

Grants Awarded Report

From: 9/1/09 to 9/30/09

Project Title: Center for Teaching and Learning in Science, Technology, Engineering and Mathematics Construction

Activation Amount: \$471,240.00

Agency: Health Resources and Services Administration

Personnel:

Co-PI - Sally Pardue,

PI - Glenn Binkley, Facilities and Business Services

Abstract:

Tennessee Technological University (TTU) requests funding to obtain equipment (including wiring and installation costs) for infrastructure technology and programmatic support materials for the Millard Oakley STEM Center for the Teaching and Learning of Science, Technology, Engineering, and Mathematics. The equipment will support learning studios as well as enhance the implementation of curricular and research activities proposed for the Center. The STEM Center is an interdisciplinary, campus-wide initiative of the University under the leadership of President Robert Bell. University Advancement personnel are actively seeking private donations; these gifts along with prior grant awards will address the balance of projected costs and the current request.

Grants Awarded Report

From: 9/1/09 to 9/30/09

Project Title: Swimming Performance of the Endangered Roanoke Logperch, *Percina rex*

Activation Amount: \$10,500.00

Agency: U. S. Fish and Wildlife Service

Personnel:

PI - Hayden Mattingly, Biology

Support Personnel - Jeffrey Holmes, Civil and Environmental Engineering

Support Personnel - Vincent Neary, Civil and Environmental Engineering

Abstract:

The objectives of this project are: 1) Determine the burst and sustained swimming performance of juvenile and adult Roanoke logperch in a laboratory flume; 2) determine the vertical leaping ability of adult Roanoke logperch in a living stream study unit; and 3) determine the volitional swimming ability of adult Roanoke logperch in a large laboratory flume under different culvert flow simulations.

Grants Awarded Report

From: 9/1/09 to 9/30/09

Project Title: Web PC459 Project

Activation Amount: \$13,960.00

Agency: Nashville State Community College

Personnel:

Co-PI - Curtis Armstrong, Decision Sciences and Management

PI - Kevin Liska, Business Media Center

Abstract:

During this project, TTU will develop a web-based computer application to facilitate the recording and dissemination of early college credit earned by high school students through "Credit by Assessment."

Grants Awarded Report

From: 9/1/09 to 9/30/09

Project Title: Enabling Children with Disabilities and Their Families in Tennessee Through Technology - EIME Project 2009-10

Activation Amount: \$7,000.00

Agency: Tennessee Department of Education

Personnel:

Co-PI - Kenneth Hunter, Basic Engineering

PI - Stephen Canfield, Mechanical Engineering

Abstract:

The mission of the Early Intervention and Mechanical Engineering (EIME) project is to significantly enhance the services provided to children with special needs in the region surrounding Tennessee Technological University (Upper Cumberland region). These enhanced services are provided through a mutually beneficial collaboration between early intervention and engineering at Tennessee Tech. The project will continue to leverage the significant engineering potential in our engineering students and the benefits of collaboration with the college of education and TEIS (Tennessee Early Intervention System), all located on the University. The project will demonstrate applications of adaptive and assistive technology to facilitate transitioning of children from early intervention to preschool programs and inclusive environments. This project will provide a value-added initiative to our State's system and it will be sustainable upon completion. Our focus of the 2009-2010 EIME project year is to further promote and extend the EIME model activities throughout the College of Engineering at TTU, and to support the growth of new programs elsewhere in the state. A number of potential avenues will be explored that include moving into the freshman level of engineering students, moving into other engineering disciplines such as Industrial Engineering, and involving

other engineering groups at both the college and pre-college level. At TTU, our program will continue to serve as a model for a service learning program potentially initiated in the curriculum at the freshmen level. In the upcoming year, the EIME program at TTU will integrate the use of the state-of-art CAD (Computer Aided Design) lab into the project curriculum. This initiative started in the 2008-2009 project year, where an entire class of students taking on EIME projects used the equipment in the TTU CAD lab to design and implement their projects. These projects followed a theme: adaptations for mobility and feeding, and made use of the 3D Systems Viper si2 SLA system rapid prototyping machine to develop assistive tech devices directly, or to create forms for molds and subsequent cast devices. The 2009-2010 year will explore further use of this equipment in meeting the goals of the EIME project.

