

## Office of Research Development and Administration Award Report July 2017

\$1,329,829 Dan Bonenberger, Geography & Geology Wheeling Historic Landmarks Commission (\$12,000) Early Dwellings of North Wheeling Intensive Survey: North Wheeling is famous for its late Victorian architecture, yet its concentration of earlier, mid-nineteenth century dwellings is greater than any other neighborhood in Wheeling, potentially surpassing that of any other town in the state of West Virginia. These houses link the city with the most important events in its history: the arrival of the National Road terminus, industrialization, statehood movement, and the Civil War. Unfortunately, this collection of buildings remains hidden in plain sight, for while the age and history of a few of the earliest houses are known, many more remain intact but undocumented beneath a layer of later nineteenth century stylistic accretions or encapsulated in later additions that masquerade their age and importance. The EMU team's expertise in historical Geographic Information System (HGIS), vernacular architecture, architectural field surveys, and local archival research will bring these hidden treasures to light. The earliest dwellings in the neighborhood will be identified, researched, and described in detail using the WVHPIF following state and federal best-practices. A survey report will evaluate the significance of these buildings in the context of local, regional and national developments, and make recommendations for future recording, designation, and management options. Stephanie Casey & Andrew Ross, Mathematics National Science Foundation (\$264,941) Collaborative Research: Mathematics of Doing, Understanding, Learning, and Educating for Secondary Schools: MODULE(S2) aims to improve preservice secondary mathematics teachers' mathematical knowledge for teaching with a three-pronged approach: (1) refine and expand instructional modules which improved preservice secondary teachers' MKT in pilot trials; (2) promote effective instruction by university faculty using these modules; and (3) investigate the impact of use of instructional modules and faculty quality of instruction on preservice teachers, so as to inform subsequent efforts in teacher education. This five year project will build on efforts by the Mathematics Teacher Education Partnership (MTE-P) to create a gold standard for preparation for secondary teaching. Using a Networked Improvement Community Model of design, three teams coordinate on the MODULE(S2) effort: (1) writing teams in four content areas (algebra, statistics, geometry and modeling) will expand, refine, and disseminate instructional modules and support materials for faculty; (2) the professional development (PD) team will develop and conduct activities to support faculty using the modules; (3) the research team will provide empirically-based insight into effective instructional practices to develop preservice secondary mathematics teachers' mathematical knowledge for teaching. Anne Casper, Biology National Institutes of Health (\$441,000) Complex Genomic Rearrangements by BIR and mmBIR: When the process of copying a cell's DNA is stalled or damaged, human cells can use a break-induced replication (BIR)-like mechanism for repair. However, BIR can cause the loss of genetic information and promote tumorigenesis. A related, more error-prone repair pathway, called microhomology-mediated break-induced replication (mmBIR), has been implicated in generating complex duplications and deletions in DNA, both in tumors and in copy number variations (CNVs). This proposal uses the yeast model system to investigate BIR and mmBIR. Our results will help explain how complex rearrangements form in tumors and CNVs and may suggest how the BIR and mmBIR mechanisms could be therapeutically targeted. Claudia Drossel & Alexandros Maragakis, Psychology Michigan Health Endowment Fund (\$391,098) EMU Geropsychology Training: Advancing Late-Life Neurobehavioral Health: The goal of this project is to establish specialty training in geropsychology within Eastern Michigan University's Clinical Psychology Doctoral Program, thereby enabling persons 65 years and older with cognitive loss in Southeast Michigan to receive home-based or clinic-based integrated behavioral health services from doctoral students at low cost. During the two-year period of funding, faculty who are experts in geropsychology will model the service delivery, video-record the provision of services with seniors' (or their legal representatives') consent, and create a training package that will serve to sustain the state-of-the-art training in the future. Ronald Flowers, Leadership and Counseling Association of Leadership Educators (\$1,500) DRAG-IT: A Guidebook for Engaging College Students in Critical Reflection to Support Student Learning and Leadership Development in High Impact Practices: This research project seeks to develop and pilot a guidebook designed to aid faculty, instructors, student affairs staff, and student leaders in leading critical reflection with students engaged in high impact practices. The DRAG-IT Critical Reflection Guide will be based on conventional and experiential pedagogy and provide a framework for designing and facilitating individual & group conversations, class curriculum, and student affairs programs. Professional and student leadership educators will gain specific techniques for engaging college students in critical reflection during and after participation in HIPs. Ethan

