

**Clemson University
Clemson, South Carolina**

**Reports Required by *Government Auditing Standards*
and the *Uniform Guidance***

For the year ended June 30, 2016

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Clemson University, South Carolina

Schedule of Expenditures of Federal Awards

For the year ending June 30, 2016

Federal Grantor/Pass-through Grantor/Program Title	Federal CFDA Number	Pass-through Entity Identifying Number	Passed Through to Subrecipients	Total Federal Expenditures
RESEARCH AND DEVELOPMENT CLUSTER				
Department of Agriculture				
2010 - Environmental Risk Assessment of Perennial Grasses Genetically Engineered for Abiotic Stress Tolerance	10.RD	2010-33522-21656	\$ -	\$ 47,052
Acquisition of Goods and Services	10.RD	58-6080-5-005	-	17,648
Acquisition of Goods and Services	10.RD	58-6080-5-009	-	22,804
Acquisition of Goods and Services	10.RD	58-6080-5-013	-	7,218
Acquisition of Goods and Services	10.RD	58-6082-5-003	-	127,039
Acquisition of Goods and Services	10.RD	58-6082-5-015	-	90,097
Acquisition of Goods and Services	10.RD	58-6082-6-007	-	76,041
Acquisition of Goods and Services	10.RD	58-6657-4-010	-	11,117
Acquisition of Goods and Services	10.RD	58-6659-4-008	-	760
Animal Health	10.RD		-	7,939
Assessment of the Potential for WNS in Bats of Congaree National Park	10.RD	15-JV-11330134-108	-	33,817
Assisting Farmers in SC to Adopt Modern Soil Moisture Sensing Technologies to Improve Irrigation Scheduling and to Enhance Environmental Quality and Farm Profits While Reducing Irrigation Water and Energy Consumption	10.RD	69-4639-14-0010	-	26,044
Bat Monitoring on the Andrew Pickens Ranger District	10.RD	15-PA-11081209-020	-	4,961
Building Entrepreneurial Farm Management and Land Stewardship Capacity for South Carolina New and Beginning Farmers	10.RD	2016-70017-25351	-	2,588
Clean WaterR3 - Reduce Remediate Recycle: Informed Decision Making to Facilitate Use of Alternative Water Resources	10.RD	2014-51181-22372	1,333,048	1,682,939
Clemson University Sustainable Community Project (CYFAR Sustainability)	10.RD	2011-41520-30408	-	142,377
Crop Protection and Pest Management Extension Implementation Program for South Carolina to Advance Stakeholder Adoption in Key Commodities	10.RD	2014-70006-22568	-	173,383
Data Needed for Foreign Regulatory Packages for the PPV Resistant Transgenic Prunus Domestica CV. 'HoneySweet'	10.RD	58-1931-4-012	-	60,349
Demonstration of Deep - Rooted Cover Crop Tillage and Controlled Traffic on Eliminating Hardpan Layer in Coastal Plain Soils to Enhance Soil Health and Farm Profits	10.RD	69-4639-13-0019	-	28,868
Demonstration of Innovative Nutrient Management Strategies Combined with Soil Amendments to Enhance Fertilizer Use Efficiency Farm Profits and Environmental Quality	10.RD	69-3A75-14-268	-	4,073
Developing a Life Cycle Assessment Model for Evaluating Policy Implications of Biofuels	10.RD	2012-67009-25266	-	7,464
Development of Plant Materials Native to Longleaf Ecosystems Within the Atlantic Coastal Plain of North and South Carolina	10.RD	09-CS-11081209-002	-	6,660
Enhancing the Nutrient Use Efficiency in Crop Plants by Tailoring the Nitrogen and Phosphorous Release Rates from Rendered Animal Materials	10.RD	2016-67020-25264	-	7,745
Enhancing the Sustainability of Livestock Production Systems on the Southeastern United States	10.RD	2010-51160-21072	-	1,450
Expanding the Use of Wood Building Products in South Carolina	10.RD	15-CA-11083150-053	15,584	78,048
Forest Health Conditions of Saint Thomas and Saint Croix United States Virgin Islands	10.RD	15-DG-11120107-021	-	3,730
Genomic and Breeding Foundations for Sorghum Bioenergy Hybrids	10.RD	2011-67009-23490	330,185	394,070
Genotypic Specificity in Plant - Herbivore Interactions and its Application to Management of an Invasive Weed	10.RD	2015-67014-22956	-	78,247
Hand Hygiene Promotion: An Essential Strategy for Preventing Foodborne Illness in Elementary Schools	10.RD	2011-51110-31020	26,602	42,809
Hatch	10.RD		-	4,353,313
Hayman Fire Resample	10.RD	14-JV-11221634-108	-	35,105
Horn Fly Antennal and Midgut Transcriptome Analysis	10.RD	58-6205-4-010	-	10,387
Identity and Ecology of Wiregrass-Infecting Smut and a Preliminary Investigation of the Relationship Between Time Since Burning and Infection Rates	10.RD	14-JV-11330123-123	-	4,856
Impact of Fescue Toxicosis on Fetal Development and Postnatal Growth	10.RD	2015-67015-23218	-	209,526
Impact of Prescribed Fire on Polycyclic Aromatic Hydrocarbon Production and Contaminant Photo-transformation Reductions in Coastal Plain	10.RD	2014-67019-21615	-	77,126
Improving Soil Health in Peach Orchards: A Demonstration	10.RD	68-4639-14-0022	-	10,096
Innovative Approaches to Manage and Reduce Feral Hog Damage to Agronomic Systems Woodlands and Ecosystems Services	10.RD	69-4639-13-0025	-	20,330
Intraspecific Functional Trait Variation Among Populations of Common Species of the Longleaf Pine Ecosystem	10.RD	16-JV-11330123-022	-	10,456
Landscape - Scale Thresholds of Early Successional Habitat: Reconciling Biodiversity Public Perception and Timber Yield in Managed Forests	10.RD	12-CA-11330134-092	-	51,428
McIntire Stennis	10.RD		-	616,227
Multivariate Analysis of Landscape - Level Fuels Data for the Southern Appalachian Mountains	10.RD	14-JV-11330136-105	-	4,648
National Visitor Use Monitoring	10.RD	AG-4670-C-12-0115	-	6,823
Optimizing No - Till Cover Crop Management for Weed Control in Vegetable Production: Applied Research and Extension Training to Facilitate Grower Adoption	10.RD	2015-70006-24163	-	61,262
Outreach Activities for the Consortium of Appalachian Fire Managers and Scientists	10.RD	16-JV-11330136-001	-	26,296
Population Genomics of Streptococcus Agalactiae from Infected Bovine and Fish Sources	10.RD	2013-67012-23286	-	57,206
Producing Biological Control Agents for Use in Hemlock Woolly Adelgid Management in the Southern Appalachians	10.RD	10-DG-11083150-031	-	17,337

The accompanying notes are an integral part of this schedule

Clemson University, South Carolina

Schedule of Expenditures of Federal Awards

For the year ending June 30, 2016

Federal Grantor/Pass-through Grantor/Program Title	Federal CFDA Number	Pass-through Entity Identifying Number	Passed Through to Subrecipients	Total Federal Expenditures
RESEARCH AND DEVELOPMENT CLUSTER, Continued				
Department of Agriculture, continued				
Repeated Prescribed Fires and Mechanical Fuel Treatments in the Southern Appalachian Mountains: Vegetation and Fuels after a Fourth Burn and a Second Mechanical Treatment	10.RD	15-JV-11330136-044	-	12,852
Reptile Amphibian and Invertebrate Response to Repeated Prescribed Fires and Mechanical Fuel Reduction Treatments in an Upland Hardwood Forest	10.RD	14-JV-11330136-018	-	43,579
Southeastern Budwood Program	10.RD	14-8130-0423-CA	-	9,423
Southeastern Budwood Program	10.RD	15-8130-0423-CA	-	86,666
Stress Induced Modification of the Quantity and Composition of Phytochemicals in Fruits: Optimizing the Nitrogen Supply for Enhancing the Nutritive Quality of Strawberries	10.RD	2016-67014-24578	-	9,658
Summer and Winter Roosting and Foraging Ecology of Southeastern Myotis	10.RD	14-JV-11330134-116	-	18,527
Toward a Near Real-Time Agricultural Drought Monitoring and Forecasting	10.RD	2015-68007-23210	-	53,240
Tracking and Managing Diseases of Floriculture Crops Caused by Oomycetes and Fungi	10.RD	58-1907-0-103	-	(2,867)
Tracking and Managing Diseases of Floriculture Crops Caused by Oomycetes and Fungi	10.RD	58-8062-5-037	-	21,618
Transforming Nanocellulose Into an Advanced Biorenewable Reinforcement With Hyperbranched Polymers	10.RD	2016-67021-25016	-	9,792
Understanding the Vulnerability of Tri-colored Bats to White-nose Syndrome in South Carolina: Torpor Patterns and Hibernacula Conditions	10.RD	16-JV-11330134-010	-	7,130
Unintentional Creation of a Heat Resistant Bacterial Biota and Its Impact on Food Safety	10.RD	2015-67031-23795	-	72,221
Use of Obed and Wild Scenic River Sport - Climbing Areas by Rare and Sensitive Bats	10.RD	14-JV-11330134-121	-	12,422
Water Use in the Propagation of Vegetative Animals	10.RD	58-3607-3-991	-	24,788
Pass-through programs from:				
California Strawberry Plant Growers Association				
Identification of Inoculum Sources and the Development of Methods to Reduce Dispersal of Xanthomas Fragariae to Minimize its Impact on International Trade of Strawberry Nursery Stock	10.RD	TASC-2015-31-Clem	-	28,832
Cooper Tire & Rubber Company				
Securing the Future of Natural Rubber - An American Tire and Bioenergy Platform from Guayle	10.RD	2016000344	-	15,092
Cornell University				
Eastern Broccoli: Developing An Eastern Broccoli Industry	10.RD	61314-9362	-	20,141
Kansas State University				
2015 4-H Military Partnership Grant	10.RD	S15048	-	22,026
2015 Military Connected Youth Local/Regional Program Support Project	10.RD	S15038	-	3,676
Air Force/4-H Military Partnership and Outreach and Support	10.RD	S15152	-	9,648
Louisiana State University				
Biology Ecology and Impact of Melanaphis Sacchari In Sugarcane and Sorghum Production Systems	10.RD	105611	-	1,751
Michigan State University				
RosBREED: Combining Disease Resistance with Horticultural Quality in New Rosaceous Cultivars	10.RD	RC104285B	-	207,822
Mississippi State University				
Comprehensive Field and Laboratory Studies on Cryphonectria Parasitica and Phytophthora Species Affecting American Chestnut Chinese Chestnut and Backcross Hybrids In Field Plantings In the Southeastern United States	10.RD	011900.322497.01	-	8,311
North Carolina Central University				
New Strategy and Method for Isolating and Concentrating Foodborne Pathogens	10.RD	PO# USDA-NIFA-AFRI-003958	-	64,476
North Carolina State University				
Impact of Transgenic Bt Crops on Helicoverpa Zea Ecology and Subsequent Resistance Risk	10.RD	2014-2219-01	-	46,990
Predicting In-season Infection Risk of Cucurbit Downy Mildew and Validation of A Downy Mildew Forecasting System	10.RD	2012-1968-01	-	334
Southern IPM Center Partnership	10.RD	2015-0085-07	-	17,670
Development of Grafting Technology to Improve Sustainability and Competitiveness of the U. S. Fruiting Vegetable Industry	10.RD	2011-1609-08	-	225,080
Development of Solid and Hollow-Core Cross-Laminated Timber Systems for Low-and Mid-Rise Construction	10.RD	2013-0043-01	-	20,088
Dispersal and Life History of Megacopta Cribraria from Kudzu and Implications for Management in Soybean	10.RD	2013-2839-02	-	9,451
An Investigation into Antixenosis Antibiosis and Tolerance Mechanisms to Kudzu Bug in Soybean	10.RD	2015-2467-01	-	6,411
Building Capacity to Control Viral Foodborne Disease: A Translational Multidisciplinary Approach	10.RD	2011-0494-01	-	436,397
Fellowship for Building Capacity to Control Viral Foodborne Disease: A Translational Multidisciplinary Approach	10.RD	2011-0494-01	-	39

