

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Tennessee Early Childhood Pilot Program 2009-10

Activation Amount: \$82,670.00

Agency: Putnam County School Board

Personnel:

PI - Jane Baker, Curriculum and Instruction

Support Personnel - Ayse Mitchell, Child Development Laboratory

Support Personnel - Beula H. Baker,

Abstract:

This project will be used to support one Teacher I position and one Child Care Aide II position at the Child Development Laboratory. The purpose of this project is to enhance the learning and development of "at risk" children ages 3-5 years of age. The two positions that this project supports will be responsible for delivering age appropriate and developmentally appropriate materials in a safe and nurturing environment. We will establish a working collaboration between Putnam County School System and Tennessee Tech University by providing comprehensive services to 16 three and four year old children and their families. This project will meet the guidelines of Child Care Standards of Tennessee as regulated by the Department of Education (DOE) and/or the Department of Human Services (DHS).

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Healthy Start for Upper Cumberland Families and Young Children 2009-10

Activation Amount: \$12,861.00

Agency: Stephens Center

Personnel:

Co-PI - Elouise Jackson, Curriculum and Instruction

PI - Martha Howard, Human Ecology

Support Personnel - Melinda Swafford, Human Ecology

Support Personnel - Michael Mayton, Curriculum and Instruction

Abstract:

The Tennessee Technological University "Healthy Start for Upper Cumberland Families and Young Children" program is a technical assistance, consultation, training, and evaluation project designed to support the work of The Exchange Club/Holland J. Stephens Center for the Prevention of Child Abuse in Livingston, Tennessee. Healty Start is a national initiative with the mission of primary prevention of child maltreatment through the provision of services to families and young children who are at-risk. The TTU project provides support to this effort in our District by providing on-going training to program staff, by providing information and resources as requested, and by housing some of the program staff on campus. TTU also assists with formative evaluation as requested from the Stephens Center.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Center for the Management, Utilization and Protection of Water Resources 2009-10

Activation Amount: \$1,171,400.00

Agency: State of Tennessee

Personnel:

PI - Dennis George, Water Center
Support Personnel - Amy Knox, Water Center
Support Personnel - Daniel Dodson, Water Center
Support Personnel - Ginger Ensor, Water Center
Support Personnel - Glenda Shanks, Water Center
Support Personnel - Kim Stearman, Water Center
Support Personnel - Martha Wells, Water Center
Support Personnel - Mary Williford, Water Center
Support Personnel - Michael Kuley, Water Center
Support Personnel - Sandra Pigg, Water Center
Support Personnel - Sharon Berk, Water Center
Support Personnel - Sharon Dodson, Water Center
Support Personnel - Yvette Clark, Water Center

Abstract:

state appropriation

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: UT-CIS Contract for Employee Services 2009-10

Activation Amount: \$80,000.00

Agency: The University of Tennessee Center for Industrial Services

Personnel:

PI - Kenneth Currie, Manufacturing Center

Abstract:

Provide short-term consulting services to support the business and industrial assistance program administered by The University of Knoxville Center for Industrial Services.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Center for Manufacturing Research - ARRA Stimulus Funds 2009-10

Activation Amount: \$89,000.00

Agency: Tennessee Higher Education Commission

Personnel:

PI - Kenneth Currie, Manufacturing Center

Abstract:

ARRA Stimulus Funds 2009-10

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Center for Manufacturing Research - MOE Stimulus Funds 2009-10

Activation Amount: \$72,100.00

Agency: Tennessee Higher Education Commission

Personnel:

PI - Kenneth Currie, Manufacturing Center

Support Personnel - Joel Seber, Manufacturing Center

Abstract:

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Center for Manufacturing Research - State Appropriation 2009-10

Activation Amount: \$1,492,200.00

Agency: Tennessee Higher Education Commission

Personnel:

PI - Kenneth Currie, Manufacturing Center
Support Personnel - Ann Porter, Manufacturing Center
Support Personnel - Brian Bates, Manufacturing Center
Support Personnel - Cynthia Rice-York, Manufacturing Center
Support Personnel - Darlene Wiegand, Manufacturing Center
Support Personnel - Earl Hawkins, Manufacturing Center
Support Personnel - Joel Seber, Manufacturing Center
Support Personnel - Kwun-Lon Ting, Manufacturing Center
Support Personnel - Michael Renfro, Manufacturing Center
Support Personnel - Michelle Davis, Manufacturing Center
Support Personnel - Nan Guo, Manufacturing Center
Support Personnel - Phyllis Stallion, Manufacturing Center
Support Personnel - Rob Reab, Manufacturing Center
Support Personnel - Robert Qiu, Manufacturing Center
Support Personnel - Sue Richardson, Manufacturing Center
Support Personnel - Suzanne Henry, Manufacturing Center
Support Personnel - Zhonghe Bi, Manufacturing Center