Lowenstein, Teacher Education Great Lakes Fisheries Trust (\$145,000) The Southeast Michigan Stewardship Coalition, GLFT Confirmation 5, SEMIS 2017-2019: The Southeast Michigan Stewardship Coalition (SEMIS) regularly achieves high levels of quality implementation of our core structures that support communities of practice and sustained professional learning. These have included: A 9-day sequence of professional development each year; organizational resources to support whole school communities of practice and create communities of practice that align to each school's structures; On-site curriculum coaching; A partnership-grant application process that provides a vehicle for assisting teachers and partners in focused planning and the formation of new community partnerships, and sustaining existing partnerships; Structures for public sharing of PBE efforts such as the Community Forum and Annual Place-Based Education conference and the development of new communities of practice; and structures for the formation of professional learning communities called affinity groups led by Coalition members and organized around relevant professional PBE practice topics. This continuation grant builds on those activities. Bay and Paul Foundation (\$30,000) Transforming Place-Based Education Practice through Personalizing Teacher Learning: The Southeast Michigan Stewardship Coalition (SEMIS) engages young people and adults in PlaceBased EcoJustice Education efforts addressing local environmental issues. Through in-depth professional development and facilitation of school-community partnerships with teachers and community educators from 18 schools and 35 community organizations, SEMIS fosters visionary education communities. By focusing educational investigations on local issues, young people gain a deeper understanding of the interconnected social and environmental problems their communities face. As teachers and students see how they, themselves, can have a direct impact on creating just and healthy communities, they gain confidence and take agency as civic actors. Past Bay and Paul support has allowed us to use personalized curriculum coaching as a method of teacher support for fostering meaningful place-based learning. We have found that such support is especially critical in under-resourced schools serving high-poverty students. The proposed program would give us the opportunity to sustain and deepen our coaching efforts, refine our coaching protocols, and ultimately yield richer place-based experiences for students. Bloomfield Hills High School (\$6,190) BHHS SEMIS Professional Development Contract John Paul Catholic Church (\$4,000) JPIICS SEMIS Professional Development Contract Ypsilanti Community Schools (\$4,000) YCS Professional Development Contract The above contracts provide professional development for teachers in how to use a place-based education approach Wendy Thomas, College of Business Grand Valley State University (\$30,100) Michigan Small Business Development Center (SBDC) Regional Service Center 2017, Request for Supplemental Funding: Funding will expand SBDC counseling and training services to targeted industries within specific underserved markets in SE Michigan. This region currently has several business consultants with expertise in finance. The supplemental funding will be used to hire a consultant with expertise in marketing. The marketing consultant will be especially helpful for start-up businesses that require little or no financing.

## Office of Research Development and Administration Award Report, August 2017

\$327,714 Cathy Fleischer, English National Council of Teachers of English (NCTE) (\$14,400) National Council of Teachers of English (NCTE) Principles in Practice book: Annual Contract with NCTE to support Professor Fleischer's role as editor of NCTE journal Principles in Practice. David Pawlowski, Physics and Astronomy National Aeronautics and Space Administration, Sub-Award from University of Michigan (\$28,289) Understanding the effects of solar flares on the upper atmospheres of Mars and Venus - year 2: Dr. Pawlowski's work will primarily focus on the development and use of the Mars Global Ionosphere-Thermosphere Model (M-GITM) as well as the Venus Global Ionosphere-Thermosphere Model (V-GITM). He will assist in the development of V-GITM, simulate the response to both realistic and idealized solar flare cases within M-GITM and V-GITM, work closely with other team members to compare results and observations that illustrate how traveling atmospheric disturbances facilitate the transport of energy and momentum throughout the Mars and Venus upper atmosphere, and model results and observational analysis. Mary Motherwell, WEMU FM Public Radio Corporation for Public Broadcasting (\$144,974) WEMU Community Service Grant 10/01/2015-09/30/2017: Annual award for broadcasting Public Radio programs. Stephanie Casey, Mathematics National Science Foundation, Sub-Award from North Carolina State University (\$37,651) Enhancing Statistics Teacher Education with E-Modules (ESTEEM): This project will push the discipline of mathematics teacher education and statistics education forward by utilizing free online resources (and/or entire modules) within traditional settings in