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RESEARCH AND DEVELOPMENT CLUSTER, Continued				
Department of Agriculture, continued				
Pass-through programs from, continued:				
South Carolina Department of Agriculture				
Development of Peach Varieties with Superior Qualities for Enhanced Production Increased Consumption and a Competitive Advantage for the South Carolina Peach in the Global Market	10.RD	None	-	16,290
Enabling Marker Assisted Breeding for Fruit Size in Peach	10.RD	None	-	5,196
Finding Ways to Control Fungicide Resistant Anthracnose Pathogens of Peach and Strawberry	10.RD	None	-	743
Improved Control of Powdery Mildew and Anthracnose in Watermelon	10.RD	None	-	405
Improving Control of Southern Blight and Minimizing Losses in Tomato Crops with Use of Effective Fungicides	10.RD	None	-	9,423
Investigation into the Occurrence Prevalence and Cause of Peach Fruit Bronzing	10.RD	None	-	7,066
Nutritional and Biological Yield Improvement of SC Grown Kale (Brassica oleracea var. acephala L.) for Improved Human Health	10.RD	None	-	7,635
South Carolina Watermelon Disease Survey	10.RD	None	-	1,801
South Carolina Department of Social Services				
Child and Adult Care Program-Child Care Provider Training	10.RD	44000105507	-	157,150
South Carolina Forestry Commission				
Flooding and Forest Health: An Assessment on the Impact of the 2015 Flooding in South Carolina	10.RD	None	-	268
Impact of Laurel Wilt Disease on Redbay (Persea borbonia) Ecosystems	10.RD	None	-	23,753
Post-hurricane Fuel Dynamics and Its Implications to Fire Behavior	10.RD	None	-	15,154
The Center for Produce Safety				
Validating a Physically Heat-treated Process for Poultry Litter in Industry Settings Using the Avirulent Salmonella Surrogates or Indicator Microorganisms	10.RD	2016CPS05	-	24,630
University of Florida				
Climate Variability to Climate Change: Extension Challenges and Opportunities in the Southeast Area	10.RD	UFDSP00010720 (Previously UF111109)	-	50,282
Efficacy of Neonicotinoid-Alternatives for Managing Camellia Scale	10.RD	PO# 1500343415	-	10,000
Efficacy of Selected Insecticides for Managing Tea Scale in Containerized Ornamental Plants	10.RD	1600411969	-	9,264
Evaluate the Efficacy of Selected Insecticides Against Western Flower Thrips in Outdoor Ornamental Plant Production	10.RD	1600472074	-	1,157
Strategic Management of Multiple Diseases in Strawberry Nurseries and Production Fields in the Eastern United States	10.RD	UFDSP00010493	-	139,216
University of Georgia				
A System Approach to Improve Disease Management and Production of Watermelon In the Southeastern United States	10.RD	RF332-692/5054176	-	13,945
Forest Health Initiative: Biological Research Component Phase II Testing and Transgenics	10.RD	RR272-422/4944456	-	3,382
Fruit Bagging as a Strategy to Reduce Reliance on Pesticides for the Production of Peaches in the Southeast	10.RD	RD302-129/S001063	-	736
Implement Plan of Work for the Southern Region Sustainable Agriculture Research and Education (SARE) Program	10.RD	RD309-129/8644747	-	3,801
Increasing Sustainability of Peanut Cotton and Soybean Production Systems Through Innovative Interseeding Technology to Enhance Farm Profit and Reduce Pest Occurrence	10.RD	RD309-129/S001061	-	8,669
Sustainable Agriculture Research and Education (SARE) Professional	10.RD	RE675-171/4942706	-	27,865
Threshold Verification and Investigation of Border Sprays for Managing the Invasive Megacopta Cribraria in Commercial Soybean Production	10.RD	RE330-483/4353698	-	21,005
Weeds Nitrogen and Yield: Measuring the Effectiveness of an Organic No-Till System	10.RD	RD309-122/4944816	-	239
University of Hawaii				
New Engineered Approaches for Recovering Disperse Populations of Low-Tolerance Pathogens from Food	10.RD	2014-67005-21702	-	59,216
University of South Carolina				
Evaluation of Farm to Institution Programs (Farm to School)	10.RD	16-3084/PO#20000021990	-	1,185
University of Tennessee				
Bioleaching of Biomass to Improve Thermochemical Conversion Efficiency with Reduced Emission	10.RD	8500047637	83	17,818
Washington State University				
Genome Database for Rosaceae: Empowering Specialty Crop Research Through Big-Data Driven Discovery and Application In Breeding	10.RD	123519-G003399	-	52,226
Total Department of Agriculture			<u>1,705,502</u>	<u>10,972,563</u>

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RESEARCH AND DEVELOPMENT CLUSTER, Continued				
Department of Commerce				
Accelerate SC: Workforce Innovation Launch	11.RD	04-79-06838	-	55,638
FY2016 Summer Undergraduate Research Fellowship PML-PL SURF	11.RD	70NANB16H137	-	8,965
Relativistic and QED Effects in Highly Charged Ions	11.RD	70NANB16H204	-	2,020
Spectroscopy of Highly Charged Ions	11.RD	70NANB15H213	-	199,417
Pass-through programs from:				
GenWest				
Microplastic Marine Debris Research Support	11.RD	GSI-CU-1505	-	31,286
South Carolina Department of Natural Resources				
Restoration of the Southern Appalachian Brook Trout in Jocassee Gorges South Carolina	11.RD	SCDNR FY2015-003- P24015405715	-	1,916
South Carolina Sea Grant Consortium				
A Marine Larval Culture Facility for the Okeanos Research Laboratory	11.RD	M/PM-2E	-	7,195
Adaptability Toolkit for South Carolina's Coastal Water Infrastructure - Year 1	11.RD	N366 (R/CH-5)	2,659	16,598
Carbonic Anhydrase Mediation of Carbonate Supply in Oyster Larvae Impacted by Ocean Acidification	11.RD	M/PM-2D	-	6,157
Evaluating Wetland Function in Coastal South Carolina to Support Low Impact Development Decision-Making	11.RD	N153	-	7,939
Evaluating Wetland Function in Coastal South Carolina to Support Low Impact Development Decision-Making	11.RD	N253	-	41,935
Fishery-Related Working Waterfronts	11.RD	A/E-SG5	-	16,249
Microplastic Contamination in Coastal South Carolina: Sources Trophic Transfer and Abundance in Biota - Year 1	11.RD	N368 (R/ER-46)	-	11,130
Particle Contamination: Direct Effects on Salt Marsh-Tidal Creek Organisms and Indirect Effects on the Bioavailability and Toxicity of Polynuclear Aromatic Hydrocarbons (PAH)	11.RD	N255	10,820	34,538
Performance Based Design of Low Impact Development Technologies in Response to Climate Change Induced Changes in Rainfall Patterns - Year 1	11.RD	N367 (R/CH-6)	-	6,109
Wind and Rain Resistant Design for Coastal Cross Laminated Timber Building	11.RD	N157	-	2,731
Wind and Rain Resistant Design for Coastal Cross Laminated Timber Building	11.RD	N257	-	55,503
Total Department of Commerce			13,479	505,326
Department of Defense				
(YIP) Engineering Robust Enzyme Activity Through Fundamental Studies of Extremophile Enzymes	12.RD	FA9550-15-1-0163	-	104,636
A Multi-Function/Multi-Fuel ThermoAcoustic Generator/Heat Pump (TAG/HP) for Marine Expeditionary Forces	12.RD	N00014-14-1-0227	-	306,782
A Practical Approach for Modeling Matrix Diffusion Effects in REMChlor	12.RD	W912HQ-14-C-0009	10,918	176,967
Abiotic Transformation of Chloroethenes in Low-Permeability Formations	12.RD	W912HQ-16-C-0022	-	2,756
Acquisition of a Hot Oxygen Doppler Imager (HODI) Interferometer System for Measuring F-Region Ion Transport Ion Temperature and Hot Oxygen Composition with the Auroral Thermosphere	12.RD	FA9550-15-1-0361	-	97,469
Advanced Optical Fiber Development for Fiber Lasers with Sub-GHz Linewidth	12.RD	W911NF-14-1-0647	-	16,484
Anthropomorphic Interfaces on Automation Trust Dependence and Performance in Younger and Older Adults	12.RD	FA9550-12-1-0385	-	6,534
Bi-Component Fiber Approach to Making Superomniphobic Textile Surfaces	12.RD	W911QY-14-P-0413	-	43,317
Carbon Fibers Derived from Sustainable Precursors	12.RD	W911NF-10-2-0024	-	(401)
Combined Biological and Chemical Mechanisms for Degradation of Insensitive Munitions in the Presence of Alternate Explosives	12.RD	W912HQ-12-C-0058	7,083	32,856
Computer Numeric Control (CNC) Machine Center	12.RD	N00014-15-1-2683	-	189,805
Develop Integrated Management Practices for the Control of Chinese Tallow (Triadica sebifera) in Coastal Forests for Natural Resources Program, MCRD Parris Island South Carolina	12.RD	W9126G-14-2-0042	-	26,974
Dynamic and Adaptive Sensor Operations Under Uncertainty	12.RD	N00014-16-1-2110	-	45,714
Efficient Delivery of Information in Tactical Packet Radio Networks	12.RD	W911NF-15-1-0545	-	96,789
Enhancing mHealth Technology in the PCMH to Activate Chronic Patients	12.RD	W81XWH-15-C-0070	-	260,848
Experimental Investigation of Turbulence-Chemistry Interaction in High-Reynolds Number Turbulent Partially Premixed Flames	12.RD	FA9550-14-1-0404	-	36,039
Exploration of Carbon-Based Hybrid Nanoarchitectures as a Unique Platform for Managing Excited State Energies and Processes	12.RD	FA9550-16-1-0166	-	3,500
Facilitating Soldier Receipt of Needed Mental Health Treatment	12.RD	W81XWH-11-2-0010	-	43,406
Friction Stir Welding Behavior of Selected 2000-series and 5000-series Aluminum Alloys	12.RD	W911NF-11-1-0207	-	41,187
Gradient Films from Shape Memory Nanofoams for Waveguide Coating	12.RD	HDTRA1-10-1-0101	84,307	179,922
High Power Single Frequency Broad-area Diode Laser Emitters/Arrays and Their Applications in Microresonator Based Frequency Combs Optoelectronics Program	12.RD	W911NF-14-1-0640	-	207,124
Identifying and Evaluating Impacts to Wetlands from the Savannah River Estuary	12.RD	W912HZ-14-2-0002	-	264,348
IPA Agreement - Network Modeling	12.RD	W81EWF60342460/455337	-	12,960