Grants Awarded Report

From: 7/1/09 to 7/31/09

Abstract:

state appropriation for 2009-10

Project Title: FACS Career Technical Education Grant

Activation Amount: \$18,050.00

Agency: Tennessee Department of Education

Personnel:

PI - Sue Bailey, Human Ecology

Senior Personnel - Leeann Jolley, Human Ecology

Senior Personnel - Melinda Swafford, Human Ecology

Abstract:

The purpose of this grant is to provide services to the FACS Middle and High School teachers in Tennessee. Services include: managing and updating website, conducting teacher visitations, and presenting educational leadership and development workshops. Included in the grant is the opportunity to be State Department of Education FACS consultants.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Barrens Heelsplitter Ecology and Population Dynamics

Activation Amount: \$10,000.00

Agency: Tennessee Wildlife Resources Agency

Personnel:

PI - James Layzer, Cooperative Fisheries Unit

Support Personnel - Benjamin Davis, Biology

Support Personnel - Kendall Moles, Water Center

Abstract:

The Barrens heelsplitter is an undescribed mussel that is only found in parts of the upper Duck River drainage, Caney Fork River drainage and Collins River drainage in Grundy, Coffee, Warren, and Cannon Counties, Tennessee. It is found mainly in the headwater reaches of streams that drain a flat landscape feature known as the Barrens Plateau. Virtually nothing is known about the Barrens heelsplitter. This project proposes to examine all aspects of its life history including:

1. Determine its spawning and brooding period;
2. Determine fecundity;
3. Determine age and growth;
4. Determine size and age at sexual maturity;
5. Determine suitable host(s) in the laboratory, and verify their use as hosts in the field;
6. Determine natural glochidial infestation rates;
7. Determine population densities at 3 to 5 sites.

Expected Results: Because of the paucity of information regarding the distribution, ecology or population dynamics of this species, this project will provide insight into each of these research areas.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Laurel Dace Habitat Identification

Activation Amount: \$15,000.00

Agency: Tennessee Wildlife Resources Agency

Personnel:

Co-PI - Kendall Moles, Water Center

PI - James Layzer, Cooperative Fisheries Unit

Support Personnel - Benjamin Davis, Biology

Abstract:

The Laurel Dace is historically known from only three stream systems draining the Walden Ridge portion of the Cumberland Plateau in eastern Tennessee. The laurel dace is an inhabitant of low gradient, first and second order streams. Basic surveys were conducted in 1996 and the species was found at six a single localities. In surveys conducted in 2004, which focused on streams where the species had been collected in 1996, one population appeared to be extirpated and the southern populations have declines.

Objectives:

1. To qualify and describe suitable habitat for the Laurel Dace
2. To quantify available habitat for the Laurel dace

Expected Results: Because of the geographic isolation of the streams, if a laurel dace population is extirpated it is unlikely that re-colonization will occur naturally. Laurel dace will need to be either translocated or propagated. Qualifying and quantifying suitable habitat is the first step in recovery for the Laurel Dace. Once suitable habitat is determined and available suitable habitat has been identified, a strategy for reintroduction can be formulated.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Center for Energy Systems Research 2009-10

Activation Amount: \$883,400.00

Agency: Tennessee Higher Education Commission

Personnel:

PI - Sastry Munukutla, Energy Center

Support Personnel - Anthony Greenway, Energy Center

Support Personnel - James Beard, Energy Center

Support Personnel - Robert Craven, Energy Center

Support Personnel - Vijayasekaran Boovaragavan, Energy Center

Support Personnel - Wenzhong Gao, Energy Center

Abstract:

state appropriation for CESR 2009-10

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Center for Energy Systems Research Carryover 2009-10

Activation Amount: \$98,956.00

Agency: Tennessee Higher Education Committee

Personnel:

PI - Sastry Munukutla, Energy Center

Abstract:

2008-09 carryover funds

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Advancing the Hydrologic Potential of NASA's TRMM-Based Satellite Rainfall Estimation System for Global Flood Monitoring

Activation Amount: \$128,420.00

Agency: NASA

Personnel:

PI - Faisal Hossain, Civil and Environmental Engineering

Abstract:

The main research objectives of this project are: 1) to devise a framework for hydrologically relevant assessment metrics for the data producer that can advance the hydrologic potential of NASA's TMPA rain estimation system for flood monitoring and be amendable to operational institutionalization in a GPM based rain estimation system; 2) to demonstrate the hydrological relevance of the framework of assessment metrics for the TMPA system for flood monitoring over large-scale river basins; 3) to raise awareness of NASA's current and proposed missions on hydrologic measurements and inspire future generations of scientists at the K-12 level to tackle water-related global hazards; and 4) to demonstrate a deeper value of learning stochastic theory concepts for modeling natural variability of satellite based rain estimation in the undergraduate classroom.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Positive Behavior Support and Inclusion (PBS&I) Project 2009-10

Activation Amount: \$320,000.00

Agency: Tennessee Department of Education

Personnel:

PI - John Wheeler, Education Administration

Senior Personnel - Larry Peach, Education Administration

Senior Personnel - Michael Mayton, Curriculum and Instruction

Support Personnel - Amy Johnson-Gwilt, Curriculum and Instruction

Support Personnel - Charles Long, Learning Resources Center

Support Personnel - Julie Ton, Curriculum and Instruction

Support Personnel - Richard Bumbalough, Curriculum and Instruction

Abstract:

The purpose of the TTU Positive Behavior Support and Inclusion (PBS&I) project will be to deliver (a) technical assistance, (b) consultation, and (c) training in the area of positive behavior supports (PBS) and inclusion to regional LEA's in the 22-county Upper Cumberland region of middle Tennessee.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Algebraic Hierarchical Matrix Preconditioners for Two- and Three-Dimensional Saddle Point Problems

Activation Amount: \$34,295.00

Agency: National Science Foundation

Personnel:

PI - Sabine Le Borne, Mathematics

Abstract:

This project deals with the development, analysis and implementation of novel techniques for the solution of large, sparse linear systems of equations of saddle point type.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Collection of Data at Deer Check Stations

Activation Amount: \$750.00

Agency: Tennessee Wildlife Resources Agency

Personnel:

PI - Thomas Roberts, Biology

Abstract:

This study is conducted annually in cooperation with the Tennessee Wildlife Resources Agency (TWRA) to provide data on the size and quality of the white-tailed deer (*Odocoileus virginianus*) herd in the state. Students in the Wildlife and Fisheries Science program work either independently or with a representative from TWRA on the opening week of the regular firearms season at designated stations across the state and collect basic biological information on harvested animals. Data collected at all stations includes: sex, age, antler size, and condition. At some stations tissue samples are taken for evaluation relative to potential infectious diseases. These data in conjunction with that from other stations provide TWRA biologists and managers with the information needed to determine if current management strategies are producing their desired effect at both the regional and state levels. Students participating in active learning projects such as this have the opportunity to utilize the skills they have learned in the classroom and well as gain valuable experience working with wildlife professionals.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Life History and Reproductive Ecology of the Imperiled Williams' Crayfish, *Orconectes williamsi* Fitzpatrick 1966 (Cambaridae)

Activation Amount: \$4,598.00

Agency: Missouri Department of Conservation

Personnel:

PI - Hayden Mattingly, Biology

Abstract:

The goals of this project are to: 1) describe population structure and estimate growth, longevity, and mortality rates of Williams' crayfish in two different streams; 2) determine surface and subsurface substrate conditions that permit Williams' crayfish burrowing behavior under different stream flows; and 3) determine habitat use of female Williams' crayfish and Meek's crayfish at different stages of reproductive condition (i.e., pre-mating, mating, post-mating, in glair, with eggs, or with young). The rarity of these two species combined with the paucity of life historical and ecological data warrants attention. The knowledge gained from the study proposed herein will help inform and shape management strategies to conserve the species, and address highly ranked priorities in the MDC strategic crayfish management plan.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Monitoring the Plant Community at the Yuchi Waterfowl Project

Activation Amount: \$5,181.00

Agency: Tennessee Wildlife Resources Agency

Personnel:

Co-PI - Kenneth Morgan, Biology

PI - Thomas Roberts, Biology

Abstract:

The TWRA will construct an impoundment on a small, unnamed drainage adjacent to the Tennessee River in Rhea County, Tennessee. The purpose of this project is to provide flooded habitat that would benefit waterfowl during a period of the year that the Tennessee Valley Authority draws the lake level down to its winter pool elevation thereby eliminating flooding drainages such as occur at Yuchi. Data collected will serve to determine what, if any, changes occur to the existing forest community as a result of the impoundment.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: VEHI Subcontract with Vanderbilt

Activation Amount: \$12,491.00

Agency: Vanderbilt University (via AHRQ)

Personnel:

Co-PI - Michael Rogers, Computer Science

PI - Douglas Talbert, Computer Science

Senior Personnel - Jeremy Ey, Computer Science

Senior Personnel - Sheikh Ghafoor, Computer Science

Abstract:

In this project, we will work with a team at Vanderbilt University to make steps toward enabling several of the Memphis-area hospitals to share clinical data in support of patient care through the establishment of a Regional Health Information Organization (RHIO). We will focus on developing the tools and techniques to evaluate the patient matching components of the system and on assisting in the design of a distributed architecture that will be as consistent as possible with the developing national guidelines. More specifically, we are developing a gold standard data set for use in evaluation and a toolkit that uses this data set to help us, in partnership with the team at Vanderbilt, to evaluate the tools and techniques that we develop, and we will be reviewing the recommended architecture standard from Markle and the Connecting Health initiative to determine how the technical architecture for Memphis RHIO needs to be structured to enable interoperability with other RHIOs.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Modeling the Hydrologically-Relevant Features of Uncertainty of NASA's High Resolution Precipitation Products for Advancing Global Applications Over Ungauged Regions (Ling Tang)

