

# *Grants Awarded Report*

**From:** 12/1/07 to 12/31/07

**Principal Investigator:** Thomas Roberts, Biology

**Co-PI's:** Kenneth Morgan, Biology

## *Support Personnel:*

**Project Title:** Development of Geo-Referenced Database to Identify and Inventory Wetlands at Little River Canyon National Preservation

**Activation Amount:** \$25,000.00

**Agency:** National Park Service

## *Abstract:*

As part of a natural resource inventory at Little River Canyon National Preserve, the delineation and mapping of all wetlands and all other "waters of the United States" subject to jurisdiction under Section 404 of the Clean Water Act, and all wetlands subject to NPS procedures for implementing Director's Order #77 was requested from Tennessee Technological University. As part of the delineation and mapping, a geo-referenced database will be developed that consists of information about each wetland, including an assessment of the wetland's biotic and abiotic functions and values, and management recommendations for the resource. Maps, including U. S. Geological Survey (USGS) topographic maps, National Wetland Inventory (NWI) maps, soil survey maps, aerial photographs, and other existing data sets will be reviewed to locate potential wetlands within the park. Onsite investigations of all potential wetland sites will be conducted to examine and document soil, hydrology, vegetation, land use, and related characteristics using the above data sources in accordance with methods approved by the USCOE and NPS for wetland delineations. All wetlands will be delineated and classified using the Corps of Engineers Wetlands Delineation Manual (USCOE 1987), the Cowardin Classification System (Cowardin et al. 1979), and the Hydrogeomorphic Approach to wetland classification (Brinson 1993). An assessment of the potential functions and values provided by each wetland utilizing methods outlined in HGM guidebooks. Deliverables to be included in the final product for this project include: (1) an electronic database of all wetlands delineated at the park, (2) a GIS point coverage (ArcView format) of the delineated wetlands at the park, (3) information that characterizes the biotic and abiotic components at each site, and (4) a final preliminary project report, that will include a narrative discussion based on information in the electronic database for each delineated wetland located during Phase I. The report also will include an assessment of any current or potential impacts and recommendations for future management of the wetland resources.

***Principal Investigator:*** Vicki Henley,  
***Co-PI's:***

***Support Personnel:***

***Project Title:*** TTU Small Business Development Center 2008

***Activation Amount:*** \$55,223.00

***Agency:*** Tennessee SBDC

***Abstract:***

***Principal Investigator:*** Kenneth Currie, Manufacturing Center  
***Co-PI's:***

***Support Personnel:***

***Project Title:*** Center for Manufacturing Research 2007-08 (state appropriation addendum)

***Activation Amount:*** \$71,600.00

***Agency:*** State of Tennessee

***Abstract:***

**Principal Investigator:** Joseph Ojo, Electrical and Computer Engineering

**Co-PI's:**

**Support Personnel:**

**Project Title:** Mixed-Winding, High Phase Order Induction Machines with Multi-Phase, Multi-Level Converters for High Power Drive and Generator Applications

**Activation Amount:** \$40,090.00

**Agency:** Office of Naval Research

**Abstract:**

It is proposed to investigate the opportunities offered for high power drive and generator applications by using mixed-winding, high phase order induction machines actuated with multi-phase and multi-level inverters and rectifiers. These electric machines by virtue of their multi-phases and many winding sets deliver high total power capability in drive applications and give both controllable DC and AC sources using multi-phase, multi-level converters. Application areas include large pumps, compressors, high torque actuation and uninterrupted power sources. The inherent redundancy of the electric machines and the converters gives implicit high reliability and fault tolerance to the system, a higher degree of controllability and the opportunity for high power operation using relatively low-voltage rated switching devices.

**Principal Investigator:** Mohamed Abdelrahman, Electrical and Computer Engineering

**Co-PI's:** Sally Pardue, Mechanical Engineering

**Support Personnel:**

**Project Title:** Supplement to REU Site: Research Experiences for Undergraduates in the Industrial Application of Sensing, Modeling and Controls

**Activation Amount:** \$20,000.00

**Agency:** National Science Foundation

**Abstract:**

**Principal Investigator:** Holly Anthony, Curriculum and Instruction

**Co-PI's:** David Smith, Mathematics

**Support Personnel:**

**Project Title:** Learning from Data: Sense, Nonsense and Statistics (GEAR UP)

**Activation Amount:** \$86,126.00

**Agency:** Tennessee Higher Education Commission

**Abstract:**

This project provides two Saturdays and a 5-day summer institute focused on statistics and data in Grades 9-12 (limited to 30 participants; priority given to teachers in GEAR UP Tennessee counties). The purpose of the Spring Kickoff is to launch the summer activities by meeting with participants and providing prompts for pre-institute data collection. The goal of the 5-day institute is to provide activities and strategies for developing students' numerical literacy, statistical thinking, and critical thinking. The institute will focus on understanding basic descriptive statistical measures both graphically and numerically. Interactive "mythbuster" experiments will be conducted and statistics in the media will be explored. Participant teachers will receive books, standards-aligned lessons to use in their teaching, and appropriate technologies (graphing calculator, jump drive, etc.). Teachers will also receive training on Excel and the freely available statistical package R. The purpose of the August Follow-up is to provide more in-depth training with the technologies.

**Principal Investigator:** Kevin Liska, Decision Sciences and Management

**Co-PI's:**

**Support Personnel:**

**Project Title:** Ollie's Booster Seat and Seat Belt Safety Campaign-Tennessee Highway Patrol  
Education Offices

**Activation Amount:** \$18,000.00

**Agency:** Tennessee Department of Safety

**Abstract:**

***Principal Investigator:*** Katherine Osburn, History  
***Co-PI's:***

***Support Personnel:***

***Project Title:*** Faculty Research Fellowship

***Activation Amount:*** \$25,200.00

***Agency:*** National Endowment for the Humanities

***Abstract:***