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Federal Grantor/Pass-through Grantor/Program Title	Federal CFDA Number	Pass-through Entity Identifying Number	Passed Through to Subrecipients	Total Federal Expenditures
RESEARCH AND DEVELOPMENT CLUSTER, Continued				
Department of Defense, continued				
Liquid Sampling-Atmospheric Pressure Glow Discharge (LS-APGD) Microplasmas for Elemental, Isotopic, and Molecular Determinations	12.RD	HDTRA1-14-1-0010	-	97,000
Long-term Stable Conservative Multiscale Methods for Vortex Flows	12.RD	W911NF-14-1-0480	7,387	35,231
Magnetic Field Assisted Assembly of Ordered Multifunctional Ceramic Nanocomposites for Extreme Environments	12.RD	FA9550-12-1-0459	-	34,039
Military Uniform System Technology Program - MUST/DART DLA Assessment and Review Tool (DLA-MUST)	12.RD	SP4701-14-D-7004/0001	-	250
MVDC Power System Protection: Fundamental Research	12.RD	N00014-15-1-2272	-	52,505
MVDC Power System Protection: Verification	12.RD	N00014-15-1-2698	-	56,187
New Fouling Deterrent Strategies to Defeat Barnacle Biofouling	12.RD	N00014-14-1-0488	-	131,867
New RL Theory for Solving Continuous Nonlinear and Mixed-Discrete Optimization Problems	12.RD	N00014-16-1-2168	-	14,678
Optical Fibers with Elevated Threshold for Higher-Order Mode Instability	12.RD	FA9451-15-D-0009/0001	28,580	156,179
Optical Fibers with Elevated Threshold for Higher-Order Mode Instability	12.RD	FA9451-15-D-0009/0002	-	15,094
Optimization of TM-Doped Phosphosilicate Glass for High Power Fiber Lasers	12.RD	FA9451-15-1-0030	-	15,506
Optimization Under Uncertainty and Conflict: Algorithms for Heterogeneous Quadratic Programs	12.RD	N00014-16-1-2725	-	1,623
Performance as a Partner in the Military Uniform System Technology (MUST) Program - Option 1	12.RD	SP4701-14-D-7004/0003	-	13,881
Predictive Structure - Function Relationships for Enzymes Immobilized on Complex Surfaces	12.RD	HDTRA1-16-1-0023	-	21,091
Preventing Infection by Surface Modification of Orthopaedic Fracture Fixation Implants for Improved Limb Salvage Outcomes	12.RD	W81XWH-14-1-0438	136,436	271,891
Production and Characterization of Third Generation Cut Resistant Fibers via Acrylic/Copolyaramid Bi-Component Wet Spinning with a Focus on Scaled Up Production and Product Enhancements	12.RD	W911QY-13-C-0020	-	23,269
Rapid and Accurate Uncertainty Propagation for Nonlinear Dynamic Systems by Exploiting Model Redundancy	12.RD	FA9550-16-1-0158	-	24,630
Reactive Membranes for Rapid Isotopic Analyses of Waterborne Special Nuclear Material	12.RD	HDTRA1-16-1-0016	-	19,147
Reactive - Moiety Functionalization of Polyurea for Increased Shock-Mitigation Performance	12.RD	N00014-14-1-0286	-	134,767
Short Term Project (STP) - MUST/DART DLA Assessment and Review Tool (DLA-DART)	12.RD	SP4701-14-D-7004/0002	38,770	65,749
Southeastern Number Theory Meetings	12.RD	H98230-15-1-0176	-	15,675
Spatial and Spectral Multiplexing of Optical Beams	12.RD	N00014-14-1-0264	-	424,073
Subsurface Thermal Energy Storage (STES) for Improved Heating and Air-Conditioning Efficiency	12.RD	W912HQ-10-C-0027	-	20,548
Ultra-Trace Level Quantification of Alpha- and Beta- Emitting Radionuclides with Extractive Scintillating Resin	12.RD	HDTRA1-12-1-0012	-	284,354
Pass-through programs from:				
Clemson University Research Foundation				
3D Meta-Optics for High Energy Lasers	12.RD	20100669-04-CRF	-	201,281
Advanced Optical Fibers for High Power Fiber Lasers	12.RD	W911NF-10-1-0423	-	475,137
Light Filamentation Science	12.RD	232897	-	34,716
Novel Fiber Concepts for High Power Single Mode Fiber Lasers	12.RD	W911NF-12-1-0332	74,915	353,277
Corvid Technologies				
Physical Submodel Development for Turbulence Combustion Closure	12.RD	14-006 FA9550-14-C-0029//CLIN 0001: Charge Code 1041-253	-	199
ERC, Incorporated				
Kinetics of Pyrene Formation via Multistage Supercritical Extraction	12.RD	RS150567	-	60,000
FirstString Research Incorporated				
A Novel Peptide-based Topical Therapeutic to Promote Corneal Regeneration and Restore Corneal Biomechanics Following Blast and Burn Injuries	12.RD	W81XWH-15-C-0146	-	30,385
FlexTech Alliance, Incorporated				
Production of Large Area Energy Harvesting Devices via Roll-to-Roll Printing Processes	12.RD	RFP14-169_Clemson	35,905	54,125
Leidos, Incorporated				
Polymer Kelp for Vessel Stopping	12.RD	P010157849	-	6,426
Polymer Kelp Year 2	12.RD	P010157850	-	30,521
Lumany LLC				
Solid-State Fundamental Mode Green Laser For Ocean Mine Detection	12.RD	None	-	8,194
Massachusetts Institute of Technology				
Evaluation of Radiation-induced Photonic Defects in Si, Ge, Chalcogenides and Polymers	12.RD	5710003309	-	116,199
Nanowise LLC				
Oxygen Separation from Air to Provide Supplemental Oxygen for Injured Soldiers	12.RD	W911NF-16-P-0019	-	34,061
NextGen Aeronautics Incorporated				
Porous Hybrid Composite for Enhanced Thermal Protection Systems (ComTPS) PH2	12.RD	PO 13-09/ CPFF / COMTPS PH2/3080	-	111,268
Rutgers, The State University of New Jersey				
Single Crystal Fiber Lasers	12.RD	4816 PO# S1762674	-	92,067

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Schedule of Expenditures of Federal Awards

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Federal Grantor/Pass-through Grantor/Program Title	Federal CFDA Number	Pass-through Entity Identifying Number	Passed Through to Subrecipients	Total Federal Expenditures
RESEARCH AND DEVELOPMENT CLUSTER, Continued				
Department of Defense, continued				
Pass-through programs from, continued:				
Scientific Research Corporation				
Clemson University support for Personnel and Readiness Cyberspace Operations Course	12.RD	SR20160539 (TZ40)	-	15,607
Test Capabilities Development (TCD) for the Test Resource Management Center (TRMC)	12.RD	Clemson-TRMCBOA-19 / TO# SR20141971 // SRC0044-BA97-CP-1 SR20160780 (T216) // SRC-BOA-0011-16-001	-	326,003
Test Resource Management Center (TRMC) Test Capabilities Development (TCD) Solutions IES	12.RD	2015.0031.ARMY	-	45,070
Estimating Mobile-Immobile Mass Transfer Parameters Using Direct Push Tools	12.RD	2015.0031.ARMY	-	37,442
Southwest Research Institute	12.RD	J99059CP	-	639
CWA THERMAL DEFEAT IN REACTIVE ATMOSPHERES Structured Materials Industries, Incorporated	12.RD	42011-081215-02 // CU Ref# 20150002800	-	47,000
Transparent Electromagnetic Shield Coatings TH Wiedemeier & Associates Incorporated (THWA)	12.RD	201502	-	45,058
Providing Additional Support for MNA by Including Quantitative Lines of Evidence for Abiotic Degradation and Co-Metabolic Oxidation of Chlorinated Ethylenes The Boeing Company	12.RD	652218 PCC 08// PO# 1208128	-	42,286
High Performance Stretch Polymer Fibers University of California Santa Barbara	12.RD	KK1524	-	80,277
Bio-Inspired Synchronization and Sensors for Distributed Mobile Gunfire Detection Enhancing Situational Awareness University of Central Florida	12.RD	65018506 PO# 291964	-	25,180
Innovative Design and Manufacturing of Gradient-Index-Based Transformation Optics Components University of Dayton Research Institute	12.RD	RSC16015/K75401	-	49,438
Carbon Dots for Energy Conversion and Storage Applications	12.RD	RCS14053	-	7,417
Nanoenergetics-Fundamental Exploration and Technological Development University of Delaware	12.RD	42525	-	83,906
Tailored University Feedback for Forming (TuFF) University of Florida	12.RD	UFDSP00010980 00092056	-	95,850
Analysis and Algorithms for Imperfect Sensor Development and Operations Mathematical Approaches to WMD Defense and Vulnerability Assessments on Dynamic Networks University of Illinois	12.RD	UFDSP00010499	-	27,510
Novel Optical Fiber Materials with Engineered Brillouin Gain Coefficients SSL-1: Novel Fiber Lasers University of Michigan	12.RD	2012-03919-01	-	39,944
Control of Hub Motor Driven Multi-Axle Land Vehicles	12.RD	3003058759	-	34,446
Hybrid Electric Vehicle Thermal Management System Design	12.RD	3003058759	-	18,077
Improving Energy Efficiency and Mobility of Connected Fleets via Route Preview and Cooperative Control	12.RD	3003058759	-	80,680
Metam-Materials Design for Tank Tread Backers Pads	12.RD	3003058759	-	142,111
Modeling and Optimization of Electrified Propulsion Systems	12.RD	3003058759	-	92,909
Ultracapacitor Energy Storage for Improving Fuel Economy and Extending Battery Life in Heavy Vehicles University of Texas at Dallas	12.RD	3003058759	-	1,619
Search for Majorana Fermions In s-Wave Fermionies Super Fluids Virginia Polytechnic Institute	12.RD	1301030 PO#S089982	-	123,334
Chiral Spin Liquids and Other Topological Phases of Cold Atoms and Molecules in Optical Lattices	12.RD	450408-19244	-	13,644
Total Department of Defense			424,301	7,208,553
Department of the Interior				
Administrative Histories of Fort Sumter National Monument and Charles Pinckney National Historic Site	15.RD	P14AC01689	-	26,852
Bat Assemblages at Big South Fork National River and Recreation Area (BISO): Potential Effects of Prescribed Fire	15.RD	G14AC00049	-	17,604
Conservation Corridors for Desert Tortoises	15.RD	G13AC00019	-	2,578
Conservation Leadership (Science Advisor to the Director National Park Service)	15.RD	P13AC01379	-	217,554
Conservation of Parrott Rifle Tubes Carriages and Chassis at Fort Sumter	15.RD	P16AC00782	-	2,844