university teacher preparation programs. The goals are: 1. Create online resources for infusing secondary mathematics teacher preparation programs with content focused on teaching; 2. Design modules and approaches to be used within teacher preparation programs; 3. Implement resources and modules in undergraduate courses and investigate students' learning and faculty implementation. Jessica Alexander, Engage Ann Arbor Area Community Foundation AAACF (\$2,400) FLY Creativity Lab and Parkridge Community Center: FLY Creativity Lab is Ypsilanti's center of collaboration between kids and working artists, makers and educators. FLY is dedicated to growing our community's creative capacity by bringing experiences that empower kids to imagine, invent, and innovate. The power of creativity is the power of change. It is the power of knowing how to face challenges and nurture independent vision. It is the art of making things happen. Programs are available to families throughout Washtenaw County. Emad Tanbour, School of Engineering Technology Ford Motor Company (\$50,000) Virtual Reality Lab: The School of Engineering Technology Virtual Reality (VR) Lab at Eastern Michigan University will use VR technology to improve patient compartment design of ambulances. This project will use virtual prototyping and design revision of patient compartments. Requested funding will be used to add a fourth VR wall that is needed to conduct this work. The fourth VR wall facilitates the visualization of the ambulance compartment and allows the design improvement project to be conducted with high fidelity and realistic proportions. Steve McGregor, School of Health Promotion and Human Performance MKinetics (\$25,000) University of Michigan, Michigan Corporate Relations Network (\$25,000) Validation of Inertial Motion Unit (IMU) Based Portable Joint Range of Motion Sensor System: EMU will collect joint kinematics, optical motion capture, and IMU data to validate joint range of motion for an inertial motion unit and motion sensor system for MKinetics, a sports technology company with locations in Detroit and Pittsburgh.

## Office of Research Development and Administration Award Report, September 2017

\$1,700,833 Jessica Alexander, Institute for the Study of Children, Families and Communities Michigan Department of Education (\$5,733) Summer Food Service Program for EMU Upward Bound Summer Academy 2017: Upward Bound is a year-round academic and college success program for students from high-needs school districts. EMU's Upward Bound program targets low-income high school students from Ypsilanti Community Schools who are academically at-risk and the first in their families to go to college. EMU-UB provides academic support, career exploration, advising, college campus tours, assistance with college and financial aid applications, etc. This award allows us to provide food during our Summer Academy. Jessica Alexander, Office of Academic Service Learning Michigan Department of Labor-Labor and Economic Growth (\$29,951) Protecting Construction Workers from Silica 2018: Eastern Michigan University's Center for Organizational Risk Reduction(EMU CORR) training program will (1) enhance MIOSHA's mission to help assure the safety and health of Michigan workers, (2) assist MIOSHA to implement its 2014 - 2018 Strategic Plan for Construction Health Hazards, and (3) assist Michigan employers in complying with new silica standards and protecting Michigan workers by providing effective, practical training and compliance advice. EMU CORR will provide an eight-hour comprehensive training program in workshop format to enable employers to recognize silica exposure hazards, legal obligations to protect workers from silica exposure, and select and implement appropriate exposure control measures for various construction situations and conditions. EMU CORR will hold ten seminars in multiple locations around the state. The target audience is employers engaged in (1) the construction of buildings, (2) heavy and civil engineering construction, (3) demolition, (4) residential construction, and (5) building material, garden equipment and supplies Ethriam Brammer, Institute for the Study of Children, Families and Communities US Department of Education (\$232,265; Year 3 of 5) Eastern Michigan University TRIO SSS Regular Program, 207 - 2018: The EMU TRIO SSS program supports first generation students, low income students, and students with disabilities. The goal is to increase college retention and graduation rates for these students. The program offers tailored support that includes academic tutoring, advice and assistance in course selection, counseling to improve financial literacy, information and assistance in applying for Federal Student Aid, and assistance in applying for admission to graduate school. Funding provides support for 140 students per year. The program succeeds through partnership with collaborating offices across campus. Wayne Doyle, Institute for the Study of Children, Families and Communities US Department of Education (\$154,815; Year 3 of 5) Eastern Michigan University TRIO SSS programs for Veterans: The EMU program promotes academic success among student veterans and serves a minimum of 80 students. The program provides dedicated academic and personal support, tailored to address the unique needs of