Activation Amount: \$27,600.00

Agency: NASA (NESSF Program)

Personnel:

PI - Faisal Hossain, Civil and Environmental Engineering

Abstract:

In the post 2013 era of the NASA's Global Precipitation Measurement (GPM) mission, high resolution precipitation products (HRPP) from satellites will become increasingly common for various global hydrologic applications overland (such as flood detection using distributed models). For advancing the application of these datasets, the associated uncertainty information will therefore be critical for users to understand the realistic limits to which these HRPPs can be applied over an ungauged region. However, this represents a paradox. Satellite rainfall uncertainty estimation requires ground validation (GV) data. On the other hand, satellite data will be most useful over ungauged regions in the developing world that are lacking in GV data. The primary objective of this proposal is therefore to reconcile this paradox with the motivation to further unleash the potential of NASA's HRPPs for the developing world. This will be achieved as follows: 1) First, pertinent spatio-temporal characteristics of satellite rainfall uncertainty will be mathematically modeled as a function of season and location using a nine year archive of NASA's TRMM Multi-satellite Precipitation Analysis (TMPA) precipitation data. This step will help understand the spatial extent of the error regime and then evolve to a Koppen-type climatologic classification system for uncertainty; 2) second, a geostatistical mapping scheme will be developed and tested for spatial interpolation of error information from small-domain GV regions to the vast ungauged regions. Two important science questions are hoped to be answered through this project as follows: 1) how much climatologic classification of error regime is possible for characterizing uncertainty of NASA's HRPPs?; 2) if "error" is defined on the basis of ground validation (GV) data, then how can uncertainty be estimated for NASA's global rainfall data products without the need for extensive GV data?

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: CAT National Dissemination Assessment and Improvement of Learning

Activation Amount: \$260,943.00

Agency: National Science Foundation

Personnel:

Co-PI - Ada Haynes, Sociology and Political Science

Co-PI - Michael Redding, Biology

PI - Barry Stein, Counseling and Psychology

Abstract:

The primary goal for this project is to nationally disseminate an innovative assessment instrument and encourage its use for improving students' critical thinking skills. The CAT instrument (Critical Thinking Assessment Test) was refined with previous NSF support and collaboration with six other institutions across the country (University of Texas, University of Colorado, University of Washington, University of Hawaii, University of Southern Maine, and Howard University). This support allowed us to refine the CAT instrument so that it has (1) high face validity when evaluated by a broad spectrum of faculty across the country in STEM and non-STEM disciplines; (2) good criteria validity when compared to other instruments that measure critical thinking and intellectual performance; (3) good construct validity by using expert input from learning sciences; (4) good reliability; and (5) demonstrated cultural fairness. The current project will focus on both the dissemination of this instrument and expanding its use for program improvements in institutions across the country. The project activities will focus on five interrelated goals: (1) Designing and conducting CAT workshops to train the trainers from universities and community colleges across the country; (2) Expanding institutional use of the CAT instrument for both assessment and instructional improvement using best practices; (3) Developing a web version of the instrument; (4) Collecting national user norms; and (5) Establishing a center for assessing and improving student learning that will coordinate and sustain these efforts.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Recovery Evaluation of Threatened and Endangered Fishes in Abrams Creek, GSM

Activation Amount: \$65,995.00

Agency: National Park Service-Great Smokey Mountains National Park

Personnel:

PI - Bradford Cook, Biology

Abstract:

Streams within Great Smoky Mountains National Park (GSMNP) are home to nearly 60 fish species, four of which are listed by the U.S. Fish and Wildlife Service (USFWS) as Federally Threatened or Endangered. Abrams Creek, within GSMNP, contains duskytail darters *Etheostoma percnurum*, spotfin chubs *Erimonax monachus*, smoky madtoms *Noturus baileyi*, and yellowfin madtom *Noturus flavipinnis*. In 1956, the National Park Service and cooperators extirpated 32 fish species from lower Abrams Creek to establish a trophy rainbow trout *Onchorhynchus mykiss* fishery. Immediately following treatment, Chilhowee Reservoir was created by impounding the Little Tennessee River, which eliminated habitat in the lower portion of Abrams Creek for these species. Since extirpation from Abrams Creek, surveys have identified only four other streams outside GSMNP containing small viable populations of duskytail darter, only three that contain spotfin chub, only two that contain yellowfin madtoms, and only one containing smoky madtoms. Since 1986, the USFWS and the Tennessee Wildlife Resources Agency (TWRA) have contracted with Conservation Fisheries, Inc. (CFI) to propagate and reintroduce duskytail darters and spotfin chubs to Abrams Creek. CFI has provided annual in-kind monitoring of transplanted species; however, distribution, abundance, reproductive potential, and recruitment remain relatively unknown. No data exists concerning total distribution or abundance estimates for either species in Abrams Creek. The goal of this project is to evaluate the recovery status of all four listed species in Abrams Creek. Specific objectives are to: 1) Map the current distribution of four federally listed species on Abrams Creek from Abrams Falls to Chilhowee Reservoir; 2) Identify the amount of preferred habitat for each species within Abrams Creek; 3) Based upon available habitat, determine current recovery status (%) within Abrams Creek; 4) Mark and monitor cohorts of introduced and wild duskytail darters and spotfin chub in order to determine seasonal dispersal, abundance, and survival; 5) Establish long-term monitoring sites and monitoring protocols of each species; 6) Identify areas where preferred fish habitat and heavy visitor use areas overlap; and 7) Produce a visitor display for the lower Abrams Creek campground bulletin board to articulate the life history needs of each species, current status, and the visitor's role in protecting these species. Two MS students and cooperating biologists (NPS, USFWS, TWRA, CFI) will intensively snorkel and backpack electrofish reintroduction zones of each species over two years to identify factors limiting recovery (i.e., predation, disease, natural mortality, lack of suitable habitat, reproduction, etc.). Multiple cohorts of duskytail darter and spotfin chub will be introduced throughout their historical range in Abrams Creek. Each cohort will be uniquely marked with fluorescent elastomer tags to delineate cohorts when snorkeling. Individual cohorts will be released at different times of day and season, fish sizes, and ages to evaluate maximum survival and reproductive potential per cohort. Based upon cohort success and rearing costs, cohort reintroductions will be adjusted in successive years to maximize survival and cost.) Immediately following introductions, reintroduction zones will be intensively snorkeled bi-weekly to observe dispersal, predation, and other natural mortality. Snorkel data will assist in assessing relative abundance (observations per hour), distribution, and reproductive success during and after spawning. Predation will be evaluated by weekly electrofishing collections of smallmouth bass *Micropterus dolomieu* and rock bass *Ambloplites rupestris* in the vicinity of transplant sites. Once collected, predator stomach contents will be collected using special tubes that allow evacuation of stomachs without injuring fish. All predators will be released back to the stream. Stomach contents will be analyzed for presence of introduced fishes and, if present, their sizes will be noted. Observations will be made throughout the year regarding dispersal, population abundance, distribution, movement, predation, reproductive success, habitat utilization, and other environmental factors that may correlate to key life history characteristics of all four species. Backpack electrofishing gear will be used to evaluate duskytail darter populations in riffles throughout reintroduction zones, to determine distributions, and to monitor species density (number/100m²). In-stream habitat will be mapped and habitat suitability indices (HSI) will be produced throughout the reintroduction zone. Available and preferred habitat data will be entered into a GIS database to produce maps delineating habitat availability.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Assessment of the Mussel Fauna in the Area Impacted by Dredging for the Green River Ferry

Activation Amount: \$27,421.00

Agency: Vanasse Hangen Brustlin, Inc.

Personnel:

PI - James Layzer, Cooperative Fisheries Unit

Abstract:

Potentially, a 305-m-long reach of the Green River may be affected by dredging operations. Dredging will occur in 60 m of that reach (direct impact area), and possible indirect effects such as silt deposition might occur in the remaining 245 m portion (indirect impact area). Different sampling designs will be used in the direct and indirect impact areas. In the direct impact area, a systematic sampling design with three random starts will be used. A draft protocol (in review) for long-term monitoring of mussels within the park has adopted this design. Statistically, the design is robust and will provide a good estimate of the number of each species in the entire direct impact area, as well as their spatial distribution. A systematic (non-random) semi-quantitative design will be used in the indirect impact area. The rationale for using two different designs is based on the level of anticipated impacts to mussels and cost.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: CSR-PDOS: A Benchmarking Framework for High-Availability Distributed Storage Systems

Activation Amount: \$75,000.00

Agency: National Science Foundation

Personnel:

PI - Xubin He, Electrical and Computer Engineering

Abstract:

The availability and robustness of the I/O system is crucial to large-scale applications that generate and analyze terabytes of data. Storage systems are vulnerable to numerous hardware failures (I/O and metadata server crashes) and contribute to as much as 25% of all system failures. Actually, highly available data storage for high end computing is becoming increasingly more critical as high-end computing systems scale up in size. To achieve high availability storage systems, a challenging issue is to characterize the availability metric in addition to performance of these systems. This research investigates high-availability data and I/O services and benchmarking. The investigators develop a benchmarking framework to measure the storage performance in consideration of availability under various faulty conditions. The research involves four tasks: 1) develop faults/errors model and design fault injection schemes for storage systems; 2) develop an innovative benchmarking framework for high availability distributed storage systems under different faulty conditions; 3) implement an Availability and Performance Evaluation Toolset (APET) to integrate the fault injection and capture raw performance of storage systems at block level under various faults; 4) validate the benchmarking framework using APET for block-level storage systems.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Modeling of Moisture Diffusion in Composites

Activation Amount: \$30,000.00

Agency: United Launch Alliance

Personnel:

Co-PI - John Peddieson, Mechanical Engineering

PI - Jane Liu, Civil and Environmental Engineering

Abstract:

It is proposed to conduct an eight-month study of simulation techniques pertinent to moisture diffusion in composites. Existing formulations will be evaluated. Numerical solutions based on these formulations will be compared with available experimental data. An optimum formulation will be selected based on these comparisons.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: TTU Base-TN Teaching Program - 2009-10

Activation Amount: \$75,000.00

Agency: Tennessee Department of Education

Personnel:

Co-PI - Michael Mayton, Curriculum and Instruction

PI - Helen Dainty, Curriculum and Instruction

Senior Personnel - Thomas Willis, Curriculum and Instruction

Abstract:

Become A Special Educator in TN Teaching Program provides financial support for persons who meet eligibility criteria and desire to earn an initial TN licensure in special education or endorsement in special education. Support involves a commitment to teach in a TN public school two years for each academic year of financial support received, servicing students with disabilities ages birth through 21. Financial support will be in the form of tuition remission for either part-time or full-time study to professional personnel who desire to work in programs for the education of children with disabilities. Participation is limited to post-baccalaureate candidates admitted to teacher education programs (or eligible to be admitted and have provided written intent to seek admission) in approved TN colleges and universities. Educational assistants with at least two years of transferable college credit who are currently employed by a TN public school and service students with disabilities ages birth through 21. TTU will maintain a recruitment program to enroll 10 or more individuals who are either educational assistants in public TN special education classrooms serving students with disabilities who have two years or more of transferable college credit or post-baccalaureate students with a degree other than special education in coursework leading to special education licensure. TTU will maintain selection procedures and protocols and empanel a selection committee to review and make decisions about eligible applicants. Selected participants will be monitored and academic counseling sessions with all participating students will be held to determine the coursework needed and to help facilitate successful completion of the program leading to special education licensure and then employment in TN public school classrooms.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: TDE Special Education Institute - Strand I (2009-10)

Activation Amount: \$187,889.00

Agency: Tennessee Department of Education

Personnel:

PI - Helen Dainty, Curriculum and Instruction

Senior Personnel - Thomas Willis, Curriculum and Instruction

Support Personnel - Laura Graves, Curriculum and Instruction

Support Personnel - Michael Mayton, Curriculum and Instruction

Support Personnel - Peggy Davis, Curriculum and Instruction

Support Personnel - Rhonda Folio, Curriculum and Instruction

Abstract:

Strand I of the Institute will highlight the Tennessee Department of Education's Personnel Development Plan, which focuses upon the preparation of public school personnel to provide quality education for persons with disabilities. Regular and special educators in Tennessee will be invited to attend and study in depth the most successful methods of teaching students with disabilities, assessment procedures, and the successful management of aberrant behaviors both in the regular classroom and Special Education classroom.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: TDE Special Education - Strand II (2009-10)

Activation Amount: \$58,954.00

Agency: Tennessee Department of Education

Personnel:

PI - Helen Dainty, Curriculum and Instruction

Senior Personnel - Thomas Willis, Curriculum and Instruction

Support Personnel - Elouise Jackson, Curriculum and Instruction

Support Personnel - Melinda Swafford, Human Ecology

Support Personnel - Michael Mayton, Curriculum and Instruction

Abstract:

Strand II of the Institute will focus on Pre-K-1/Early Childhood Special Education. This institute will be conducted in conjunction and concurrently with the Summer Institute Strand I: Focus Special Education. The overriding mission of the Strand II Institute will be to improve and enhance the ability of 18 early childhood educators and early childhood special educators to deliver best practice services to young children with disabilities in both public school and other service delivery settings.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Assessment of Biotic Integrity, Water Quality and Habitat, Fishing Pressure, and Economic Value of the Fishery in the Caney Fork River below Center Hill Dam

Activation Amount: \$109,433.00

Agency: U. S. Geological Survey

Personnel:

PI - Phillip Bettoli, Cooperative Fisheries Unit

Abstract:

The objective of this project is to monitor water quality seasonally at five stations in the Caney Fork River below Center Hill Dam, assess temporal and spatial variation in biotic integrity in the river, and assess key attributes of the recreational fishery for trout in the river and estimate its economic value.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Scientific Coordination for the Cumberland Habitat Conservation Plans in 2009-10

Activation Amount: \$380,000.00

Agency: The Nature Conservancy

Personnel:

Co-PI - Evan Hart, Earth Sciences

Co-PI - Sean Blomquist, Biology

Co-PI - Trisha Johnson, Water Center

PI - Hayden Mattingly, Biology

Abstract:

TTU will provide support to the Cumberland HCP projects through coordination of the Cumberland HCP Science and Advisory Committee (SAC).