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RESEARCH AND DEVELOPMENT CLUSTER, Continued				
Department of the Interior, continued				
Department of Interior Strategic Sciences Group (SSG) Support	15.RD	G16AC00110	-	3,526
Developing an Alligator Conservation Strategy for South Carolina	15.RD	G12AC20329 RWO #92	-	4,759
Eastern Brown Pelicans: Dispersal Seasonal Movements and Monitoring of PAH's and Other Contaminants in the Northern Gulf of Mexico	15.RD	G12AC20367 RWO #91	-	117,089
Evaluating the Effect of White-Nose Syndrome on Long-Term Bat Community Structure and Remnant Bat Population Ecology	15.RD	G16AC00056	-	31,601
Fuels Management and Cultural Landscape Restoration Kings Mountain National Military Park and Other Southeast Region Parks	15.RD	P15AC01798	-	432
Historic Structure Report for Civilian Conservation Corps (CCC) Era Structures and Features at Kings Mountain National Military Park and Adjoining Kings Mountain State Park	15.RD	P15AC01156	-	33,304
Human and Ecological Health Impacts Associated with Water Reuse: Engineered Systems for Removing Priority Emerging Contaminants	15.RD	G15AP00171 P08AC00215 (formerly J5500080012)	36,333	36,333
Internship Program for Fire and Fuels Management	15.RD		-	31,192
JFSP Project 14-1-06-19 - Forest Fire Alters Disinfection Byproduct Precursors from Forested Watersheds	15.RD	L14AC00163	-	48,552
Liquefaction Probability Analysis of Pleistocene Deposits in the Greater Charleston South Carolina Area	15.RD	G16AP00118	-	6,225
Needs Assessment for Facilities Maintenance Specialty Career Field	15.RD	P12AC11224	-	22,882
Needs Assessment for Visitor and Resource Protection and Three Specialty Career Fields in Collaboration of the CESU Network	15.RD	P12AC11224 (H5000085050)	-	46,425
NPS Southeast Region Marine Science Support Center	15.RD	P15AC01833	-	7,050
Preservation of Historic Metal Architectural Elements of Battery Jasper	15.RD	P14AC01484	-	2,500
Program Management for the South Carolina Water Resources Center	15.RD	G11AP20105	6,280	69,662
Real Time Monitoring to Support Environmental Impact Management Strategies for Road Construction Activities on Foothills Parkway: Wears Valley, Bridge Number 2	15.RD	P10AC00544 (formerly J5471100020) P15AC00367 (under Master	-	7,085
Real Time Monitoring to Support Environmental Impact Management Strategies for Road Construction Activities on Foothills Parkway: Wears Valley Bridge Number 2	15.RD	#P14AC00882)	-	17,263
Reducing Uncertainty of Liquefaction Hazard Assessments in Aged Soil Deposits	15.RD	G16AP00003	-	28,245
Refinement of Training Needs Assessment for National Park Service within the Office of Communications	15.RD	P12AC11224	-	16,425
Retreat of Tidally Influenced Freshwater Forested Wetlands in the Southeast: Biogeochemical Investigations and Field Support	15.RD	G14AC00132	-	38,147
Shorebird Habitat Use During Migration in Cape Romain NWR	15.RD	G15AC00231	-	4,276
Spatial Ecology of American Alligators	15.RD	G15AC00264	-	10,472
State Water Resources Research Institute Program	15.RD	G16AP00082	-	8,987
The Effectiveness of Community Conservation Enterprises as a Tool for Sustainable Community Livelihoods and Conservation of Mountain Gorillas Across the Virunga Trans-boundary Landscape	15.RD	F16AP00402	-	17,515
The Effects of Management on Carbon Sequestration in Pocosin Wetlands of the Great Dismal Swamp Virginia	15.RD	G14AC00131	-	25,617
Visitor Use Management Research of Delaware Water Gap National Recreation Area	15.RD	P14AC01707	-	72,372
Pass-through programs from:				
North Carolina Wildlife Resources Commission				
Factors Influencing Bog Turtle Abundance and Nest Success in North Carolina	15.RD	WM-0306	-	4,330
South Carolina Department of Natural Resources				
Carolinas Regional Acoustic Bat Surveys	15.RD	SCDNR FY2015-001/ P24044304415	-	20,765
Determining Shorebird Utilization of Horseshoe Crab Spawning in Cape Romain NWR	15.RD	SCDNR FY2015-0022/ P24019497215	-	13,677
Distribution Population Ecology Genetic Relatedness and Habitat Associations of Eastern Spotted Skunks in South Carolina	15.RD	SCDNR FY2016-007/ P24014403016	-	49,925
Genetic Assessment of Eastern Brook Trout Populations in South Carolina	15.RD	P24015405715	-	8,520
Impacts of Special Hunting Clinics on the Recruitment and Retention of Youth and Young Adult Hunters in South Carolina	15.RD	SCDNR FY2016-002/ P24016400116	-	9,636
Loggerhead Shrike Distribution and Population Ecology in South Carolina	15.RD	SCDNR FY2016-010/ P24016400116	-	10,491
South Carolina Small River Conservation Planning Project	15.RD	SCDNR FY2015-11	-	5,392
Status Assessment for Blue Ridge and Piedmont Herpetofauna of High Priority in South Carolina	15.RD	SCDNR P24014306012/ P24014406012	-	18,704
Wildlife Management Institute				
Assessing Priority Amphibian & Reptile Conservation Areas (PARCAs) and Vulnerability to Climate change in the North Atlantic Landscape	15.RD	NALCC-2011-16	-	540
Conservation Cooperative	15.RD	ALCC 2014-02	-	128,248
Interactive Conservation Planning for the Appalachian LCC (ALCC)	15.RD		-	
Total Department of the Interior			42,613	1,245,596

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RESEARCH AND DEVELOPMENT CLUSTER, Continued				
Department of Justice				
Pass-through programs from:				
Chesterfield County School District				
Testing Integrative Models to Improve School Safety; Positive Behavior Interventions Support and the Olweus Bullying Prevention Program				
	16.RD	14CK-BK0012-CU	-	393,242
Total Department of Justice			-	393,242
Department of Labor				
Pass-through programs from:				
Greenville Technical College				
SC ACCELERATE - SC Adult College Completion Through E-Learning Resources and Academic Tracks to Employment				
	17.RD	TC-23765-12-60-A-45	-	482,905
Spartanburg Community College				
An Investigation on the Pedagogical Effectiveness of Virtual Reality Environments to Enhance Procedural Knowledge While Operating Waste Water Treatment Facilities				
	17.RD	01/TC-23767-12-60-A-26	-	93,719
Total Department of Labor			-	576,624
Department of State				
Internet Democracy Support for West Africa				
	19.RD	S-LMAQM-12-GR-1033	86,628	199,141
Confidential				
	19.RD	SG-R-IR1516-7 m00	-	46,101
Total Department of State			86,628	245,242
Department of Transportation				
2014 Dwight David Eisenhower Transportation Fellowship Program - Joshua Mitchell				
	20.RD	DTFH6414G00055	-	772
Science on the Move: STEM Engagement Opportunities to Rural Communities				
	20.RD	SC-17835-14	-	1,757
Pass-through programs from:				
South Carolina Department of Transportation				
Applying Successfully Proven Measures in Roadway Safety to Reduce Harmful Collisions in South Carolina				
	20.RD	1618; SPR No. 711	-	21,012
Best Construction Practices for Longitudinal Joint Construction and Compaction				
	20.RD	1824; SPR No. 728	-	2,583
Best Practices for Accessing Culvert Health and Determining Appropriate Rehabilitation Methods				
	20.RD	1694; SPR No. 718	-	107,974
Characterization of Portland Cement Concrete Coefficient of Thermal Expansion in South Carolina				
	20.RD	1730; SPR No. 722	-	109,968
Compliance with the United State Environmental Protection Agency (USEPA) Effluent Limitation Guidelines-Turbidity Control and Surface Outlets				
	20.RD	SPR No. 702	-	76,347
Cost Effective Strategies for Estimating Statewide AADT				
	20.RD	1691; SPR No. 717	29,001	125,080
Cross-Slope Verification using Mobile Scanning on SCDOT Interstates				
	20.RD	1714; SPR No. 719	4,440	70,979
Development of SC Databases and Calibration Factors for the Highway Safety Manual (HSM)				
	20.RD	1621; SPR No. 712	-	66,411
Evaluation of Open Graded Friction Courses: Construction Maintenance and Performance Phase II				
	20.RD	1781; SPR 725	-	42,055
Integration of the Incident Command System (ICS) Protocol for Effective Coordination of Multi-Agency Response to Traffic Incidents				
	20.RD	1543; Proj No. 699	15,430	15,430
Operational and Economical Analysis of Access Management				
	20.RD	1665; SPR No. 715	29,787	87,918
Professional Services Contract Manager On-Demand Training and Best Practices				
	20.RD	1635; SPR 713	-	140,379
Ranking of Pavement Preservation Methods and Practices				
	20.RD	1574; Proj No. 695	-	5,421
SCDOT Asset Collection				
	20.RD	1692; SPR No. 716	44,113	171,845
University of North Carolina - Chapel Hill				
Older Drivers' Pedal Behavior				
	20.RD	5-55002	343	3,627
University of Tennessee				
Automated Traffic Surveillance from an Aerial Camera Array				
	20.RD	8500039905 13-Clemson-	-	11,230
Development of a Security Platform for Vehicles to Infrastructure Network				
	20.RD	OE2/8500037533	-	4,597
STC - Educational Component				
	20.RD	8500037533	-	66,600
Wisconsin Department of Transportation				
Evaluation of H-pile Corrosion Rates for Wisconsin Bridges Located in Aggressive Subsurface Environments				
	20.RD	0092-16-03	-	35,163
Total Department of Transportation			123,114	1,167,148
National Aeronautics and Space Administration				
A Sounding Rocket Investigation of Neutral Jets Associated with Auroral Arcs				
	43.RD	NNX14AH09G	-	55,937
AZURE: Auroral Zone Upwelling Release Experiment				
	43.RD	NNX15AL71G	9,217	104,822
BL LAC Objects at the Highest Redshifts				
	43.RD	NNX14AK63G	-	5,761

