRI facility would provide opportunity to engage more SIU faculty from traditional (e.g., brain imaging, psychology, etc.) and nontraditional usage (e.g., materials science, architecture, chemistry, etc.) and bring forth new funding opportunities in research on the SIUC campus.

In addition to bringing new research dollars to SIUC, such a facility would serve as an attractive recruiting tool for undergraduate and graduate students. MRI is an intricate and highly technical imaging modality and thus requires education and training. A SIUC-unique, and important component of SIUC's mission, is student training in MRI technology by the Radiologic Sciences Division, School of Allied Health, SIUC's undergraduate and graduate training programs in MRI technology are ones of their kind in the State of Illinois. These programs train MRI technologists and imaging specialists who gain employment in Southern Illinois and beyond. An MRI Center on the SIUC campus would provide for enhanced and comprehensive training in MRI technology and a lucrative path for SIUC students. An important part of the training program involves hands-on experience with MRI equipment. Having an on-site MRI Center would indeed make SIUC the preferred choice for individuals seeking training in this field. In addition, undergraduate and graduate students in multiple disciplinary fields (e.g., physics, chemistry and engineering, etc.) would similarly benefit from on-site MRI research and imaging facilities. Lastly, it is anticipated that use of the MRI Center would be on a fee-for-service arrangement for users that would be more cost effective than current practices.

#### **Return on Investment:**

Increased availability of "magnet time" for research would allow for significantly increased submission of grant applications, indirect cost recovery, and scholarly works at SIU. An MRI Center at SIUC would eliminate the primary problem of limited access to an MRI machine and analysis system for research faculty. This limited time frame severely restricts research and the number of research subjects in any study and draws the duration of a study to inordinate lengths of time. Often, research subjects must travel long distances to participate in research studies, and this time frame is not accommodating to research participation. It is expected that the annual revenue acquired by the MRI Center will eventually offset the annual operating costs and build-out. Grant and Foundation sources are available through the State of Illinois, NSF, NIH, several foundations, crowd-source funding and Capital Campaigns that will be sought to support the build-out as well as pilot MRI and associated research "seed-grant" initiatives. Lastly, partnerships with research-relevant or health-care related industries will be sought to reimburse or otherwise offset operating and build-out costs. The Center would also provide improved access and more-cost effective clinical imaging for SIUC college students as arranged through negotiations between Student Health Services and the student health insurance plan at SIU now provided by United Health Care. A mutually beneficial arrangement for imaging services will be afforded by an established MRI Center. Finally, it is anticipated that an MRI center would attract an increased number of undergraduate, graduate and post-graduate level students. The Return on Interest of such a center would be appreciable in terms of monetary capital, workforce development, student services, research productivity, and importantly the advance and progress of the SIU system overall.

An MRI Research and Training Center, and the opportunities afforded by its establishment, would support a key element in an overarching effort to: keep SIUC competitive with its peer institutions; allow SIUC to refine a research niche unique to this University; and to help the University maintain its High Research Status Carnegie classification. The Illinois Public Agenda encourages initiatives and programs that advance 21<sup>st</sup> century technologies with a corresponding intellectual framework, research, pedagogies, resources, and a cutting-edge workforce. These goals are also in accord with the key elements of SIU's long-term strategic plan and the Strategic Plans of the SOM.

## Timeline, Metrics and Goals:

## Goals: Develop, Research, Learn, Provide, Collaborate

- 1. Develop: a state-of-the-art dedicated MRI Research, Imaging and Training Center.
- Research: greatly expand clinical and research imaging (e.g., personalized neurotherapeutics for psychiatric disorders – <u>ongoing</u>, mapping functional neurocircuitry, <u>ongoing</u>) and MRI 'contrast' chemistry (ongoing).
- 3. Learn: in a "living classroom" for MRI training where lectures and hands-on-the-machine experiences can be achieved, improving SIUC student recruitment and retention.
- 4. Provide: researchers, undergraduate and graduate students opportunity to work or expand research in MRI imaging & chemistry; and to facilitate MRI imaging for Student Health Services and Saluki Athletics.
- 5. Collaborate: in an environment to enhance interdisciplinary and multidisciplinary research both within SIU and with faculty at other national and international institutions.

## Proposed timeline of facility development:

- 1. Development of an MRI Center could begin in FY-21 with space identification and renovation approx. 6 mo.
- 2. Once space is determined, the MRI Center could be completed and operational within an additional 6 months.

## Proposed metrics of facility income: Sources include clinical and research imaging

- MRI Scanner usage charges (for researchers) @ \$200-400/hr (research usage averaging 4 hours/day, 5 days/week for 48 weeks): \$384,000
- Indirect cost recoveries from extramurally funded research typical IDC/\$1.5 million grant = about \$700,000).
- 3. Number of Clinical MRI sessions for SIUC Students and Athletes (Student health insurance, proposed \$400/scan, anticipate 5 scans per week/48 weeks ~ \$96,000)

Proposed metrics of facility effectiveness in research and scholarly activity:

1. Number of grant applications, research papers, abstracts and memorandums of understanding agreements between SIU and external Partners/year developed with the MRI Center.

#### Required Investment (and sources of Revenue estimates:

## Build-out estimates:

- 1. Renovation of existing space (\$350 foot<sup>2</sup>): \$700,000 (2,000 feet<sup>2</sup>).
- 2. 3.0 Tesla MRI machine: \$1,500,000\* one scanner to be purchased initially
- Finishing: includes MRI shielding, antechamber, office and waiting room furniture, computers, video and communication equipment, ancillary and disposables: \$350,000
   Total build-out investment: \$2,550,000\*

## **Operating cost estimates:**

- 1. Staff salaries (quarter-time Director and full-time MRI technologist who would oversee imaging and handle scheduling and billing: total salary cost approximately \$100,000 per year
- 2. Service contract for the MRI scanner: approximately \$155,000 per year
- 3. Utilities: approximately \$40,000 per year

Total Operating cost estimates: \$295,000/year

Facility Income estimate: \$400,000/year (does not include IDC from grants).

## Partnership 8: Center for Autism Spectrum Disorders

## Background:

The Center for Autism Spectrum Disorders (CASD) is a partner in The Autism Program of Illinois (TAP) <u>https://www.tap-illinois.org/</u>. The partnership between CASD and TAP began with the founding of TAP in 2003. TAP is funded through the Department of Health and Human Services (DHS) in Illinois. TAP is managed by Hope Institute in Springfield, IL <u>https://hope.us/</u>.

CASD is a multidisciplinary center involving students and faculty from behavior analysis and therapy, communication disorders and sciences, and psychology. As part of SIUC re-organization, CASD has moved from the Rehabilitation Institute to the School of Psychological and Behavioral Sciences. The director is Mark Dixon, professor in behavior analysis and therapy (BAT). Becky Barron, a doctoral student in BAT, is associate director of CASD. Dr. Dixon and Becky currently coordinate the language and cognitive development clinic at CASD. Diagnostic services at CASD are conducted in partnership with two community school psychologists from different special education cooperatives and pediatricians from Shawnee Health Care <a href="http://www.shawneehealth.com/locations/shc-carbondale/">http://www.shawneehealth.com/locations/shc-carbondale/</a>.

Valerie Boyer, associate professor in communication disorders and sciences, coordinates the speechlanguage clinic at CASD and will become the primary investigator for the TAP grant in July 2020, following Dr. Dixon's departure from SIUC. As part of the SIUC re-organization, the communication disorders and sciences (CDS) program has moved from the Rehabilitation Institute to the School of Health Sciences. CASD will become a center that connects programs across Schools on campus.