The project will continue its tradition of meeting assistive technology needs and dissemination of this knowledge. It will continue to develop, test, evaluate and disseminate innovative procedures and products that apply family-centered practices, collaborative teaming, emphasis on natural environments, and considerations related to the delivery of early intervention and preschool services in rural, isolated and economically depressed areas of the State. Families, children and teachers will be enabled with regard to determining, applying, and evaluating assistive and adaptive "low" and "high" tech resources for their children.

Grants Awarded Report

From: 9/1/09 to 9/30/09

Project Title: TWRA FU Base 7-11

Activation Amount: \$30,000.00

Agency: Tennessee Wildlife Resources Agency

Personnel:

Co-PI - Phillip Bettoli, Cooperative Fisheries Unit

PI - James Layzer, Cooperative Fisheries Unit

Abstract:

TWRA base funds for 2009-10

Grants Awarded Report

From: 9/1/09 to 9/30/09

Project Title: Advanced Portable Power Institute-Phase IV

Activation Amount: \$1,383,438.00

Agency: U. S. Army Communications Command (CECOM)

Personnel:

PI - Kenneth Currie, Manufacturing Center

Senior Personnel - Jiahong Zhu, Mechanical Engineering

Senior Personnel - Joseph Ojo, Electrical and Computer Engineering

Senior Personnel - Mohamed Abdelrahman, Electrical and Computer Engineering

Senior Personnel - Venkat Subramanian, Chemical Engineering

Senior Personnel - Wenzhong Gao, Energy Center

Support Personnel - Brian Bates, Manufacturing Center

Support Personnel - Michael Renfro, Manufacturing Center

Abstract:

The goal of this program is to develop a range of advanced power generation and delivery concept to support soldiers on site in battlefield and other remote locations. The intention of this program is to move toward the development of a portable mobile Solid Oxide Fuel Cell (SOFC) battery charger for the warfighter that runs on a logistics fuel without the need for reforming.

Grants Awarded Report

From: 9/1/09 to 9/30/09

Project Title: Population Monitoring Strategies for the Imperiled Barrens Topminnow and Barrens Darter, with an Evaluation of Barrens Topminnow Movement Patterns

Activation Amount: \$30,000.00

Agency: U. S. Fish and Wildlife Service

Personnel:

PI - Hayden Mattingly, Biology

Abstract:

The purpose of this project is to 1) provide labor, technical assistance, and written reports for Barrens topminnow population monitoring; 2) prepare a population monitoring plan for the Barrens topminnow and Barrens darter; and 3) assess whether new Barrens topminnow populations have been established in the vicinity of two or more stocking locations.

Grants Awarded Report

From: 9/1/09 to 9/30/09

Project Title: Collaborative Research: Cross-Layer Exploration of Non-Volatile Solid-State Memories to Achieve Effective I/O Stack for High-Performance Computing Systems

Activation Amount: \$85,754.00

Agency: National Science Foundation

Personnel:

PI - Xubin He, Electrical and Computer Engineering

Abstract:

The objective of this research is to develop techniques that utilize solid-state memory technologies from device, circuit, architecture, and system perspectives across I/O hierarchy in order to exploit their true potential for improving I/O stack performance in high-performance computing systems. I/O friendly memory system architectures will be developed to enable hybrid processor-memory 3D integrations with largely reduced off-chip I/O traffic. Adaptive cache management and hotspot prediction methods will be developed to address the low random write performance of solid-state drives, and data processing techniques will be developed to enable run-time configurable trade-offs among solid-state drive performance characteristics. A comprehensive full-system simulation infrastructure will be developed to evaluate and demonstrate the research under diverse high-performance computing workloads. The research will facilitate the high-performance computing systems to most effectively utilize existing/emerging memory and processing technologies to tackle the grand I/O stack design challenge. It can greatly contribute to enabling high-performance computing systems to stay on track of their historic scaling, and hence benefit numerous real-life applications such as biology, chemistry, earth science, health care, etc. This project will also contribute to the society through engaging under-represented groups, research infrastructure dissemination for education and training.