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RESEARCH AND DEVELOPMENT CLUSTER, Continued				
National Aeronautics and Space Administration, continued				
BL LACERTAE OBJECTS AT HIGH REDSHIFTS	43.RD	NNX14AK49G	-	(27)
CHASING THE MOST POWERFUL BLAZARS	43.RD	NNX15AV09G	-	2,376
Cosmic Chemical Memory and Importance for Cosmochemical Samples	43.RD	NNX14AI25G	-	70,469
Geospace Response to Lower Atmospheric Wave Variability Due to the El Nino - Southern Oscillation	43.RD	NNX11AJ13G	-	38,645
Mesosphere-Lower Thermosphere Turbulence Experiment (MTEX) (Co-I Proposal Clemson University)	43.RD	NNX13AE26G	-	59,418
MIST: Mesospheric Inversion-layer Stratified Turbulence Study	43.RD	NNX14AH45G	-	84,773
NASA Space Technology Research Fellowships (NSTRF) - Fall 2014	43.RD	NNX14AN43H	-	65,683
NRA / NASA Earth and Space Science Fellowship (NESSF) Program - 2014	43.RD	NNX13AM28H	-	28,350
NRI-Small: Long, Thin Continuum Robots for Space Applications	43.RD	NNX12AM01G	-	123,495
Review of Multi-Team Systems Related to Long Duration Exploration Missions	43.RD	NNJ15HK12P	-	1,223
ROSES 2014/Fermi Guest Investigator - Cycle 8 HUNTING HIGH-REDSHIFT BL LACERTAE OBJECTS	43.RD	NNX15AU67G	-	12,659
ROSES-2014/Fermi Guest Investigator - Cycle 8 VERITAS OBSERVATIONS OF HARD NEW FERMI-LAT SOURCE	43.RD	NNX15AU68G	-	12,182
Swift, Nustar and the Origin of the X-Ray Background	43.RD	NNX14AH66G	-	20,892
Synthetic Biology for Recycling Human Waste into Nutraceuticals and Materials: Closing the Loop for Long-Term Space Travel	43.RD	NNX15AU46G	-	103,678
The Role of Field Aligned Ion-drag in Driving Vertical Winds and Mass Density Enhancements Observed in the Cusp Region of Earth's Upper Thermosphere	43.RD	NNX13AF29G	-	74,459
Utilizing Space-Based Technology to Determine Hydrological Properties of Soils for Characterizing Understanding and Predicting Terrestrially Linked Components of the Hydrologic Cycle	43.RD	NNX15AD47G	24,883	104,812
Pass-through programs from:				
ASTRA				
Transport Chemistry and Energetics of Water in the Mesosphere and Lower Thermosphere and Implications for Polar Mesospheric Cloud Occurrence	43.RD	171-01	-	818
College of Charleston				
BioNanomanufacturing of Carbide Aerogels	43.RD	521192-CMMartinez	-	6,620
Design and Characterization of Periodic Cellular Meta-Materials with Targeted Mechanical Acoustic and Effective Material Properties	43.RD	22-SG-Clemson_Thompson-RF	-	3,623
Design of Haptic Feedback Strategies within Human-Machine Interfaces for Unmanned Aerial Vehicles (UAVs)	43.RD	22-SG-Clemson_Wang-RF	-	7,342
Design of New Generation of Airframe Structural Materials Using the Materials Genome Initiative Approach	43.RD	22-NE-Clemson_Grujicic	-	30,000
Grading-and Shape-Dependent Multiscale Mechanics Model for Predicting Behavior of Extraterrestrial Soil Simulants	43.RD	521179-RP-CMChen	-	10,317
Graduate Research Assistantship: Evolution of Corrosion Reactivity During Sliding Wear of Titanium Nitride/Titanium Nanolaminate Coatings	43.RD	None	-	1,588
Graduate Research Assistantship: The Alteration of Titanium and Its Alloys for Enhanced Tribological Properties by the Deposition of Metallic/Ceramic Nanolaminates and Noble Gas Ion Implantation	43.RD	None	-	8,652
Iron Binding as the Primary Mechanism for Polyphenol Antioxidant Prevention of Cell Death and DNA Damage	43.RD	22-NE-Clemson_Brumaghim	-	13,304
Multi-Layer Magnetostrictive NDE/SHM Sensors	43.RD	521192-CMMyers	-	5,345
Palmetto Academy 2016: Creation of Functional Building Blocks with Simulated In-situ Martian Materials	43.RD	521179-PA-CMChen	-	5,116
Palmetto Academy 2016: Student Participation in Developing Nanomaterials-Derived Technologies for Space Applications	43.RD	521179-PA-CMSun	-	4,322
Palmetto Academy 2016: Synthetic Biology Enabled Recycling of Waste for Life Support Systems	43.RD	521179-PA-CMBlenner	-	4,443
Regenerable Cross Flow Filtration for Manned Mission to Mars	43.RD	521179-RP-CMCox	-	17,768
SC Space Grant Campus Director Administrative Budget	43.RD	521179-CD-CM18-SG-Clemson_Nagatomi-Director	-	1,043
South Carolina Space Grant Consortium Campus Director Funds	43.RD		-	2,020
Cornell University				
Waves and Instabilities from a Neutral Dynamo (WINDY)	43.RD	73921-10522	-	14,255
GATS, Incorporated				
Analysis of Short-Term Tidal Perturbations	43.RD	GATS_SC_12005	-	51,082
HJ Science & Technology Inc.				
Lab-on-a-Robot Platform for in-situ Planetary Compositional Analysis	43.RD	NNX13CP49C-2	-	90,427
Jet Propulsion Laboratory				
Identification of Forming Gas Giant Planets in the Transition Object HD141569	43.RD	1497084	-	9,479
National Institute of Aerospace				
Fracture Stabilization	43.RD	C15-2A00-CU / Activity 2A63-CU	-	4,855
National Space Biomedical Research Institute				

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RESEARCH AND DEVELOPMENT CLUSTER, Continued				
National Aeronautics and Space Administration, continued				
Pass-through programs from, continued:				
National Space Biomedical Research Institute, continued				
		SMST04202 // PO# 4600578313	-	89,674
Validation of a Cephalad Fluid Shift Countermeasure	43.RD		-	
Smithsonian Astrophysical Observatory			-	
Compton-Thick AGN: The Hunt is on (Proposal No. 17900432)	43.RD	G06-17131X	-	5,914
The Largest Complete Sample of Local AGN	43.RD	GO4-15132X	-	5,956
University of Central Florida			-	
Leadership-Followership: Moving Beyond Traditional Leadership to Build Highly Functional Autonomous Teams	43.RD	64016352-01	-	9,204
University of Louisville			-	
Short-term Tidal Variability from the Troposphere to the Dynamo Region	43.RD	ULRF14-1328-01	-	1,873
University of South Carolina			-	
Explore a Unified Ultra-efficient and Gravity-Insensitive Flow Boiling Regime for Space Missions	43.RD	15-2784 PO#91802 (15540 FC75)	-	57,920
			-	57,920
Total National Aeronautics and Space Administration			<u>34,100</u>	<u>1,432,567</u>
National Science Foundation				
Advanced Cyberinfrastructure - Research and Educational Facilitation: Campus-Based Computational Research Support	47.RD	ACI-1341935	1,274,462	1,599,138
AF: Medium: Collaborative Research: Sparse Polynomials Complexity and Algorithms	47.RD	CCF-1407623	-	48,876
AF: Small: Subdivision Methods: Correctness and Complexity	47.RD	1527193	-	41,295
AIR Option 2: Research Alliance Situational Intelligence for Smart Grid Optimization and Intelligent Control	47.RD	IIP-1312260	5,534	196,375
Analysis of Stochastic Context-Free Grammars for RNA Secondary Structure Prediction	47.RD	DMS-1312817	-	20,511
Application Characterization for Adaptive Computing Platform Determination for Computational and Data-Enabled Science and Engineering	47.RD	ACI-1404981	-	229,435
BIGDATA: F: DKM: Collaborative Research: PXFS: Parallel Based Transformative I/O System for Big Data	47.RD	IIS-1447771	-	136,284
Biomechanics of Self-Assembly of the Lepidopteran Feeding Device	47.RD	PHY-1305338	-	110,015
Capillary-Channeled Polymer Fibers: Chemistries and Structures for Protein Separations and Analytics	47.RD	CHE-1307078	-	125,156
CAREER: A New Efficient and Cooperative Large-Scale Distributed Data Sharing System	47.RD	CNS-1254006	-	49,964
CAREER: Advancing the Mechanistic Understanding of Field-Scale Preferential Flow and Transport Processes in Soils Using Geophysics	47.RD	EAR-1151294	-	88,122
CAREER: Computational Modeling of Protein Evolvability	47.RD	MCB-0953783	-	100,890
CAREER: Creating Effective Sustainable Inquiry-Based Instruction in Middle School Science Classrooms	47.RD	DRL-0952160	-	46,954
CAREER: Electromechanical Transduction of Vibratory Energy Harvesters in Random and Non-Stationary Environments	47.RD	CMMI-1055419	-	17,164
CAREER: Harnessing Hybrid Computing Resources in PetaScale Computing and Beyond	47.RD	OCI-1149644	-	81,401
CAREER: Hierarchical Mechanical Models of Cell Constructs	47.RD	CBET-1254609	-	99,222
CAREER: High Resolution Spectrochemical Imaging Through Tissue	47.RD	CHE-1255535	-	80,095
CAREER: Influence of Social Capital on Under-Represented Engineering Students' Academic and Career Decisions- ARRA	47.RD	EEC-0950710	-	19,225
CAREER: Integrated Materials-Mechanics-Manufacturing Approach to Hot Blank - Cold Die (HB-CD) Forming of Lightweight Alloy Sheets	47.RD	CMMI-1254670	-	105,342
CAREER: Modeling Irrationalities of Designers to Support their Decisions for Net-Zero Energy Buildings	47.RD	CMMI-1054122	-	64,049
CAREER: Models for Supply Chain Design and Logistics Management of Biofuels	47.RD	CMMI-1462420	-	111,222
CAREER: Multiscale Thermomechanical Analysis of Nanomaterials and Nanostructures	47.RD	CBET-0955096	-	12,249
CAREER: Particle Magnetophoresis in Ferrofluid Microflows for Lab-on-a-Chip Applications	47.RD	CBET-1150670	-	123,582
CAREER: Student Motivation and Learning in Engineering	47.RD	1055950	-	102,426
CAREER: The Evolution of Gas in Disks - Setting the Stage for Planet Formation	47.RD	AST-0954811	-	176,855
CAREER: Cooperative Control and Decision-Making for Human-Agent Collaborative Teams	47.RD	1454139	-	66,622
CAREER: Enabling Low-Cost Maintenance-Free Long-Term Embedded Sensing Without Batteries	47.RD	1453607	-	76,955
CAREER: Hierarchical Modeling for Rational Catalyst Design in Aqueous Conditions	47.RD	1554385	-	33,767
CAREER: InN Nanowire Based Multifunctional Nanocantilever Sensors	47.RD	1559711	-	43,532
CAREER: Multiscale Study of the Structure and Dynamics of Nanoparticle-Protein Coronae	47.RD	1553945	-	1,282
CAREER: Self-Protecting Artificial Implants and Invigorating the STEM Education Pipeline with Biomaterials	47.RD	1555224	-	9,561
Carolina Dynamics Symposium 2016-2018	47.RD	1600746	-	6,610
CC*IIIE IAM: FeduShare: Bridging Campus and Research Identity and Access Management for Self-Managed Collaboration	47.RD	ACI-1440609	54,781	149,253
CC*IIIE Region: Southern Partnership in Advanced Networking (SPAN)	47.RD	ACI-1440659	14,279	62,507