Michelle Kibby, professor in psychology, is in negotiations to become Director of CASD in July 2020. Her goals include diversification of funding to increase diversity of services provided at CASD including establishing psychological clinics for children, adolescents and adults with ASD. If hired, she plans to reach out to other Health and Human Sciences schools. Karla Fehr, associate professor in psychology, plans to expand consultation services at CASD in fiscal year 2020. Dr. Fehr and Dr. Boyer both submitted research applications for funding projects of \$10,000.00 to The Hope Institute, the TAP manager.

#### **Opportunities for Growth:**

CASD finds itself in transition, with opportunities for new partnerships and clinical services. First, the CDS program is actively searching for a tenure-track faculty member to join faculty in fall 2020. Our finalist is a dual certified speech-language pathologist and board-certified behavior analyst with emphasis in ASD and augmentative and alternative communication. With system support to hire, the communication disorders and sciences graduate enrollment will grow as we will accept a larger cohort of students. It is anticipated that the new faculty member will establish clinical services at CASD and supervise graduate clinicians as part of that clinic.

Second, Hope Institute has proposed a partnership to establish a Hope ABA Clinic at the CASD. Please see the attached letter for an overview of their proposal. Hope would like to provide ABA services on the SIUC campus, furnishing opportunities for clinical work for students in the undergraduate and

graduate programs in behavior analysis and therapy. While this is an exciting opportunity, we do have concerns about space. CASD has one large therapy space that will need to be shared between the new and existing clinics. System support to expand our physical footprint at SIUC would enable multiple clinics to function simultaneously at CASD.

Third, Michelle Kibby has been identified as a strong candidate to assume the role of Director of CASD. Dr. Kibby will seek to expand the services and research offered through CASD with the goal of increasing and diversifying CASD's funding sources and increasing its national visibility and reputation. Dr. Kibby has requested a course reduction to assume duties at CASD. With system support, Dr. Kibby can begin as CASD Director and work to enhance research activity and attract increased grant funding to CASD.

Finally, the CoVID19 outbreak offers the opportunity to establish telehealth services as part of our community engagement. With a system investment in technology, we could begin to increase service provision via telehealth.

#### **Potential for ROI:**

The new faculty hire in CDS will lead to increased student enrollment in the CDS program and increased deliverables on the current TAP grant. Both increased enrollment and increased deliverables will bring increased revenue to SIUC.

The partnership with HOPE would lead to revenue in the form of rent for the space. HOPE Institute is decreasing the SIUC grant for FY 2021 to \$160,000.00. Any rent that is received would help bridge the loss of grant dollars that is occurring due to faculty departures in the behavior analysis and therapy program. I believe even if new hires were made in the behavior analysis and therapy program, HOPE would still pursue the new partnership as HOPE has been growing their own clinics in other parts of Illinois. The clinic will come to southern Illinois; the question is whether or not the clinic is located on the SIUC campus or in another location.

Dr. Kibby has a history of successful NIH funding. CASD has not had NIH funding during its existence on campus. Dr. Kibby also plans to collaborate with other colleagues in her School and College to support their research and external funding requests. Dr. Fehr is one identified partner.

#### **Timeline and Metrics:**

- 1. Establish augmentative and alternative communication clinic at CASD. Fall 2020-Fall 2021
- **2.** Establish collaborative relationship with Hope Clinic at CASD. Hope Clinic has requested that the rental agreement be put in place in summer 2020.
- **3.** Diversify funding to increase overall grant dollars associated with CASD. Fall 2020 Fall 2022
- **4.** Establish telehealth component for screening procedures and speech-language clinic 2020spring 2021.

#### **Required Investments:**

1. Continued support for the hire of a TT faculty member in communication disorders and sciences.

- 2. Establishing rental agreement with Hope Clinic at CASD. Identify space that may be utilized to increase footprint of the CASD. Invest in any remodeling that may be required to convert space to pediatric therapeutic space.
- 3. Support course reduction requested by Dr. Kibby
- 4. Financial support for HIPPA compliant telehealth platform, loaner laptops for families/graduate students, and several loaner webcams.



15 East Hazel Dell Lane Springfield, IL 62712 hope.us

> P 217.585.5437 F 217.786.3356

Valerie Boyer, PH.D., CCC-SLP SIU – Center for Autism Spectrum Disorder

Dr. Boyer:

I am writing to express interest in utilizing the space currently occupied by the SIU Center for Autism Spectrum Disorder to fill an existing gap in therapeutic interventions for children with developmental disabilities in Southern Illinois and to provide practical education opportunities for SIUC students. It is our understanding that the University has decreased its capacity to provide ABA services to the Southern Illinois Region and in collaboration with The Autism Program of Illinois (TAP) Hope is willing to open up ABA services through a clinic setting to that region while utilizing your space which is already set up and ready for clinic usage.

A collaboration between Hope and SIUC will provide vital employment and volunteer opportunities for SIU students. Together, Hope and SIUC can train and educate exceptional BCBAs who will serve the local community Specifically, SIUC students pursuing a BCBA or BCaBA will gain the opportunity to complete clinical supervision in an experienced, networked, fast-growing nonprofit company, under a site lead hired with the explicit understanding of supervising SIU students. At Hope, SIU students will find extensive opportunities for hands-on treatment plan implementation and clinical supervision. SIU students will also be welcome to conduct clinical research in the Autism Clinic. As a multi-state company that has grown from 500 to 750 employees in just three years, Hope can provide students with practical expertise and a wealth of resources and connections.

Additionally, a cooperative agreement between Hope and SIUC will fill a gap in service provision in the Southern Illinois region. It is estimated that approximately 45,000 school-age children with developmental disabilities live in Illinois alone. Many of these children, especially in the Southern Illinois region where fewer clinical service providers are available, cannot access medically necessary therapeutic interventions. By expanding services to the current SIU Center for Autism Spectrum Disorder, Hope can help fill that gap. Hope's 63 years of experience with ASD and developmental disorders will provide exceptional care for Carbondale and the surrounding area.

Hope supports children and families to reach optimum growth, independence and joy. Hope is Accredited by AdvancED, NASET (National Association of Special Education Teachers), & CARF



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> P 217.585.5437 F 217.786.3356

The current SIU Center for Autism Spectrum Disorder provides an ideal location and equipment for therapeutic service interventions for children with ASD and their families. With support and approval from SIU, Hope will explore the opportunity to expand our Autism Clinic in the current Center for Autism Spectrum Disorder at Southern Illinois University–Carbondale. The proposed mutually beneficial collaboration will positively impact SIUC students and Southern Illinois children with developmental disabilities.

I appreciate your willingness to discuss with us options to utilize your space whether it would be a lease option or collaborative option or a combination of the two. To meet grant project deadlines, we request a response within two weeks of letter receipt with the expectation of a lease agreement in effect by May 1. For more information regarding this inquiry, please contact the Chief of Business Development Skylar Tierney at <u>stierney@hope.us</u> or 217-525-9536 ex. 30101. Thank you for your consideration.

Sincerely,

Clint Paul, CPA MPA President and CEO

Hope supports children and families to reach optimum growth, independence and joy.

Hope is Accredited by AdvancED, NASET (National Association of Special Education Teachers), & CARF

## Partnership 9: Public Health Laboratory Sciences / Illinois Department of Health

## Background:

The Public Health Laboratory Sciences (PHLS) degree was initiated in August 2005 as a collaborative effort between the Illinois Department of Public Health (IDPH) and Southern Illinois University School of Medicine (SIU SOM). Academic training consists of graduate-level courses in the biological and analytical sciences which are delivered by faculty in the Molecular Biology, Microbiology and Biochemistry (MBMB) graduate program. Didactic course work is supplemented with extensive hands-on experience in 1 of 3 state Public Health laboratories located in Carbondale, Springfield and Chicago. Students also participate in "engagement projects" with colleagues in IDPH programs to increase awareness of the greater Illinois public health system. An intergovernmental agreement between SIU SOM and IDPH is in place. This agreement provides funding for 6 MS and 1 PhD student each year and is renewed every 3 years. Since 2005, there have been 27 MS degree graduates; 21 have positions in public health or clinical laboratories and 6 have gone on to pursue advanced degrees (PhD, MD, or DDS).