Grants Awarded Report

From: 9/1/09 to 9/30/09

Project Title: Establish Non-essential Populations of Two Endangered Mussel Species in the Lower French Broad River, Tennessee

Activation Amount: \$27,735.00

Agency: U. S. Geological Survey

Personnel:

PI - James Layzer, Cooperative Fisheries Unit

Support Personnel - Benjamin Davis, Biology

Support Personnel - Kendall Moles, Water Center

Abstract:

In 2007, the Fish and Wildlife Service published a Final Rule to establish non-essential populations (NEP's) for 15 mussel species in the French Broad River below Douglas Dam and in the Holston River below Cherokee Dam. The biodiversity of the French Broad River once was among the richest in the southeast; at least 100 fish species and 53 mussel species including the oyster mussel, and the birdwing pearlymussel occurred in the lower river. The fauna was devastated following the construction and operation of Douglas Dam that released water with low DO and released no water during periods of no generation. By 1988, only 56 fish species and 12 mussel species remained. In 1987, TVA instituted a minimum flow release and mechanisms for oxygenating the dam's discharge; subsequently, the fish fauna began to increase suggesting that restoration of the mussel fauna might be possible. Based on improved habitat conditions, abundance and behavior of host fishes, and the occurrence of large donor populations, Layzer and Scott (2006) concluded that 30 species of mussels could be reestablished in the French Broad River. The oyster mussel and the birdwing pearlymussel are among the best candidates for reintroduction because their hosts are benthic species which are abundant in the river. Each year, 200 adults will be hand-collected from the Duck and Clinch Rivers, PIT tagged, and translocated to the French Broad River. Each year a stratified random sampling design will be used to quantitatively assess survival. After the first year, adults will be examined to determine if gametogenesis and spawning has occurred.

Grants Awarded Report

From: 9/1/09 to 9/30/09

Project Title: NSF Travel Support for Students Attending the 5th IEEE Vehicular Power and Propulsion Conference

Activation Amount: \$5,800.00

Agency: National Science Foundation

Personnel:

PI - Wenzhong Gao, Energy Center

Abstract:

This NSF project will support students with housing accommodations attending the 5th IEEE Vehicular Power and Propulsion Conference (VPPC 2009), to be held in Dearborn, Michigan on September 7-11, 2009. The NSF funds will help students attending this conference and get more participation from students. Through the NSF support, students can present their papers, participate in contemporary discussion to generate new research ideas, and interact with hybrid vehicle industries to learn the latest developments and technology challenging issues. A merit-based student selection criterion will be adopted to select 20 student awardees.

Grants Awarded Report

From: 9/1/09 to 9/30/09

Project Title: Tennessee Space Grant Consortium Award

Activation Amount: \$14,248.00

Agency: Vanderbilt University via NASA

Personnel:

PI - Corinne Darvennes, Mechanical Engineering

Senior Personnel - Jeffrey Austen, Electrical and Computer Engineering

Senior Personnel - Kristine Craven, Basic Engineering

Support Personnel - Glen Johnson, Mechanical Engineering

Abstract:

This outreach program is to introduce middle school girls to career opportunities in science, math, engineering, and technology. With support from the Space Grant, we will emphasize space exploration and space related industry.

Grants Awarded Report

From: 9/1/09 to 9/30/09

Project Title: TBR Marketing RODP Campaign

Activation Amount: \$50,000.00

Agency: Tennessee Board of Regents

Personnel:

Co-PI - Ferdinand Difurio, Economics, Finance and Marketing

Co-PI - J. D. Weinrauch, Economics, Finance and Marketing

PI - Kevin Liska, Business Media Center

Support Personnel - Michael Aikens, Business Media Center

Support Personnel - Paul Harrison, Business Media Center

Abstract:

The TTU Business Media Center will develop marketing tasks and implement innovative, highly sophisticated marketing solutions that will position ROCC to excel in the dynamic and increasingly competitive online educational market.