veterans who are in pursuit of a bachelor's degree from EMU. Expected outcomes are good academic standing, increased retention and degree completion and optimal use of available financial aid. The program partners with: EMU Veterans Resource Center, McNair Scholars Program, EMU Student Support Services, Financial Aid, Transfer Admissions, Upward Bound, University Advising and Career Development, the Veterans Community Action Team for Region 9, and the Consortium of Michigan Veterans Educators. Chris Finch, Child Care Center Michigan Department of Education (\$25,000) Child Food Care Program: The Child and Adult Care Food Program provides reimbursement for the meals provided to the children at the Children's Institute. Charles Graham, School of Social Work Washtenaw County Juvenile Drug Court (\$25,861) Adolescent Diversion Program 2018: The Adolescent Diversion Program (ADP) field unit is a cooperative effort between Eastern Michigan University (EMU) School of Social Work and Washtenaw County Juvenile Court. ADP seeks to provide court referred adolescent participants with a program of mentoring and advocacy services tailored to address their unique needs and to help them avoid further involvement with the juvenile justice system. Trained and supervised social work undergraduate student interns will meet and work with each assigned youth 6-8 hours weekly for 15 weeks, providing constructive interaction and feedback through various vocational, academic, and recreational activities. Allen Kurta, Biology Michigan Dept of Natural Resources (\$32,240) Bat surveys in underground mines and caves in northern Michigan (supplement to original contract plus more time): At various sites throughout the state, Dr. Kurta will monitor the number of hibernating bats and the approximate species composition to help determine the effects of an introduced fungal disease (white-nose syndrome) on bats in Michigan. Vijaykumar Mannari, School of Engineering Technology CRODA (\$15,963) CRODA Testing Agreement: This project involves testing and evaluation of new generation environmentally sustainable epoxy hardeners with commercially available counterparts to assess performance and corrosion resistance. Heather Neff, English Language and Literature US Department of Education (\$232,265; Year 1 of 5) McNair Program 2017 - 2018: The goal of the Eastern Michigan University McNair Program, is to provide disadvantaged college students with effective preparation for doctoral study. Each year the EMU program serves 36 undergraduate students, at least two-thirds of whom (24) will be first-generation and low-income, with the remaining third (12) coming from populations underrepresented in doctoral education. Eric Paradis, Physics and Astronomy National Science Foundation, sub award through University of Michigan (\$25,313) Electric fields, shock-fronts and structures in laser-induced magnetized plasmas: Plasmas that are cold or strongly coupled or magnetized occur, for instance, in astrophysical environments, magnetic-confinement fusion and ion trapping experiments. Further, the presence of a large magnetic field leads to novel phenomena such as magnetic pressure, anisotropic expansion/trapping in both astrophysical plasmas as well as plasma within fusion devices and magneto-hydrodynamic generators. The study of such plasmas is challenging; some are too remote while others may be inaccessible to diagnostic probes. Although laboratory studies of cold plasmas have been conducted in weak magnetic fields, the strong magnetic-field regime is still poorly understood. One outstanding goal is to reach the regime of strong coupling for both electronic and ionic components of the plasma. The proposed work focuses on the preparation and diagnostics of small-scale, easy-to-access laboratory plasmas that emulate the plasma systems above. Steven Pernecky, College of Arts and Sciences, US Department of Education (\$397,754) Strengthening the STEM Curriculum of Eastern Michigan University by Institutionalizing the CSIE Program, Year 4, 2017 - 2018: This is year 4 of 5 years of funding. The project will implement the innovation and effective CSIE program across STEM disciplines. The focus is on faculty professional development, curricular reform, and improved student connections to STEM faculty, peers, and the community through experiential community-based research activities. Zuzana Tomas, World Languages English as a Second Language US Department of Education (\$523,673; Year 2 of 5) Writing Research Intervention in Teaching English Language Learners (WRITELL): A QuasiExperimental Study Using Teacher Inquiry Communities to Support English Learners Opinion Writing Through the Use of Writing Strategies and Scaffolding: WRITELL provides professional development to improve instruction for English Learners (ELs). Undergraduate and graduate students at Eastern Michigan University will provide after-school tutoring services to EL youth and to EL adults during morning and evening classes. Intensive, year-long professional development for teachers will improve instruction for ELs and provide the subject for a quasiexperimental study of the effectiveness of scaffolding and writing strategy instruction for ELs. The project will serve 40 preservice teachers per year (200 total), 60 in-service teachers per year (300 total), 50 newly-licensed EL teachers by project end, 30 school leaders, counselors, school psychologists, etc. per year (150 total), 100 EL students in after-school tutoring programs per year (500 total), 250 parents

and children in family literacy workshops per year (1250 total), and 250 adult ELs in the community per year (1000 total).