## **Opportunities for Growth:**

A PhD curriculum is planned to begin in fall 2020. Additional academic training would include courses in Epidemiology, Leadership, Administration and Biostatistics, which are available through the Department of Public Health and Recreations Professions graduate program at SIU-Carbondale. IDPH would like us to increase the number of PhD candidates from 1 to 3 so that each laboratory (Carbondale, Springfield and Chicago) has a student engaged in thesis research. PhD trained graduates would be poised to fill director-level positions which are in high demand in the US.

#### **Potential for ROI:**

An intergovernmental agreement between SIU SOM and IDPH is in place that provides funding for 6 MS and 1 PhD student each year and is renewed every 3 years. There is an expectation to increase MS trainees from 6 to 12 and PhD trainees from 1 to 3 over the next 3 years. As these students are trained in a public health laboratory and in accordance with CLIA standards, graduates are able to work in any public or private high-complexity laboratory. We have a record of 100% job placement and have established relationships with public laboratories in Texas, North Carolina, and Tennessee as well as private companies in Illinois and Wisconsin. Expanding these partnerships to other states would be highly beneficial.

#### **Timeline and Metrics:**

From the period 2020 - 2023 we have the following expectations: 1) expand our graduate program to 12 MS per year and 3 PhD students every 2 years; 2) graduate 12 MS students every 2 years and 3 PhD students every 4-5 years; 3) create opportunities for students to work with epidemiologists and biostatisticians in the public and private sector; 4) create a CLIA clinical testing facility on the SIU SOM campus for additional on-site training opportunities and outbreak assistance.

#### **Required Investments:**

Dr. Andy Wilber is the current director and academic advisor for the program. He delivers 4 academic courses and organizes/oversees all aspects of the laboratory training. At the current growth rate, we anticipate 12 new MS students per year and 3 new PhD students every 2 years for a total of 27 students over each 2 year period that is required to complete the MS degree requirements. Additional faculty support to include 2 full-time Assistant Professors, 1 instructor and 1 medical technologist with experience in Public Health, Epidemiology or clinical testing would be of great benefit to offset the teaching load. Creation of an on-site CLIA certified laboratory that is fully equipped with molecular and serology testing equipment would create an opportunity to train students and professionals as well as provide support to our public health and hospital colleagues in time of need such as the current viral outbreak. This laboratory would also be used to support ongoing SIU SOM clinical trials and serve as a platform to create training videos to provide public health and clinical laboratory professionals with on-line training opportunities for continuing education credit.

## Partnership 10: Health Care Management and Health Informatics

## Background:

The undergraduate Health Care Management (HCM) program has a minor in Health Informatics and Information Management (HIM) that has strong connection with Southern Illinois Healthcare (SIH) through use and collaboration of their EPIC electronic health records platform. This is a relatively new initiative and requires extensive work on the part of SIH each semester when they add each HCM student individually to their EPIC training modules. Furthermore, SIH provided EPIC training to each HCM faculty member and works to keep applicable faculty up to date on EPIC changes. The roll out of this partnership began with one HCM class which is now offering the EPIC training within the curriculum. The intention is to expand this access to approximately 4 HCM courses which are applicable to EPIC training modules when HCM faculty feel the "bugs" have been worked out of the initial implementation and as SIH's team is available for student entry into the EPIC platform.

Furthermore, there is an initiative at the undergraduate program level to align the HIM minor with certification requirements with the American Health Information Management Association (AHIMA). This will allow HCM graduates to sit for a variety of certification exams for specific credentialing in health information/coding. The knowledge that comes from these trainings sets the foundation into the approaches and applications of health informatics through the analysis of patient records which enables health care leaders and providers of care to make micro and macro level decisions for the purpose of improving patient care and health outcomes, as well as, business operations through the effective use of data.

At the graduate level, our Master's in Health Informatics (MHI) is relatively new. Collaboration with industry experts/leaders through the Community Advisory Board (CAB) has refined the (MHI) curriculum to be industry driven in terms of health informatics. Initial conversations with CAB members has led to focused areas involving artificial intelligence, big data, block chain, and interoperability as key areas where emphasis should be placed and where potential collaborations may exist.

#### **Opportunities for Growth:**

#### Internally

Given health informatics will undoubtedly lead improving patient care and health outcomes in likely every specialty, there are limitless opportunities for growth for the HCM and MHI degrees. Just even within our own School of Health Sciences there lies tremendous potential for further collaborations. Furthermore, expanding relationships with the School of Medicine, the Law School, and Quality Engineering and Management are possible and have been discussed. To support such growth, especially at the system level, a review of current policies associated with differing tuition fees and operational processes would be helpful since these may offer either real or perceived obstacles to progress. This has been encountered when exploring opportunities between SIU's JD program and the MHA.

#### Externally

The HCM and MHI programs have significant industry support but opportunities to expand these partnerships always exists. For example, faculty have expressed interest in becoming a research hub for healthcare organizations. The basic premise provides healthcare organizations to funnel their research projects to faculty, in concert with students, for research and analysis. Workloads and increased faculty to initiate and implement such an endeavor would be required. This could lead to increased connections for student internships/residencies, grant and research opportunities, and increased public outreach.

Furthermore, increased faculty involvement in local, state, and professional associations is pivotal. Again, workload issues impact faculty availability but also travel support and membership fees can present challenges.

Hosting annual meetings for relevant health informatics associations and research conferences would provide increased partnerships with other colleges/universities and health informatics professionals. Such collaboration would grow by allowing these stakeholder associations to save on their annual meeting (and other regularly-scheduled meetings) by having them held at public (SIU) institution campuses/locations. Often, the conference room/amenities are the highest of all annual expenses for these organizations. Partnering (at an increased level) with healthcare professional associations for their meetings and member networking events would offer a much cheaper (or free?) location for their meetings, already ready to handle several attendees, A/V requirements, and other meeting needs. It will also assist in the influence of collaboration among industry professionals and the current HIM students/etc. It needs to also be noted that these organization's memberships are low/hurting due to a variety of factors. Such collaboration would help to involve and instill the benefits of professional memberships to the younger generations (SIU students).

#### **Potential for ROI:**

Additional faculty, especially those with health informatics skills/degrees; travel fees, membership fees, and workload adjustments, would all have associated expenses. For example, faculty dedicated to just research would be helpful in moving us toward the goal of being a research hub. Keep in mind, the workload of most School of Health Sciences faculty which includes HCM and MHI, often have higher teaching workloads than many across campus so we are simply stretched too thin. Hosting professional events would have minimal expenses but would require marketing endeavors and staff dedicated to assuring the event is effectively and efficiently coordinated. Our program/school has already grown substantially through the addition of new programs, but the basic number of academic advisors and staff has not grown at the same rate. For most of this, the ROI involves intangible benefits through the inherent marketing brought to the SIU campus, the local businesses/community (catering, hotels, social event in the evening, etc), as well as the ability for current SIUC HIM/MHI students to market themselves and meet industry professionals, 'on their own turf.'

#### **Timeline and Metrics:**

If properly staffed, HCM and MHI could achieve most of the aforementioned goals in approximately 2 years. Identifying when goals have been met would include: new program collaborations and associated revenue/enrollment increase; notable increase in student residencies at the graduate level which typically translates into higher employability; number of completed research projects; and increased partnerships with local, state, and professional organizations.