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Laboratory Testing of Increased Area (Pressed) Saddle Tap Tees to Determine Loss Coefficients

Activation Amount: \$22,440.00

Agency: Spiral Duct Manufacturers Association

Personnel:

PI - Stephen Idem, Mechanical Engineering

Abstract:

It is proposed to experimentally measure loss coefficients for increased area (pressed) saddle tap tee junctions. All fittings will be tested both for converging and diverging flows. This type of fitting has become available through the advancement of round fitting production by the "pressed" or "drawn" manufacturing process and provides a cost effective air moving junction. It is believed this increase in efficiency is created by the increased area inlet that is formed by the radius of the bend at the intersection of the body. The goal of the test program is to include the resulting loss coefficients data in the ASHRAE Duct Fitting Database. This project will be a contributing factor in improving the energy efficiency of HVAC Duct Systems, and further supports the development of the ASHRAE Duct Design Manual.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Tennessee Early Childhood Training Alliance 2008-10

Activation Amount: \$440,918.00

Agency: Tennessee Department of Human Services/TSU

Personnel:

PI - Sue Bailey, Human Ecology

Support Personnel - Cheryl Tompkins, Human Ecology

Support Personnel - Darcey Neyman, Human Ecology

Support Personnel - Jennifer Swallows, TECTA Project

Support Personnel - Leslie Hamlett, Human Ecology

Abstract:

The Tennessee Early Childhood Training Alliance is a statewide, systematic training and professional recognition system to support and enhance the quality of early childhood education and school-age child care personnel in Tennessee. The TECTA statewide training system provide early childhood personnel with access to affordable training. The TECTA statewide training system is based on the belief that all early childhood and school-age child care personnel need to acquire recognized professional knowledge and skills to provide appropriate care and education for children and youth. The key to quality programs is the professional preparation of teaching and administrative personnel with whom children and youth spend a significant portion of their formative years. Early childhood and school-age child care professionals also provide information and training to parents and other family members to support them in their parenting responsibilities. The TECTA system is approved and supported by the Tennessee Board of Regents and the Tennessee Department of Human Services. TECTA training includes important knowledge and skills defined by a statewide steering committee. It is based on national standards for the preparation of professional early childhood education personnel. The TECTA statewide training system promotes recognition and provides articulation between certificate and degree programs when participants meet the Tennessee Board of Regents admission requirement standards. The TECTA systems include orientation, intermediate and advanced training, practicum experiences, clinical supervision, and advanced program specialization. The Tennessee Early Childhood Training Alliance represents the first statewide early childhood training and professional recognition system in the nation to include entry level through advanced degree programs administered by a higher education system.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Tennessee Association FFA Camp Clements Maintenance Worker 2009-10

Activation Amount: \$32,386.00

Agency: Tennessee Association of FFA

Personnel:

PI - Ben Byler, Agriculture

Abstract:

The purpose of this contract is to provide staff for one full-time Maintenance Mechanic to perform a variety of skilled maintenance tasks at Camp Clements FFA Leadership Camp near Doyle, Tennessee. The maintenance mechanic will assist the camp director of facilities with the facilities and equipment including maintenance and repair of the housing facilities for campers, administration building, classrooms, auditorium, boating facilities, amphitheater, recreation hall, cafeteria, swimming pool, and staff housing facilities.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: The Reintroduction of Mussels into the Little Tennessee River at the Calderwood Dam By-Pass, Blount and Monroe Counties

Activation Amount: \$25,000.00

Agency: Tennessee Wildlife Resources Agency

Personnel:

PI - James Layzer, Cooperative Fisheries Unit

Support Personnel - Benjamin Davis, Biology

Support Personnel - Kendall Moles, Water Center

Abstract:

This project will determine the status of mussel species and feasibility of reintroductions to the Little Tennessee River at the Calderwood Dam By-Pass. Qualitative searches using snorkel gear or view buckets will be used to determine species currently present in the by-pass reach. All mussels collected will be identified and measured to determine population structure.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Upper Cumberland Child Care Resource and Referral 2009-10

Activation Amount: \$550,317.00

Agency: Signal Centers (via DHHS)

Personnel:

Co-PI - Leeann Jolley, Human Ecology
PI - Sue Bailey, Human Ecology
Support Personnel - Adrienne Butler, Human Ecology
Support Personnel - Angela Floyd, Human Ecology
Support Personnel - Betty Vaudt, Human Ecology
Support Personnel - Gayle Callis, Human Ecology
Support Personnel - Heather Bowen, Human Ecology
Support Personnel - Kathy Faulkner, Human Ecology
Support Personnel - Lynn Twitty, Human Ecology
Support Personnel - Paige Paul, Human Ecology
Support Personnel - Stephanie Lazuka, Human Ecology
Support Personnel - Susan Gilbreath, Human Ecology

Abstract:

Upper Cumberland Child Care Resource and Referral (CCRR), a part of the Tennessee CCRR Network, provides resources for parents, child care professionals, employers, and the community that support quality care and development of our children. Upper Cumberland CCRR, serving 17 area counties, provides parents with information about quality dependent care and refers parents to available resources. The center also provides technical support and in-service training to the child care workforce, with a special emphasis on birth to three and after-school programs. Center staff partner with local communities to assist in meeting their child care needs.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Tennessee 3-Star Industrial Assessment Center