The accompanying notes are an integral part of this schedule

Clemson University, South Carolina

Schedule of Expenditures of Federal Awards

For the year ending June 30, 2016

Federal Grantor/Pass-through Grantor/Program Title	Federal CFDA Number	Pass-through Entity Identifying Number	Passed Through to Subrecipients	Total Federal Expenditures
RESEARCH AND DEVELOPMENT CLUSTER, Continued				
National Science Foundation, continued				
CC-NIE Integration: Clemson-NextNet	47.RD	OCI-1245936	-	217,258
Center for Aviation and Automotive Technological Education Using Virtual E-School [CA2VES]: A Resource to Meet Technician Workforce Needs	47.RD	1501695	25,707	344,408
Center for Aviation and Automotive Technology Education Using Virtual E-School [CA2VES]	47.RD	DUE-1104181	207,800	229,218
CGV: Large: Collaborative Research: Coupling Simulation and Mesh Generation using Computational Topology	47.RD	IIS-1314757	-	77,924
CGV: Large: Collaborative Research: Modeling Display and Understanding Uncertainty in Simulations for Policy Decision Making	47.RD	IIS-1212501	-	66,285
CHS: Small: Looking Across the Uncanny Valley: Procedural and Data-Driven Methods for Gaze Modeling	47.RD	1423189	-	143,919
CI SEEDS: Seeding the Next Generation Cyberinfrastructure Ecosystem - REU Supplement	47.RD	ACI-1212680	-	438
CICI: Data Provenance: Collaborative Research: Provenance Assurance Using Currency Primitives	47.RD	1547164	-	40,522
CI-P: Collaborative Research: HomeSHARE - Home-Based Smart Health Applications Across Research Environments	47.RD	CNS-1405723	-	1,829
CI-SEEDS: Seeding the Next Generation Cyberinfrastructure Ecosystem	47.RD	ACI-1212680	-	85,726
CNH-L: Coupled Social and Ecological Consequences of Conservation Easements	47.RD	1518455	-	110,073
Collaborative Research: "Hands-On" Collaborative Reasoning Across the Curriculum	47.RD	DUE-1022941	-	33,906
Collaborative Research: CEDAR-A Focused Study of Sustained Upward Vertical Winds in the Auroral Zone	47.RD	AGS-1243077	-	9,427
Collaborative Research: CEDAR-Development and Application of a Multi-site Observing Network to Study Mid-latitude Thermospheric Dynamics	47.RD	1138931	-	9,891
Collaborative Research: CEDAR-Development and Application of a Multi-site Observing Network to Study Mid-latitude Thermospheric Dynamics	47.RD	AGS-1138931	7,074	10,974
Collaborative Research: CEDAR-Observational and Numerical Studies of Tide-planetary Wave Coupling	47.RD	AGS-1139048	-	38,141
Collaborative Research: Characterizing Climate-Induced Qualitative Changes in Plant Biopolymer Composition and Their Influence on Soil Processes	47.RD	DEB-1145993	-	17,268
Collaborative Research: Comprehensive Investigation of Midlatitude Ionospheric Irregularities	47.RD	AGS-1007539	-	3,433
Collaborative Research: Data Selection for Unique Model Identification	47.RD	DMS-1419038	-	19,870
Collaborative Research: Developing Engineer of 2020 Traits: How Do Non-curricular Activities Impact African American Students?	47.RD	EEC-1159813	-	63,095
Collaborative Research: Effects of Hydrologic Processes on In Situ Stress Transients	47.RD	EAR-0944315	-	14,218
Collaborative Research: Engineering Education Research Leader NetWorkshops: Mentoring Communicating and Power Brokering for the Next Generation	47.RD	EEC-1314725	-	14,768
Collaborative Research: Fabry-Perot Interferometer (FPI) to Study Ion-Neutral Coupling Near the Southern Crest of the Equatorial Ionization Anomaly in the American Sector	47.RD	AGS-1153294	-	12,280
Collaborative Research: G-SESAME Cloud: A Dynamically Scalable Collaboration Community for Biological Knowledge Discovery	47.RD	DBI-0960586	-	356
Collaborative Research: Halocarbon Biogeochemistry in Coastal Wetland Ecosystems	47.RD	1529927	-	45,969
Collaborative Research: Hybrid Integration of Plasmonic Interferometer Sensors and Active Optoelectronic Devices on a Single Microfluidic Chip	47.RD	ECCS-1127957	-	(5,457)
Collaborative Research: II-NEW: Marcher - A Heterogeneous High Performance Computing Infrastructure for Research and Education in Green Computing	47.RD	1551262	-	137,403
Collaborative Research: Intracellular Localization of Biosynthetic Pathways for Conversion of Lipids to Dicarboxylic Acids in Oleaginous Yeast	47.RD	CBET-1403099	-	103,288
Collaborative Research: Jicamarca Radar Studies of Gravity Waves from D Region to Lower F Region	47.RD	AGS-1143514	-	59,130
Collaborative Research: PFISR Ion-Neutral Observations in the Thermosphere (PINOT)	47.RD	AGS-1243467	-	2,289
Collaborative Research: Systematic Review of Studies to Improve Success in STEM Degree Programs of Hispanic Students Matriculating through Two-Year Institutions	47.RD	DUE-1446323	-	23,054
Collaborative Research: Topological States and Quantum Information in Semiconductors and Cold Atom Superfluids	47.RD	PHY-1104527	-	(17)
Collaborative Research: US-Brazil IRES / Analytical Applications of Nanomaterials and Microfluidic Devices	47.RD	1565508	-	13,788
Collaborative Research: An Intelligent Restoration System for a Self-healing Smart Grid (IRS-SG)	47.RD	ECCS-1408141	-	10,415
Collaborative Research: Comprehensive Investigation of Midlatitude Ionospheric Irregularities	47.RD	1360594	-	23,408
Collaborative Research: EAGER: Energy Harvesting via Thermo-Piezoelectric Transduction	47.RD	1549977	-	20,978
Collaborative Research: Exploring the Evolution of Design Requirements Throughout the Design Process Using Network Models	47.RD	1463370	-	29,500
Collaborative Research: Heterogeneous Ice Nucleation in Clouds: A Synergistic Experimental and Simulation Approach	47.RD	1541944	-	74,759
Collaborative Research: High Resolution Spectroscopy and Spectro-Astrometry of Warm Gas in Herbig Ae/Be Stars: A Search for Forming Gas Giant Planets	47.RD	1517014	-	1,271

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Schedule of Expenditures of Federal Awards

For the year ending June 30, 2016

Federal Grantor/Pass-through Grantor/Program Title	Federal CFDA Number	Pass-through Entity Identifying Number	Passed Through to Subrecipients	Total Federal Expenditures
RESEARCH AND DEVELOPMENT CLUSTER, Continued				
National Science Foundation, continued				
Collaborative Research: Intersectionality of Non-normative Identities in the Cultures of Engineering (InIce)	47.RD	EEC-1428523	22,636	34,073
Collaborative Research: Planning Grant: I/UCRC for Advanced Mammalian Biomanufacturing Innovation Center (AMBIC)	47.RD	1464459	-	7,793
Collaborative Research: Planning Grant: I/UCRC for Real-Time Intelligence for Smart Electric Grid Operations (RISE)	47.RD	1464637	-	15,537
Collaborative Research: Student Perspectives on Researcher Identity and Transformed Epistemologies (SPRITE)	47.RD	1531607	-	29,829
Collaborative Research: Variational Structure Preserving Methods for Incompressible Flows: Discretization Analysis and Parallel Solvers	47.RD	1522191	-	67,012
Collaborative Research: Who's Not at the Table? Building Research Capacity for Underserved Communities in Engineering	47.RD	1551605	-	33,374
Collaborative Research: A Long-Term Investigation of Auroral and Tidal Forcing of E-Region Thermospheric Winds at High Latitudes	47.RD	1552214	-	3,576
Conductance Variability in Non-Conjugated Polymers: Memristors for Neuromorphic	47.RD	1507266	-	42,067
Conjugated Polymer Nanoparticles for Nanoscale Chemical Microscopy	47.RD	CHE-1058885	-	22,325
Coupling Small-Particle Adsorbents with Membranes for Trace-Containment Removal in Water Treatment	47.RD	CBET-1236070	-	108,733
CPS: Synergy: Security of Distributed Cyber-Physical Systems with Connected	47.RD	1544910	-	122,422
Critical Raindrop Characteristics: Fall Speed Shape and Size Distributions	47.RD	AGS-1144846	-	2,659
CSBR: Natural History: Expanding the footprint and the reach of the Clemson University Arthropod Collection	47.RD	1457909	-	253,500
CSR: EAGER: A Scalable and Efficient Resource Discovery System for Large-Scale Distributed Systems	47.RD	CNS-1249603	-	724
CSR: Large: Collaborative Research: Computational Jewelry for Mobile Health	47.RD	CNS-1314342	-	218,842
CyberSEES: Type 1: Enabling Sustainable Water Supplies Through Self-Powered Sensor-Based Monitoring	47.RD	1539536	-	3,052
De Branges Spaces as Models for a General Theory of Function Spaces	47.RD	1600874	-	8,766
Digitization TCN: Collaborative Research: The Key to the Cabinets: Building and Sustaining a Research Database for a Global Biodiversity Hotspot	47.RD	EF-1410094	14,625	25,598
Dimensions: Collaborative Research: Functional Diversity of Chemosymbiosis in Lucinid Bivalves from Coastal Biomes	47.RD	1342763	-	39,254
DMREF: Collaborative Research: An Integrated Multiscale Modeling And Experimental Approach To Design Fouling-Resistant Membranes	47.RD	1534304	-	78,157
EAGER: An Efficient and Effective Distributed Information System	47.RD	IIS-1354123	-	260,041
EAGER: Coupled Optomechanical Resonators and Arrays	47.RD	ECCS-1331728	-	59,111
EAGER: Developing a Framework for a Cyber-Infrastructure General Practitioner Program	47.RD	OCI-1251544	-	11,686
EAGER: Ecosystem Modeling for Infrastructure Evaluation	47.RD	ACI-1343033	-	13,655
EAGER: Novel Photoacoustic Sensor Using Piezoresistive GaN Microcantilever	47.RD	1500007	-	114,062
EAGER: Advancing Understanding of Function Modeling Reasoning and Thinking in Design by Mapping Behaviors to Cognitive Explanations	47.RD	1547236	-	84,696
EAGER: Building a Framework to Advance Research through Undergraduate Participation: Investigating pH in 3D Tissue Test Systems	47.RD	CBET-1451319	-	6,796
EAGER: Collaborative Research: SciWiNet: A Science Wireless Network for the Research Community	47.RD	CNS-1346632	-	18,795
EAGER: Defending Against Visual Cyberbullying Attacks in Emerging Mobile Social Networks	47.RD	1537924	-	22,988
EAGER: UVC Microbial Inactivation Within Model Water Treatment Membrane Modules Via X-Ray-Driven Radioluminescence	47.RD	1551534	-	55,845
Eighth Annual Graduate Student Mini-conference in Computational Mathematics; Clemson, SC; February 5-6, 2016	47.RD	1547107	-	8,597
Enhanced Production of Advancing Biofuels Through Model Guided Synthetic Biology	47.RD	CBET-1437836	-	97,759
ERC-Small Business: Micropatterning of Film Extrusion Die Surfaces	47.RD	EEC-1128481	-	(174)
Evaluating Sustainable Disposable Options for Compostable Biopolymers	47.RD	1553126	-	31,695
Evaluation of Nanoparticle Behavior During Transitions from Engineered to Natural Systems	47.RD	CMMI-1057633	-	(2,084)
Experimental and Modeling Study of Risk from Ember Storms	47.RD	CMMI-1200560	-	31,782
Experimental Investigation of Multiscalar Subgrid-Scale Mixing and Turbulence-Chemistry Interaction	47.RD	CBET-1333489	-	17,954
Exploiting Liquid-State Transduction Materials in Vibratory Energy Harvesting	47.RD	CMMI-1335049	-	71,236
Exploring Non-Normative Forms of Capital Wealth and Knowledge Used by Engineering Students	47.RD	1463808	-	78,544
Extrapolating the Concept of Protein Corona for Understanding Nanoparticles at Large	47.RD	CBET-1232724	12,467	12,905
Fast and Scalable Multigrid Methods for Hypergraph Partitioning Problems	47.RD	1522751	-	10,381
Fluorescent Polymer Nanoparticles for Nano-Imaging and Sensing	47.RD	CHE-1412694	-	93,873
GOALI: Low-Ash Lignin Biofuel from Black-Liquor Streams	47.RD	CBET-1236759	-	52,819
GOALI: Tuning Renewable Solvent Systems for Lignin Purification and Fractionation	47.RD	CBET-1403873	-	108,058
GP-EXTRA: Building An Affective Pathway To The Geosciences Through Experiential Learning Opportunities For Non-Geoscience Majors	47.RD	1540702	-	76,198