#### **Required Investments:**

Evaluation of system issues which may impede growth at the University and System level is merely a committee review of those applicable. It does little good for Senate or Grad Council to review these policies when many on those bodies are from other colleges which aren't actively involved in program development at the level the School of Health Sciences has been. Therefore, the impact factor of policies could be minimized by those who do not have the same vested interests. For example, to provide educational parity (as required by HCM's accrediting body) it is increasingly important that the same faculty member teach the EPIC infused courses in both the face to face and online format. SIH cannot provide unlimited number of faculty training given the time intensity of such. We must limit it to a few select faculty but assure EACH student has the same access and opportunities regardless of format. However, online courses as part of a faculty member's normal workload are discouraged. We need to review ways to make online courses acceptable as part of one's normal workload as an organizational policy so we can advance the student learning experience, meet accreditation expectations, and solidify this industry partnership with EPIC training. This partnership provides our graduates with hands on exposure to EPIC as one of the foremost electronic health records platforms positioning us as a leader in health care education.

Other needs include plant/property/custodian support, A/V support, parking support, university marketing initiatives (especially online tools/resources), and administration to help coordinate the on-site meetings/events, additional faculty with health informatics skill/degrees, membership fees, travel monies, workload adjustments, additional staff.

# **SIUE PARTNERSHIPS**

# Partnership 1: Illinois Corn Growers Association/Illinois Corn Marketing Board (ICMB) and National Corn-to-Ethanol Research Center (NCERC)

<u>Background</u>: Over the past decade, ICMB has funded numerous NCERC research projects related to improving corn to ethanol processing, corn fiber converted to ethanol, and value added co-products from corn to ethanol production. The funding format includes sponsored projects, salaries for post-doctorates, graduate students and interns. The collaboration units include the Department of Chemistry at SIUE, and the Center for Fisheries, Aquaculture and Aquatic Sciences at SIUC. ICMB brings questions and challenges from corn farmers related to improve the business development of the corn to ethanol industry to NCERC, and expects NCERC to lead a scientific team to find out answers and pathways in a timely manner.

<u>Opportunities for Growth</u>: The production of corn from the Midwest provides a platform to reshape the fundamental correlation between food, fuel and feed in the U.S. Introducing newly developed science and technology to the corn ethanol industry is imperative, and the continuous financial support from ICMB is invaluable for NCERC's future growth.

One area NCERC has continuously excelled is connecting with other academic units from nearby states, and it is ICMB's intention to get other state corn grower associations to support NCERC research and utilize the innovative technology it has developed to apply in a wider geological region.

<u>Potential for ROI</u>: NCERC needs to stay connected with ICMB and respond quickly with high quality work for their technical requests. Through the projects with ICMB, NCERC should try to expand its partnership with more external units, including government laboratories and academic groups.

Results from the projects funded by ICMB have helped NCERC to attract more contractual funded projects, develop more publications with SIU collaborators, and served as preliminary data for NCERC to apply for large research grants from government.

<u>Timeline and Metrics</u>: ICMB is currently interested in sponsoring a few potential projects but requires matching funds. It would be beneficial if SIU could assist in providing the funds. The projects include: improve the quality of co-products from corn to ethanol production to feed layers; how do we improve ethanol yield through in situ fermentation; continue to monitor the risk factors in co-products.

<u>Required Investments</u>: NCERC is in need of graduate students to help to facilitate research projects.

# Partnership 2: Joint Bioenergy Institute (JBEI), Advanced Biofuels and Bioproducts Process Development Unit (ABPDU) of U.S. Department of Energy and National Corn-to-Ethanol Research Center (NCERC)

<u>Background</u>: Collaboration between NCERC and JBEI began in 2017. JBEI employs the most innovative technology from the U.S. Department of Energy in converting biomass to biofuels and bioproducts on a lab scale, and relies on ABPDU to scale up to an immediate size, with NCERC to lead commercialization. The collaboration units from SIU include the Department of Chemistry at SIUE and Agribusiness Economics at SIUC.

<u>Opportunities for Growth</u>: The collaboration with JBEI and ABPDU has helped with the debut of NCERC in the national arena, but more marketing of NCERC's scale up capabilities is needed This need is pertinent in coastal areas with a high number of biotech companies in order to attract more business partners.

In the past year, NCERC has collaborated with JBEI and ABPDU on numerous proposals, and some of them were not funded by the government. However, the research ideas presented in those proposals are very attractive to industry. For example, to convert food waste from municipal solid waste to make aviation fuel and aquafeed already drew attention from industry, but NCERC and its collaborators are short of funding to initiate the lab work. Any support from the SIU system on innovative ideas will be invaluable to build the program and to attract more funding.

<u>Potential for ROI</u>: NCERC needs to reach out to government offices to demonstrate the strong collaboration between NCERC and JBEI, in order to get more government funding. NCERC has worked diligently in the past to visit the government offices in Washington D.C., to present its capabilities and potential to connect government labs, academia and industry. Any funded work will help NCERC attract more contractual projects, and help improve its visibility nationally.

<u>Timeline and Metrics</u>: NCERC has proposals pending. If not funded, some of the great ideas are worth being funded by SIU to continue development.

<u>Required Investments</u>: NCERC is in need of graduate students, especially Ph.D level, in order to help facilitate research projects.

# Partnership 3: Shimadzu Innovation Laboratory at SIUE (SILS) Partnership Overview

<u>Background</u>: Led by the National Corn-to-Ethanol Research Center and the Department of Chemistry at SIUE, the Shimadzu Innovation Laboratory at SIUE (SILS) offers strong opportunities for SIUE students, researchers, and the community. Developed through Shimadzu's Partnership for Academic Research and Quality of Life (SPARQ) program, SILS helps ensure that research, teaching and training are carried out on state-of-the-art instrumentation, which helps exceptional research institutes attract and retain the best students, faculty and staff, and produce highly skilled scientists. These partnerships are a win-win for both the University and the corporate partner. SILS extends SIUE's successful history of R&D partnership in the growing bioeconomy through enhanced analytical and technological capabilities, and by growing the team to include additional faculty and departments at SIUE. SILS focuses on big picture, high visibility research, with interdisciplinary themes such as food, energy, and water leading to joint grant proposals, publications, research presentations, and intellectual property.

In the first year and a half of operations, SILS researchers achieved:

- LC-MS/MS 8050 and GC-MS 2020 in place
- Current discussion with Shimadzu on placement of future instruments for method development
- Two active funded projects sponsored by ICMB and USDA
- Used for credit course for over 80 undergraduate students (CHEM 435)
- One graduate thesis complete using the LC-MS/MS 8050 and another one is underway.
- Dr. Tucker as a certified trainer enabling the Shimadzu Innovation Lab to offer Shimadzu Certified training.
- \$100,000 EPA grant received using instrument time match from the SPARQ lab.
- \$680,000 USDA grant received leveraging SPARQ lab resources

Meetings and Publications

- Fuel Ethanol Lab Conference 2018 mini symposium: six presentations (three from NCERC, 2 from SIUE Chemistry Department and one from Shimadzu) on lab testing related to quantification of corn to ethanol processing
- 2019 Pittsburg Conference presentation by Dr. Tucker
- Manuscript in preparation: starch method development and validation in corn matrix samples

<u>Opportunities for Growth</u>: The SILS partnership offers opportunities for growth through both the expansion of the existing lab as well as a model for other public-private industry partnerships. With capital support for additional instruments, the System could benefit from state-of-the-art analytical and mass spectrometry resources for interdisciplinary research projects.