Activation Amount: \$60,000.00

Agency: U. S. Department of Energy

Personnel:

Co-PI - Kenneth Currie, Manufacturing Center

PI - Glenn Cunningham, Mechanical Engineering

Abstract:

The proposed Industrial Assessment Center (IAC) represents a unified and collaborative approach to industrial assessments that will not only span the entire state of Tennessee but also cover some of the more IAC underrepresented areas of Kentucky, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Arkansas, and Missouri--all within a 150 mile radius! By utilizing the strong institutional bond between three of the six four-year universities under the authority of the Tennessee Board of Regents, the Tennessee 3-Star IAC will draw upon the engineering and technology resources of Tennessee Technological University (lead), the University of Memphis (satellite), and East Tennessee State University (satellite). The proposed IAC is referred to as the Tennessee 3-Star IAC to signify the historical geographic/economic/political divisions within the state: West Tennessee (Memphis), Middle Tennessee (Cookeville), and East Tennessee (Johnson City). By encompassing lead/satellite centers within each division, the Tennessee 3-Star IAC will reach an estimated population base of approximately 10 million and a manufacturing employee base of 1.0 million--once again within a 150-mile radius. Within the state of Tennessee, there are approximately 750 manufacturing concerns with less than 500 but more than 100 employees, and the Tennessee Valley region has been virtually untouched by previous IAC assignments (within the last 10 years) due to excessive geographic distance.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Distribution, Status, and Species-Habitat Relationships of the Green Salamander, *Aneides aeneus*

Activation Amount: \$5,000.00

Agency: Tennessee Wildlife Resources Agency

Personnel:

PI - Daniel Combs, Biology

Support Personnel - Samantha Wyatt,

Abstract:

1) Field surveys will be conducted on Catoosa Wildlife Management Area for the occurrence of Green Salamanders. 2) Field surveys, primarily visual encounters, will be conducted in and around rock outcrop habitats during both day and night time periods. 3) All Green Salamander locations will be recorded via GPS and appropriate data will be collected on individual salamanders. Captured individuals will be marked with pit tags and released at capture site. A representative sample of genetic material for the species will be collected and preserved. 4) Marked salamanders will be relocated using a pit tag wand and researchers will record re-captures with particular emphasis on habitat use. 5) A suite of habitat variables relevant to the Green Salamanders (to include Key Limiting Factors identified in the Tennessee Wildlife Action Plan) will be developed, and these variables will be recorded at all sites surveyed during the study. 6) Based on observed habitat parameters, a multi-variate model will be developed to predict critical habitats and key habitat factors.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Evaluation of Fish Stockings into Tennessee Warm Water and Cool Water Reservoirs

Activation Amount: \$35,850.00

Agency: Tennessee Wildlife Resources Agency

Personnel:

PI - Phillip Bettoli, Cooperative Fisheries Unit

Support Personnel - Benjamin Davis, Biology

Abstract:

In conjunction with Tennessee Wildlife Resources Agency (TWRA) biologists and supervisors, TTU personnel will design and conduct field and laboratory studies to evaluate current and future TWRA coolwater and warmwater hatchery stocking programs in Tennessee reservoirs. Where feasible, TTU personnel will estimate growth rates, survival rates, habitat use, contributions to year class strength, and/or rates of return to the creel for reservoir species reared and stocked by TWRA such as largemouth bass, striped bass, hybrid striped bass, walleyes, saugers, and muskellunge. TTU personnel will investigate the effects of stocking procedures, stocking density, genetic strain, and/or size-at-stocking on survival, growth, and rates of return to the creel of hatchery fish stocked into Tennessee reservoirs.

Grants Awarded Report

From: 7/1/09 to 7/31/09

Project Title: Reservoir Trout Fisheries

Activation Amount: \$70,000.00

Agency: Tennessee Wildlife Resources Agency

Personnel:

PI - Phillip Bettoli, Cooperative Fisheries Unit

Abstract:

The goal of this project is to describe the fate and dynamics of stocked trout populations in Tennessee reservoirs. The Tennessee Wildlife Resources Agency's Trout Management Plan for Tennessee 2006-2016 identified a need for research on these fisheries. This project will allow managers to more efficiently allocate hatchery trout and identify ways improve the management of these coldwater fisheries. Tennessee Technological University students and staff and U.S. Geological Survey employees will evaluate hatchery-supported trout populations in the four largest reservoirs stocked in the state: Dale Hollow, Watauga, South Holston, and Chilhowee. Objectives will be to (1) determine the most cost-effective methods to scientifically sample trout in these reservoirs; (2) estimate the volume of suitable trout habitat in each reservoir and model the relationship between hydrology, temperature, and oxygen profiles; (3) estimate the survival and growth of stocked trout; (4) estimate the relative abundance of prey species; and (5) identify, where feasible, factors limiting growth, survival, and returns to the creel of stocked trout.