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Schedule of Expenditures of Federal Awards

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Federal Grantor/Pass-through Grantor/Program Title	Federal CFDA Number	Pass-through Entity Identifying Number	Passed Through to Subrecipients	Total Federal Expenditures
RESEARCH AND DEVELOPMENT CLUSTER, Continued				
National Science Foundation, continued				
Graduate Research Fellowship Program	47.RD	1246875	-	132,667
Graduate Research Fellowship Program	47.RD	DGE-1246875	-	63,271
Graduate Research Fellowship Program (GRFP)	47.RD	1246875	-	45,821
Graduate Student Combinatorics Conference 2016	47.RD	1600767	-	13,539
Growth Rates of Bacterial Taxa in Coastal Marine Ecosystems	47.RD	OCE-1261359	40,932	94,846
GSE/RES: Impact of Single-Sex Public Educational Environments on Mathematics and Science Classroom Environment Student Academic Performance and Student Self-Concept	47.RD	HRD-1136248	-	31,325
Highly Conductive Reduced Graphene Oxide Films for High Performance Electronic Devices	47.RD	1538215	6,160	57,090
High-Strength Carbon Fibers from Eco-Friendly Processing of Biomass	47.RD	1462804	-	47,811
Hilbert Spaces of Analytic Functions and Their Applications	47.RD	DMS-1304208	-	2,034
How Does the Plant Say-No More?: A Molecular Genetic Approach to Nodule Number Regulation	47.RD	IOS-1146014	-	87,954
I/UCRC FRP: Collaborative Research: The Physical Internet for a Sustainable Logistics Future - Advancing CELDI's Leadership Position	47.RD	IIP-1332007	-	810
I/UCRC Phase II: Collaborative Research: Ceramic Composite and Optical Materials Center	47.RD	1540025	-	32,220
I/UCRC: Collaborative Research: Center for Excellence in Logistics and Distribution Phase II	47.RD	1266013	-	49,970
I-Corps Team: Ultra Dielectric Probes	47.RD	1539688	-	32,981
I-Corps Teams: Membrane Adsorbers for Biologics Purification	47.RD	1556563	-	44,936
II NEW: Infrastructure to Support Research in Network-Aware Data-Intensive Computing	47.RD	CNS-1405767	-	39,098
III: Small: Collaborative Research: Privacy-Aware Collaborative Data Sharing in Human-Centered Social Networks	47.RD	1527421	-	13,644
Impact of Nonmigrating Tides on the Thermospheric Energy Budget and Constituents	47.RD	AGS-1112704	36,803	66,561
INSPIRE: Intentional Defaults For More Sustainable Infrastructure: Studying Interventions To Alleviate Biases In Upstream Multi-Stakeholder Decisions	47.RD	1531041	2,734	35,382
INSPIRE: Evaluating the Effect of Cyberinfrastructure on Universities Production Process	47.RD	SMA-1243436	-	94,339
Instrument Development: Ultra-Sensitive Single-Pass Electron Paramagnetic Resonance Spectrometers	47.RD	CHE-1152892	-	27,976
International Collaboration in Chemistry: Preparation and Utilization of SF5-Containing Building Blocks	47.RD	CHE-1124859	-	(1,854)
IRES: Call Me Globber-Under-represented Undergraduate Bioengineering Research in Singapore	47.RD	1460110	-	49,900
IUSE: EHR: Enabling Field Experiences in Introductory Geoscience Classes Through the Use of Virtual Reality	47.RD	1504619	-	117,406
Material Removal and Ejection Dynamics in Femtosecond Laser Machining of Microchannels in Transparent Materials	47.RD	1563426	-	34,294
Materials World Network: Switchable Polymer Interfaces for Bottom-Up Stimulation of Mammalian Cells	47.RD	DMR-1107786	20,117	20,117
MCA-PGR: Spatial and Temporal Resolution of mRNA Profiles During Early Nodule Development	47.RD	1444461	-	189,245
Mechanism for Heterogeneously Catalyzed Sugar Alcohol Reactions: Hierarchical Modeling and Experimental Studies	47.RD	CBET-1438325	-	131,440
Mechanisms of Fluid Feeding in Insects from Nanoscale to Organism	47.RD	IOS-1354956	40,453	204,114
Modeling of the Subgrid-Scale Pressure-Strain-Rate Correlation in the Atmospheric Surface Layer	47.RD	AGS-1335995	-	88,426
Molecular Dynamics Simulations and Small Angle Neutron Scattering Studies of Light-Emitting Polymeric Nanoparticles	47.RD	CHE-1308298	-	127,070
MRI: Acquisition of High Performance Computing Instrument for Collaborative Data-Enabled Science	47.RD	CNS-1228312	-	7,000
Multimodal Membranes for High-Throughput Bioseparations	47.RD	1159622	-	104,063
Multi-Scale Fundamental Investigation of Sintering Anisotropy	47.RD	CMMI-1502392	-	220,055
Network Target Coordination for Complex System Optimization	47.RD	CMMI-1129969	-	(44)
New Methods for Studying the Time-Dependent and Steady-State Behavior of Markov Chains	47.RD	CMMI-1435261	-	82,409
Novel Graphene-based Label-free Biosensor Array for Smart Health and Drug Discovery	47.RD	1606882	76	225
Novel Optical Hosts: Chemistry Single Crystal Growth and Applications	47.RD	DMR-1410727	-	100,873
NSF BPC-A: Institute for African-American Mentoring in Computing Sciences (iAAMCS)	47.RD	CNS-1303156	-	(565)
NSF IPA	47.RD	1523314	-	132,167
NSF IPA	47.RD	AGS-1557472	-	152,761
NSF/DOE Partnership on Advanced Combustion Engines: Thermal Barrier Coatings for the LTC Engine - Heat Loss Combustion Thermal vs. Catalytic Effects Emissions Exhaust Heat	47.RD	1258714	101,856	320,520
Numerical Methods for Non-Newtonian Fluid Structure Interaction Problems	47.RD	DMS-1418960	-	28,471
On a General Class of Count Time Series Models	47.RD	DMS-1407480	-	34,013
Optical Carrier Based Microwave Interferometry for Spatially Continuous Distributed Monitoring of Structural Health	47.RD	CMMI-1359716	-	71,961
PFI: AIR Technology Translation - Functionalized III-V Nitride Based Microelectromechanical Sensors for Neutron Detection	47.RD	1512342	-	437
PFI: AIR Technology Translation - Functionalized III-V Nitride Based Microelectromechanical Sensors for Neutron Detection	47.RD	IIP-1512342	-	116,143

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Schedule of Expenditures of Federal Awards