<u>Potential for ROI</u>: As illustrated by the accomplishments in Phase I, the SIUE/Shimadzu partnership offers high potential for return in:

- Expanded research infrastructure

- Experiential and hands-on research opportunities for undergraduates and graduate students
- Employment and internship opportunities for students
- External grant and contractual funding
- Access to industry expertise, resources, and support for external projects

## Timeline and Metrics:

The SPARQ Phase II expansion will require \$2.5M in direct funding for instruments, which will be leveraged through the SPARQ partnership for research support. The second phase of SPARQ funding is anticipated within 12 to 18 months through external grant applications and contractual services. Metrics for success could be measured by:

Research Outcomes:

- Number of projects
- Number of grants submitted
- Number of grants/contracts awarded
- New patents, spinoffs, intellectual property

Student Engagement Outcomes:

- Graduate Assistantships
- Student Internships (On-Site)
- Student Internships (On-Site at Shimadzu)
- Undergraduate Researchers
- Graduate Researchers (non-GA)

#### Required Investments:

- Equipment purchases
- Space renovation at BLI
- New faculty or faculty time for research projects
- Graduate assistants
- Lab manager

## Partnership 4: SIUE School of Business Accelerated Online MBA and Academic Partnerships

<u>Background</u>: The SIUE School of Business, in partnership with Academic Partnerships, launched a 100% Online MBA in January 2019. Since that time, enrollments have grown. Academic Partnerships provides all marketing, inquiry generation, and retention services to the students. Since the launch of the Online MBA program, total MBA enrollments (including our existing Flex MBA program) have grown by about 230%.

<u>Opportunities for Growth</u>: In Fall 2020, we hope to launch a Healthcare Administration specialization as part of the Online MBA. Potential growth could occur with additional specializations to the MBA or moving additional graduate programs to an online format.

<u>Potential for ROI</u>: As additional students enroll in the program, increased revenue will occur.

<u>Timeline and Metrics</u>: Within five years of the launch of the Online MBA program, the goal of the School of Business is to have 500 students enrolled across both MBA program formats (online and flex). Currently, we have about 330 students enrolled in our MBA program.

<u>Required Investments</u>: No upfront investments are needed. The partnership is such that Academic Partnerships shares revenues but incurs upfront investments (marketing, etc.). As the program grows, the revenue streams will need to support a few additional faculty hires in the School of Business.

# Partnership 5: School of Business Executive Education and Scott AFB Training Programs (This is not an ongoing contractual partnership with SAFB)

<u>Background</u>: Currently, the SIUE School of Business Executive Education program provides a variety of training programs to USTRANSCOM, AMC, and SDDC at Scott Air Force Base. This training is provided on SAFB and on SIUE campus. We have been providing these programs for several years and they continue to expand and evolve. There is no formal partnership agreement as we are selected each year to provide training to them. We do not believe that SAFB can enter into multiyear agreements for these types of programs. We compete against other organizations and universities to secure this training. This is a revenue generating program for us.

<u>Opportunities for Growth</u>: The units at SAFB continue to inquire about additional programs that can be held for them. With system support of access to computer and conferencing classrooms, we would be able to significantly expand our programs to them. Often, we are only able to accommodate technical training on Fridays. Access to larger computer classrooms with more seats and options to reserve rooms throughout the week would provide an opportunity for growth. In addition, we could us additional faculty resources to teach some of the programs.

<u>Potential for ROI</u>: All of our current training programs generate positive net revenues. With increased access to classrooms, we could increase our offerings to SAFB.

<u>Timeline and Metrics</u>: If access to more classrooms were made available, we could experience significantly increased revenues within the next year and into the future.

<u>Required Investments</u>: SAFB typically requests programs with only 3-6 months notice. If classroom capacity could be increased so we can meet their demand, our programs could be increased resulting in significant additional revenue for the School. Therefore, a dedicated training facility that houses a large computer lab and classroom would be assist us in achieving a better partnership with SAFB.

# Partnership 6: Living Architecture Regional Center of Excellence (LARCE)

<u>Background</u>: Green Roofs for Healthy Cities and its charitable arm, the Green Infrastructure Foundation, recognized the national leadership of SIUE's Green Roof Environmental Evaluation Network (<u>G.R.E.E.N.</u>) in 2018 by naming it a Living Architecture Regional Center of Excellence, one of only four in the U.S. Led by Drs. Bill Retzlaff (distinguished research professor of biological sciences and associate dean in the College of Arts and Sciences), Susan Morgan, P.E. (professor of civil engineering and associate dean in the Graduate School), and Serdar Celik (professor of mechanical engineering), G.R.E.E.N. formed in 2004 as a St. Louis metropolitan area research collaboration between SIUE and regional and local industries. It has since expanded <u>to include partners</u> from across SIUE, at other higher education institutions, as well as from companies and trade organizations across the U.S. A broad array of <u>research</u> has been conducted using various sites at SIUE, and two <u>symposia</u> have been held.

<u>Opportunities for Growth</u>: Green infrastructure is increasingly being used by developers and is promoted heavily by governmental organizations. Due to the use of plants in green infrastructure and their dependence on local conditions, local research is needed to support its acceptance and implementation. Partnerships with industry, trade organizations, and government bodies provide opportunities to obtain funding to support research. Additional research and learning opportunities in green infrastructure will attract students who would be well placed for job opportunities within industry and government.

Potential for ROI: Since 2004, SIUE living research laboratories have resulted in 18 externally funded research awards (~\$455,000 in external funds and donated materials), 27 funded student research projects (~\$44,000), 24 MS theses, and numerous publications and presentations regionally, nationally, and internationally. With increased dedicated time, G.R.E.E.N. would be expected to increase grants and contracts substantially as much of the infrastructure and many collaborations are in place already. The increased grants and contracts would also result in additional opportunities for undergraduate and graduate students to participate in research projects as well as be supported by the external funding.

<u>Timeline and Metrics</u>: With additional time dedicated to G.RE.E.N., it is expected that within 2 to 3 years a substantial increase in externally funded proposals and awards as well as in-kind donations would be achieved. Each project would be used to support one or more students.

<u>Required Investments</u>: University and/or system support is sought (1) to provide access to the Engineering Building green roof and (2) to provide for the basic maintenance of existing green infrastructure established previously on campus. The original Engineering Building green roof research site is no longer accessible due to changes in federal safety requirements. An access door through an existing small room would allow this roof to be accessible again for research. Currently, G.R.E.E.N. faculty and students are relied upon to maintain campus green roofs, even those which were installed as part of building construction; this maintenance can take away from time for new research. A third, larger, investment in a part-time director position would provide a person to lead efforts to seek external funding and to create larger collaborations to

seek funding. Assuming 9 months of support at \$5,000 per month for ~50% time, the cost would be \$45,000.

# Partnership 7: Numerous Additional Opportunities with Pilot Plant Upgrade (Environmental Resources Training Center – ERTC)

<u>Background</u>: The ERTC has discussed with external parties (American Water, MSD, IEPA, and IRWA) and internal parties (School of Engineering, Department of Chemistry) about conducting research at the ERTC Pilot Plant. The issue is that the Pilot Plant has a single treatment train that needs to be utilized for the hands-on portion of the one-year program. This limits the availability of the Pilot Plant for research opportunities to the summer or forces the researcher to sample based on ERTC operations rather than controlling operations themselves. The addition of a new treatment train would allow it to be used solely for research purposes.

<u>Opportunities for Growth</u>: This enhancement would provide growth in collaboration both internally and externally. It also may facilitate new relationships since a treatment train in a controlled environment would be intriguing to anyone conduction research or studies.

<u>Potential for ROI</u>: ROI from internal partners would be non-monetary and would consist of student education through conducting research. ROI from external partners would operate as fees for service. Additional grant opportunities may also be available if governmental entities are interested in utilizing the treatment train for research/studies.

<u>Timeline and Metrics</u>: The next IEPA interagency agreement proposal will be completed in the summer of 2021. A request could be made for funds to help with the effort. It will be difficult to secure funds for the entire project through IEPA so additional grants should be entertained. The metrics would depend on the projects being run and how many parties would utilize the enhancement. The Dean of Engineering has already expressed interest in the ERTC's recent six-year center review.

<u>Required Investments</u>: Additional building space for the new treatment train, pumps to provide water from SIUE WWTP or Cougar Lake, water/wastewater tanks, water/wastewater treatment units, water/wastewater continuous monitor and flow meters.

# Partnership 8: Center for Predictive Analytics (C-PAN) Future Partnerships

**Partnership Type A**: Continued and growing work with current, long-term external academic partners.

# Background:

So far, we have partnerships with the Donald Danforth Plant Science Center (<u>https://www.danforthcenter.org/our-work/principal-investigators/christopher-topp/?gclid=Cj0KCQjw-</u>

r71BRDuARIsAB7i QO5Z4DPJznoKAVGWb36DrqgP035nkWi7Hj2JMtm1ChIItjbLzKOjVQaAj54EAL w wcB), the Computer Science Department at Washington University in St. Louis (this is in its infancy) multiple departments at Illinois State University (some of these are also in their infancy), the Center for Digital Agriculture (https://digitalag.illinois.edu/) and the National Center for Supercomputing Applications (http://www.ncsa.illinois.edu/) at the University of Illinois at Urbana-Champaign and the Department of Crop Sciences at the University of Illinois at Urbana-Champaign (https://cropsciences.illinois.edu/research/). Some of these partnerships are in their infancy, and require the successful completion of deliverables in a timely fashion to build rapport and continued partnership. I would also like to establish partnerships with many other units at Washington University in St. Louis (particularly in the medical and scientific realm), and with In all cases, either proposals have been submitted, funded, or are being planned with each of these entities.

# **Opportunities for Growth and ROI:**

In this external partnership type, opportunities for growth would include the ability to pursue additional external funding opportunities through federal grants, greater recognition through publications, and the training of students in experiential learning environments.

# <u>Timeline:</u>

There is no set timeline, as every individual and therefore every partnership is different. Generally speaking, though, within 18 months, an initial proposal should be collaboratively submitted. Within 36 months, you hope that 12.5-25% of those proposals are funded, depending on the agency and funding rates. Depending on the level of investiture of the SIU system, the timeline and metrics could change. For instance, if the SIU system only provides minimal support, I cannot sustainably devote time to the pursuit of grants and academic collaborative opportunities. In this lesser scenario, I must instead devote my time to finding high turnover, quick profit contracts to support the Center I direct. As another example, if I do not have the appropriate computational resources, this severely limits what resources and collaborative expertise I can offer. In these lesser-funded instances, the number of external grants that we can pursue is severely limited. On the other end of the spectrum, if I had a fully funded core Center staff (myself, one administrative staff member, and a research associate/technician), if our ITS and pre-award offices had ample support (I have no idea how they both get done with as much as they do, they are amazing), and I had access to high powered computational equipment, then this makes my time more flexible and enables the Center to pursue a greater number and diversity of grand funding opportunities. Within 3 years
of receiving funding, usually this means that a minimum of two students and one publication have been produced, although, depending on the project, it could be as much as 100 students and 4-5 publications. The metrics really are quite variable, even within our own Center and even with each collaborative partner. Generally speaking, though, you hope to see grants pursued, a proportion of those grants being funded, students being trained through experiential opportunities, presentations being given at national or international conferences, and at least a publication per project submitted.

## Required Investments:

In general, I need fully supported core Center staff (myself/director, an administrative assistant, and a research assistant/technical personnel); up-to-date computer equipment; technology enabled facilities for holding workshops, conferences, etc.; ample pre-award and post-award staff in ORP (they are stretched a bit thin!); research-focused marketing resources

#### Partnership Type B: Short-term contractual agreements

#### **Background:**

These partnerships, such as those named in list items 1 (e) through (g), are opportunistic partnerships. These vary across many industries and may or may not generate more work in the future, but they are also simple and quick ROIs.

#### **Opportunities for Growth and ROI:**

With more support in terms of staffing, research infrastructure, and computational resources, there are more contractual services that we can offer.

#### Timeline and Metrics:

Variable. Depends on services that can be offered, staff support, etc. Right now, if I help bring in 2-3 contracts per year at \$15,000 each or more, that's enough for me to support 2-3 students. For instance, if I had infrastructure support but not staff support, I might focus more on contracts; but, if the opposite were true, I might focus more on grants because I would still be limited in what services I could offer. If both sources of institutional support were available, the Center could hypothetically pursue both grants and external contracts in greater quantity, since administrative and technical staff would be present to help process the contractual documents and complete the work. Short-term contractual agreements often vary from year-to-year. For instance, in a good economy, contract opportunities are plentiful; in a bad economy, most industries and partners try to keep everything internal. Oftentimes, the contracts are completed in less than 10 weeks, although some can be as long as two years (or longer).

## Required Investments

Please see above.

## Partnership Type C: Long-term industry contracts

#### **Background:**

Being a new Center, we have a minimal number of industry contracts. Those that we do have, we are working with on a probationary basis. We would like to establish more industry partnerships to (1) be able to have an additional source of external funding, and (2) be able to better place our students upon graduation.

## **Opportunities for Growth and ROI:**

There are a number of industries that are in need of data analysts in the St. Louis area. This could result in increased revenue through more external contracts, increased student placement directly after graduation, and increased student enrollment due to perceived benefit of higher rate of industry placement upon graduation. This also potentially results in increased economic activity for the companies in the metropolitan area, as they receive a beneficial service at a fraction of the cost and also do not have to spend as much time training new employees.

#### Timeline and Metrics:

It is very difficult to say at this time due to the challenges presented by COVID-19. Under normal circumstances, it can take 2-3 years for these types of contracts to amount to much.

## Required Investments:

Please see above.

## Partnership Type D: Long-term government and non-profit organizations

## Background:

So far, many of these organizations have needed data analysts, but at minimal budgets. These are excellent opportunities for our students to learn more about data analysis and their communities, and for us to also make a positive impact in our communities. At the end of the day, these relationships are win-wins, even though there often isn't much money involved.

## **Opportunities for Growth and ROI:**

These relationships are a great way for our students to receive real-world experience analyzing complex data. These experiences make our students more employable while also improving the community and economic vitality of the St. Louis Metro. It also enables our institution to pursue a diversity of grant opportunities, as there are some funding opportunities that need community partners.

## Timeline and Metrics:

Very variable, depends from one year to the next. Sometimes, if you get a grant as a collaborator with a governmental institution, that's a great achievement. Other times, it means having access to data and performing an analysis that you otherwise could not have done without paying an outrageous fee. Sometimes, it means successfully placing a student in a career because of the experiences they gained. Other times, the work attracted the attention of a donor, and they provided support for the continued research in these areas. Sometimes, the

work provides preliminary research for externally funded studies which, otherwise, could not be pursued. In general, though, these types of projects should lead to a community presentation, recognition by the larger community, and the pursuit of a larger project within 24-36 months of initiation.

Required Investments: Please see above.

# Partnership 9: Bayer Crop Science and (Laboratory for Spatial Analysis) LASA

<u>Background</u>: LASA has been working with Bayer Crop Science (historically Monsanto) for the past 23 years. They have funded close to a million dollars of research over this time period with \$125,000 gifted to LASA within the last 12 months. LASA is currently involved in research with Bayer in both St. Louis and in Germany. Some of this agricultural research involves working with researchers at other academic institutions (University of Wisconsin-Madison, University of Missouri at Columbia and Auburn University) to model and predict herbicide drift. Additionally, in the last year, LASA has created a relationship with the Bayer Crop Science division in Germany through research involving computer modeling and mapping of changes in grassland quality (and its impact on measured insect decline). Through this project, LASA has begun integrating SIUE's Center for Predictive Analysis (CPAN) to aid in time-series analysis and statistical modeling.

Opportunities for Growth: The relationship that LASA has with Bayer has been centered around remote sensing and image processing of satellite, aircraft, and drone imagery. LASA's expertise in extracting information from these remotely sensed data sources has provided Bayer with a valuable resource for understanding factors affecting the agricultural / environmental interface. One limitation that LASA has with growing this partnership is our limited resources with respect to new imaging technology. The vast majority of LASA's external funding goes to paying fulltime employee's salaries, fringe benefits, overhead (ICR), and overall operating costs (computers, phones, data jacks, continuing education in technology, conferences, office supplies, and travel). There is very little left over to spend on staying at the forefront with respect to advanced imaging and drone technology such as hyperspectral drone systems or handheld spectroradiometers (both of which can run upwards of \$100,000 each). LASA (which exists primarily on soft money) does not have the resources to compete with the larger universities. While LASA certainly has the proximity to Bayer (and important internal contacts), with system support, LASA could quickly become the primary remote sensing research arm of Bayer. In fact, LASA has recently completed two projects with Applied Analysis Solutions and Bayer Germany on historic land use change assessment. And, within the last month, LASA was contacted by Bayer Brazil with interest in future agricultural research.

<u>Potential for ROI</u>: There are several avenues for ROI with Bayer. First, there is potential for a long-term revenue stream from a relationship with them. Second, is the funding of graduate and undergraduate students through their funded research. Third, is the potential for jobs for our graduates. LASA has a number of past graduate assistants who received employment with Bayer and its subsidiary Climate Corporation.

## Timeline and Metrics:

1: Increased annual funding – within the next 24 months, LASA could make huge strides in becoming one of Bayer's primary research and development assets for remote sensing and agricultural mapping. There is a need for research using the latest advanced technology in remote sensing (multispectral drone, hyperspectral drones, thermal sensors, FLIR system, and LIDAR systems).

2. Increased student involvement – within 12 months, LASA could fund more students (graduate and undergraduate) through research related to Bayer's remote sensing needs. This increase in research dollars would scientifically increase LASA's ability to fund more graduate assistantships and hire more undergraduate student workers. These assistantships (and student worker positions) are highly competitive as they provide students with valuable research experience in the field of remote sensing and GIS. Additionally, LASA is frequently contacted by companies (both locally and nationally) requesting a pool of applicants for job positions in GIS and remote sensing.

3. More exposure through publications and presentations: LASA recently made a joint presentation of research findings with Bayer at the Weed Science Society of America Annual Meeting. More research is planned this summer with the expectation of results to be presented/published in winter 2020-2021. Additionally, Bayer Germany has expressed significant interest in co-publishing LASA's recent research on grassland management related to insect decline.

## Required Investments:

- 1. Funding for advanced technology
  - a. high level multi-spectral drone, hyper-spectral drones, drone with thermal sensor, and drone with LIDAR system all with precision GPS.
  - b. High end laptops for processing the drone imagery on-site.
  - c. Spectroradiometer and other handheld sensors for field collection of ground data.

## 2. Personnel

a. At this time, LASA is stretched very thin on personnel. It takes money to hire employees, and it takes trained personnel to get the work done properly and on time. It is very difficult to grow a research lab primarily on soft money. Growing a powerful research and development group requires the hiring and training of personnel, along with consistent cash flow from external sources. But it is difficult to obtain one without the other. Hence, the need for some sort of internal funding for hiring and training key personnel. This is an impediment to us committing to more external research.

# Partnership 10: Illinois Department of Natural Resources (Abandoned Mines Reclamation) and (Laboratory for Spatial Analysis) LASA

<u>Background</u>: IDNR has funded LASA with over 6 million dollars in the last 20 years to address underground mine related subsidence issues. This includes the scanning and georeferencing of over 10,000 underground abandoned mine maps, building a GIS-based website for displaying historic mine maps, and performing site location subsidence monitoring surveys when a mine collapse occurs.

<u>Opportunities for Growth</u>: In addition to the mine map archival project, IDNR funds an annual contract to monitor and survey mine subsidence events (Subsidence Monitoring Response Team). This contract funds annually 10 or more student workers. However, the funding from the IDNR cannot be used for research. Therefore, all new ideas for mapping and surveying must be explored with internal resources. There is a great deal of digital automation that could be introduced into the surveying contract; however, we do not have a budget to experiment with new and innovative methods to automate their data collection and mapping.

<u>Potential for ROI</u>: The funding for much of this contract could fade away if we do not find ways to help IDNR become more efficient at data gathering. So, the ROI is more related to maintaining the existing partnership. This relationship has funded the majority of our graduate and undergraduate students over the last 20 years.

## Timeline and Metrics:

1: Research funding to automate existing survey methods – within the next 24 months, LASA could make huge strides in automating the collection of subsidence events across the state. This would be a major step in continuing the contract which funds both undergraduate and graduate students.

# Required Investments:

- 1. Funding for advanced GIS and mapping technology digital automation.
- Funding for Advanced GIS-based Programming & Training While LASA has developed an advanced website for querying/displaying archived georeferenced mine maps, keeping up with the GIS technology (hardware and software) is becoming very time consuming and expensive. This requires continued training and conference/workshop attendance.

# Partnership 11: SIEMENS and National Corn to Ethanol Research Center (NCERC)

<u>Background</u>: The collaboration with SIEMENS started with the initial donation of a DCS (Distributed Control System) to NCERC over a decade ago. The partnership was rooted to be a showcase for their flagship process control product, PCS7. With the partnership comes discounted rates on products, services and education. Outside of the official agreement, our local SIEMENS contacts have gone above and beyond in many cases. Hand delivering and donating essential parts that have failed so that NCERC can get back up in running in the quickest fashion. SIEMENS also helped develop a tailored simulated control system that mirrors many operations of our own Pilot Plant.

<u>Opportunities for Growth</u>: Currently we have more technological assets than we effectively utilize. Most of that technology has been acquired for the purpose of training. Training NCERC staff, students enrolled in the Lewis and Clark Community College Process Technology program, and engineers of varying disciplines at SIUE. Focusing on building more structured and robust training exhibitions and curriculums would offer stronger personnel for NCERC, strengthen our relationship with Lewis and Clark, and give our own engineers an opportunity to have direct, hands-on experience with many technologies that they may meet throughout their careers. SIEMENS has inquired about utilizing our facilities for their new hire training as well. Many ambitious SIUE School of Business students would likely appreciate the opportunity to forge and implement their own ideas on how to structure the sale of a certificate program.

<u>Potential for ROI</u>: While we believe having more technically equipped personnel and turning out real-world competent students can have a large indirect return, short, two or four-day training courses have the potential for lucrative margins, especially given that most of the upfront capital has been acquired. SIEMENS showing interest in our facility as a training ground is a demonstration of a need in industry as well.

<u>Timeline and Metrics</u>: In this unique time, NCERC has been able to focus on building training materials. It has demonstrated that NCERC can be fairly well positioned in a short amount of time. However, when things lift and business is as it was, we do not have the personnel to continue at our current rate.

<u>Required Investments</u>: Most of the foreseeable capital has been acquired and having the continued guidance and insight from our engineering professors would prove invaluable.

# Partnership 12: Bachelor of Liberal Studies - Medical Technology Corporate Partnership Program

Background: The Bachelor of Liberal Studies began a Corporate Partnership with BJC Healthcare and Gateway Regional Medical Center in August 2019. This program is housed in the College of Arts and Sciences. Coursework from multiple disciplines (Applied Communication Studies, Biological Sciences, Chemistry, English Language and Literature, Mass Communications, Philosophy, Sociology, and Theater and Dance) allows for students to meet the requirements of the degree program. There are currently 18 students in the program between the two medical facilities. The Office of Educational Outreach has facilitated the conversations between the corporate partners and the College of Arts and Sciences to get the Bachelor of Liberal Studies -Medical Technology program up and running.

<u>Opportunities for Growth:</u> From support at the system level, developing connections with hospital systems throughout Southern Illinois would allow for potential increase in corporate partners, as well as the enrollment in the academic program. The connections made with other hospital systems in the region would offer an opportunity for their Medical Laboratory Technician employees to pursue this program and allow for advancement in their career.

<u>Potential for ROI</u>: Should further corporate partners be developed for this program, SIUE would see the potential for a monetary ROI of between \$6,000-\$13,200 each year of new revenue for each new student that enrolls in this program. The non-monetary ROI would be the ability for the hospitals to promote their employees from being a Medical Laboratory Technician to a Medical Laboratory Scientist or to a Technologist in a specialized area (Blood Banking, Chemistry, Cytogenetics, Hematology, Molecular Biology, or Histotechnologist).

Timeline and Metrics: Over the next 3-5 years, the following goals for the program are -

- Gain 1-2 new corporate partners within the region that have Medical Laboratory Technician employees wanting a pathway to be promoted to a Medical Laboratory Scientist
- 2. Increase enrollment to 30 students in the program at one time through the current and new corporate partners

3. Graduate at least 5 students per year through the corporate partnership program <u>Required Investments</u>: The following items would be needed for the goals of the program –

- Academic Advisor One person devoted to this program to build the relationships with the corporate partners and its Medical Laboratory Technician employees. This person would perform similar duties as the Academic Advisor for the Online Degree Completion programs within the College of Arts and Sciences. The person in the position would need to have experience working with external partners and developing positive relationships with the hospital systems and students.
- 2. Office Space This person would need to have office space within the College of Arts and Sciences Advisement unit.

- 3. Equipment This person would need to have the standard office equipment in order to perform the duties and functions of this position.
- 4. Professional Development This person would need to be able to network with other individuals doing similar work at other colleges/universities. Therefore, memberships in professional associations and attendance at professional conferences would be a vital part to allow for networking.

## Partnership 13: Community Organization Exhibition and Outreach Program - University Museum currently with Edwardsville Arts Centre (EAC), Fuller Dome Center for Spirituality and Sustainability (CSS), Meridian Village Senior Living Community (MV))

<u>Background</u>: The University Museum (UM) curates and mounts an annual exhibit of museum artifacts with programming at the EAC, an independent non-profit gallery and arts education center located on the grounds of Edwardsville High School. This annual exhibit (established in 2012) provides an opportunity for the UM staff, museum graduate assistants and museum studies students to connect with and provide artifact exhibition and educational programming for the local K-12 students and teachers and the Edwardsville and Metro-East art community. Related to this, faculty from the SIUE Art & Design dept. (A&D) serve on the EAC Board. A&D faculty often curate exhibitions and SIUE faculty, students and alumni regularly exhibit the products of their artistic research practice in the gallery, shop and at the EAC annual Art Fair. An A&D graduate serves as the EAC gallery manager and multiple graduates teach courses in their public class offerings. <u>https://edwardsvilleartscenter.com/ and TheIntelligencer.com/Eighth</u> graders see history in art

Additional exhibition and outreach projects have been initiated with the CSS (established in 2018) and the MV (established in 2018). The CSS's Fuller Dome Gallery is a joint project initiated by the CSS and the UM via funding from a Meridian Society grant in 2018. The goal of the partnership is to utilize UM cultural heritage artifacts and expertise to support the entities' dual missions of education and community outreach through exhibitions and attendant programming for the CSS and SIUE communities as well as local K-12 and adult audiences. http://www.fullerdome.org/gallery-inauguration. The MV exhibition in 2018 was initiated through a joint project with Dr. Laura Fowler and the Museum Studies students in HIST582. SIUE students curated and mounted the exhibit and provided programming for the senior community's residents. Meridian Village Residents Enjoy Museum Experience

Opportunities for Growth: The component of the partnership with these partners (and future partners) that needs growth and support is strengthening the educational connections between the local community and its K-12 population and the culturally diverse programming that the UM can provide through exhibition of artifacts. The UM's collections are a vastly underutilized cultural heritage asset. Many of the state's comparable university museums have public education programs and staff who work on site at their campus museums as well as in the community. Growing this component of museum education would require coordination between the Anthropology dept., the A&D dept., the History dept. (which are already engaged with the UM) and the School of Education (SEB). At minimum, funding for a museum educator/curator would be essential. This position could coordinate exhibits, create programming, facilitate outreach, seek external funding, and create curricular/instructional opportunities for undergraduates and graduates in the areas of art education, museum studies, anthropology, and related majors. With a museum educator/curator in place the UM would be positioned to reach beyond these venues and coordinate programming directly with K-12 sites expanding non-formal learning. It would also be possible to promote on-campus museum education options, encouraging visitors to the campus and an increased public presence for the

UM and SIUE. Supporting the expansion of community outreach would also suggest the hiring of a museum collections registrar/manager staff position. The record keeping, tracking and care of the UM's collection of more than 32,000 items is currently understaffed and an increase in programming activity would overwhelm the UM's systems.

Potential for ROI: The formula for ROI for investments in the UM's partnerships in cultural heritage exhibitions and education relies on a combination of factors. Museum outreach activities can be attached to curricular goals for students from SEB, Anthropology, History and A&D and staffed by students and graduate assistants doing supervised hands-on job training in the museum exhibition and education sector (student education, workforce training). An expansion of the current program by adding staff would support the UM in applying for grants for programming and scholarship in the cultural heritage sector (federal: NEH and IMLS, state: IAC, and private foundations) supporting community and university goals in education and high impact community engagement projects. In a less tangible but no less important way the expansion, vision, and values. Artifacts of cultural heritage can express diversity, scholarship, and history; object-based research exhibitions and programming can often go further than words in convincing the public and the campus community of the importance and vitality of the University's values, goals, and achievements.

Community Organization Exhibition and Outreach Program							
Goal	2021 Target	2022 Target	2023 Target	Results			
Staff Community Outreach program	Hire Museum Educator/Curato r Hire Collections Registrar/Manag er (50%)						
Deliver expanded Community Outreach programming	Survey community constituents, connect to K-12 admin, develop plan, maintain current exhibition schedule Review and manage records, collections	Develop plan and engage K-12 institutions with programming, onsite and at SIUE Manage loans and insurance, condition documentation, collections inventory	Research and engage additional community public and private venues for exhibition and programming. Manage loans and insurance, condition documentation, collections	6 dedicated museum exhibitions and programs per annum (reaching 100s of K-12 students), collections tracking and record keeping managed and objects insured			

## Timeline and Metrics:

Coordinated curricular components	Research and identify majors, departments and existing curricula	Museum educator works with SEB and CAS depts to develop curricular projects and opportunities for students	In coordination with museum educator students work via projects and internships engaged with UM's cultural objects to create curricula and programming	SEB and CAS student led programs (2 per term, 6 per annum) (reaching 15-20 students per term) plus individual internships/gradua te assistantships (1 per term)
Grant funding to support programming / infrastructur e	Assess museum education, research granting agencies, organize statistics and identify needs	Apply for programmatic support	Apply for programmatic support	Grant funds cover Museum educator salary after year two, half of Collections Manager salary

Required Investments:

- Museum Educator staff/faculty position
- Museum Collections Registrar/Manager (50% time)