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RESEARCH AND DEVELOPMENT CLUSTER, Continued				
National Science Foundation, continued				
PFI: AIR - TT: Novel Low-Power III-Nitride Heater Cantilever Based Selective VOC Sensor	47.RD	1602006	-	1,844
Quantitative Structure-Adsorbability Relationships for the Adsorption of Organic Chemicals by Carbon Nanotubes	47.RD	CBET-0967425	-	(773)
RAPID: Extreme Flooding Mobilized Natural Organic Matter from Forested Wetlands - Implication of Mercury and Carbon Cycling in Coastal Blackwater Rivers	47.RD	1617040	-	8,147
RAPID: Response to the MTBE Spill Port of Houston Texas, March 2015	47.RD	1542727	-	34,428
RAPID: Responses of Different Tree Species to a Severe Ice Storm in the Southeastern United States	47.RD	DEB-1442131	-	30,968
RAPID: Severe Drought and Historical Extreme Flood (October 1-4, 2015) Regime in South Carolina: Assessment of the Water Quality Situation	47.RD	1602451	-	24,765
REU Site: Solid-State Devices for Electronics Photonics and Magnetics Technology	47.RD	EEC-1262991	-	43,041
REU Site: Undergraduate Research in Collaborative Data Visualization Applications	47.RD	ACI-1359223	-	35,247
REU Site: Data-Intensive Computing	47.RD	OCI-1263180	-	40,933
REU Site: Interfaces and Surfaces	47.RD	1460863	-	106,238
REU site: Undergraduate Research in Biological Sciences: From Genomes to Phenomes - Exploring Function Across Scales	47.RD	1460895	-	69,037
RI: Small: Interactive Perception for Manipulating Non-Rigid Objects	47.RD	IIS-1017007	-	(204)
RI: Small: Vine-Like Continuum Robots	47.RD	1527165	343	29,426
Role of Cell Volume Changes in Mechanotransduction of Hydrostatic Pressure	47.RD	CBET-1264579	-	34,571
Scalable Intelligent Power Monitoring and Optimal Control of Distributed Energy Systems Using Adaptive Critics	47.RD	ECCS-1308192	-	122,188
Scholars Awards: The Schlick Zirkel	47.RD	1456582	-	68,497
Selenium Antioxidant Mechanisms: Metal Binding vs. Reactive Oxygen Species Scavenging	47.RD	CHE-1213912	-	52,957
Self-Healing Photochromic Polymeric Coatings	47.RD	CMMI-1332964	-	211,471
SHB: Small: An Assistive, Robotic Table [ART] Promoting Independent Living	47.RD	IIS-1116075	-	9,652
SHB: Type II (INT): Collaborative Research: Creating Learning Systems with Mobile Technology to Improve Perioperative Services	47.RD	IIS-1237077	-	217,342
SHF: Medium: Collaborative Research: Specification and Mathematics Engineering for the Verified Software End-Game	47.RD	CCF-1161916	-	59,913
SNM: Defect-Engineered Nanocarbons for Electrochemical Energy Storage	47.RD	CMMI-1246800	41,148	244,346
Southeastern Number Theory Meetings	47.RD	1502293	-	12,212
Spider Orb-Web Inspired Cognitive Fault-Tolerant Fiber Optic Sensor Network for SHM Under Harsh Conditions	47.RD	CMMI-1360664	-	148,747
Supporting a Community Building Workshop in Computer Education Research	47.RD	DUE-1355395	-	3,031
Topics in Algebraic Geometry Codes	47.RD	DMS-1403062	-	50,046
Transforming Robust Design Concept into a Novel Geotechnical Design Tool	47.RD	CMMI-1200117	-	84,779
TUES Type 1: Robots in Business and Society - A Hands-On Learning Experience	47.RD	DUE-1245250	-	28,641
TUES: Collaborate Research: Integrating Sustainability Grand Challenges and Experiential Learning into Engineering Curricula	47.RD	1620922	-	5,984
TWC: Medium: Collaborative: Studying Journalists to Identify Requirements for Usable Secure and Trustworthy Communication	47.RD	1513875	-	52,271
Ultrasonic Particle Scrubbing With Drops	47.RD	1336632	-	74,372
Understanding and Manipulating Charge and Entropy Flows in Layered Structured Transition Metal Dichalcogenides by and for Thermoelectricity: A Multi-Scale Materials Chem. Approach	47.RD	DMR-1307740	-	78,481
Understanding the Macroscopic Dynamics of Ultrasonic Consolidation	47.RD	CMMI-1068977	-	25,091
UNS: Formation and Toxicity of Disinfection Byproducts in Desalinated Waters	47.RD	1511051	7,651	53,359
UNS: High-performance Membranes for Engineered Osmosis	47.RD	1510790	-	75,634
US Ignite: Track 1: Enabling Connected Vehicle Applications through Advanced Network Technology	47.RD	1531127	-	189,350
Using Ultra Violet Light to Produce Layered Fiber Reinforced Materials Derived from Biological Sources	47.RD	1537756	-	47,794
Workshop: Engineering Design and Systems Engineering Foundations: Clemson University Clemson South Carolina November 14-17 2015	47.RD	1550242	-	49,490
Pass-through programs from:			-	-
BBN Technologies			-	-
GENI WiMAX at Clemson	47.RD	1843/PO# 9500011083	-	4,484
GENI WiMAX at Clemson - REU Supplement	47.RD	1843/PO#9500011083 14303/PO# 9500012170/	-	695
GENI: Experimenting with Persistent Live Video Streaming Service	47.RD	1931B	-	89,736
Carnegie Mellon University			-	-
Learning to See Seeing to Learn: A Sociotechnical System Supporting Taxonomic Identification Activities in Volunteer-Based Water Quality Biomonitoring	47.RD	1122371-358369	-	32,087
Clemson University Research Foundation			-	-
Synthesis-Microstructure-Performance Relations in Oxide Ceramic Scintillators	47.RD	DMR-1207080	-	95,372
CAREER: Control of Processes Actuated with Mobile Radiant Sources	47.RD	CMMI-1055254	-	51,569

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RESEARCH AND DEVELOPMENT CLUSTER, Continued				
National Science Foundation, continued				
Pass-through programs from, continued:				
Clemson University Research Foundation, continued				
CAREER: Model-Based Control of Machining Processes and Scalability for Manufacturing System Control	47.RD	CMMI-0954318	-	94,882
Del Mar College		Stamp project NSF		
Simulations to Support FAA Part 147 Aviation Maintenance Training	47.RD	DUE # 1205021	-	12,301
Florida Atlantic University				
MRI - Development of the Intelligent River: A Basin-Scale Monitoring Instrument	47.RD	CRJ85	-	215,002
Indiana University				
SHB: Small Privacy-Enhanced Technologies to Support Underserved Older Adults Age In Place	47.RD	BL-4848754-CLEM PO 1346972	-	4,526
Kennesaw State University				
Scholarly Inquiry and Practices (SIP) Conference for Mathematics Education Methods	47.RD	150167-01	-	4,876
Livingstone College				
Advancing Interest and Motivation (AIM) for STEM Careers	47.RD	NSF HBCU-UP	-	(704)
Medical University of South Carolina				
Structure and Dynamics of the Spider Dragline Silk Assembly Process	47.RD	MUSC11-106	-	5,497
Missouri University of Science and Technology				
Nano Ferrous Particles Dispersed on Optical Fiber Sensors for Distributed Corrosion Assessment of Civil Infrastructures	47.RD	00037853-01	-	42,293
Northwestern University				
DMREF: Simulation-Driven Design of Highly Efficient MOF/ Nanoparticle Hybrid Catalyst Materials	47.RD	SP0023246-PROJ0006614	-	53,243
South Carolina State University				
A Partnership in Observational and Computational Astronomy (POCA)	47.RD	08-586009-BAPS-CU-SC	-	4,177
A Partnership in Observational and Computational Astronomy II (POCA II)	47.RD	15-586021-BAPS-CU-SC	-	5,687
Louis Stokes Alliance for Minority Participation Program (SCAMP)	47.RD	13-581099-SCAMP-CU-SC 15(2)-581051-	-	6,698
Louis Stokes Alliance for Minority Participation Program (SCAMP)	47.RD	SCAMP-CU-SC	-	14,895
Louis Stokes Alliance for Minority Participation Program (SCAMP)	47.RD	15-581051-SCAMP-CU-SC	-	39,326
Tetramer Technologies				
Commercialization of Innovative Low Refractive Index High Temperature Perfluorocyclobutyl Polymers	47.RD	CU-TETRAMER NSF-006	-	54,987
University of California Davis				
Geoinformatics: Facility Support: Computational Infrastructure for Geodynamics	47.RD	200911281-06	-	27,823
University of Florida				
NSF INSPIRE: Virtual Environment Interactions: Exploring Embodied Learning in Support of Computational Thinking	47.RD	UFDSP00010994	-	166,384
University of San Diego				
Collaborative Research: Military Veteran Students' Pathways in	47.RD	140065-U2015-001	-	18,881
University of South Carolina				
The South Carolina Project for Organ Biofabrication - Bioprinting Pre-Vascularized Tissue Engineering Constructs	47.RD	15-2838 22410-Z142 13-2357 22410-Z117	-	45,571
The South Carolina Project for Organ Biofabrication - Research Infrastructure Improvement (RII) Track Grant	47.RD	PO#52297L, 2000007303	-	99,999
The South Carolina Project for Organ Biofabrication - Undergraduate Research Opportunities for Women in Biomolecular Engineering	47.RD	16-3100/PO#2000025995 (22410-ZH16)	-	5,000
University of Texas Austin				
Campus Bridging for Stampede	47.RD	UTA13-000068	-	77,418
Sequencing a Reference-grade Genome of the Domesticated Allotetraploid Cotton	47.RD	UTA15-000467 (1444552)	-	129,682
University of Utah				
CloudLab: Flexible Scientific Infrastructure to Support Fundamental Advances in Cloud Architectures and Applications	47.RD	10034358-CLEM	-	1,142,901
University of Washington				
CREATIV:Tools Models and Innovation Platforms for Research on Social Media	47.RD	UWSC6767; PO# BPO11291 (formerly 7425278)	-	12,713
Washington State University				
CIF21 DIBBS Tripal Gateway: Platform for Next Generation Data Analysis and Sharing	47.RD	123507_G003405	-	129,002
Total National Science Foundation	47.RD		<u>1,937,638</u>	<u>17,250,693</u>
Department of Veterans Affairs				
Nanoparticle Coupled Antioxidants for Respiratory Illness in Veterans	64.RD	VA 247-P-1705	-	30,000
Total Department of Veterans Affairs	64.RD		<u>-</u>	<u>30,000</u>

The accompanying notes are an integral part of this schedule

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RESEARCH AND DEVELOPMENT CLUSTER, Continued				
Environmental Protection Agency				
Dendritic Polymers as Biocompatible Dispersants for Oil Spill Remediation	66.RD	RD-83518201	58,782	90,790
Partnerships for Sustainability: P2 Education and Assessment	66.RD	NP00D22514	-	18,935
Forest Watershed Management Practices & DW Quality	66.RD	CR-83586401	30,396	186,287
Pass-through programs from:				
North Carolina State University				
Achieving New Milestones For Stormwater Runoff Reductions in Black	66.RD	2012-2709-01	-	9,520
Total Environmental Protection Agency			<u>89,178</u>	<u>305,532</u>
Nuclear Regulatory Commission				
Clemson University Nuclear Engineering and Radiological Sciences Scholarship Program	77.RD	NRC-HQ-84-14-G-0021	-	34,255
Probabilistic Risk Assessment Faculty Development in Nuclear Engineering and Science				
Program at Clemson University	77.RD	NRC-HQ-13-G-38-0002	-	119,053
US NRC Fellowship Grant at Clemson University	77.RD	NRC-HQ-12-G-38-0016	-	93,741
Total Nuclear Regulatory Commission			<u>-</u>	<u>247,049</u>
Department of Energy				
A New Paradigm for Understanding Multi Phase Ceramic Waste Form Performance	81.RD	DE-NE0008260	124,821	276,280
Alternative Sample Loading Preparation for Thermal Ionization Mass Spectrometry	81.RD	DE-NA0001735	-	158,302
Breeding High Yielding Bioenergy Sorghum for the New Bioenergy Belt	81.RD	DE-AR0000595	682,977	1,121,872
Characterizing and Interpreting the In Situ Strain Tensor During CO2 Injection	81.RD	DE-FE0023313	111,731	360,422
Clemson University's Solar Decathlon 2015: A Techno-Local Solar House for South Carolina	81.RD	DE-EE0006559	-	11,066
Clemson University's Synchrotron Engineering Education Program (CU-ShEEP)	81.RD	DE-OE0000660	-	1,471
Examination of Actinide Chemistry at Solid-Water Interfaces to Support Advanced Actinide Separations	81.RD	DE-SC0010355	-	222,743
Fellowship and Scholarship Support	81.RD	DE-NE0000125	-	13,800
First-Principles Calculation of Vibrational Mode in Complex Materials	81.RD	DE-SC0008487	-	116,523
From Interfaces to Bulk: Experimental - Computational Studies Across Time and Length Scales of Multi Functional Ionic Polymer	81.RD	DE-SC0007908	-	21,693
Functionally Designed Ultra-Lightweight Carbon Fiber Reinforced Thermoplastic Composites Door Assembly	81.RD	DE-EE0007293	39,514	258,585
High Temperature Melt Solution Calorimeter: The Thermodynamic Characterization of Oxides in Nuclear Energy	81.RD	DE-NE0008387	-	325,000
Lower Length Scale Characterization and Validation of Formation and Stability of Helium Bubbles in Nano-structured Ferritic Alloys Under Irradiation	81.RD	DE-NE0000728	-	77,431
Novel High Temperature and Radiation Resistant Infrared Glasses and Optical Fibers for Sensing in Advanced Small Modular Reactors	81.RD	DE-NE0000727	66,129	168,504
Radionuclide Waste Disposal: Development of Multi-scale Experimental and Modeling Capabilities	81.RD	DE-SC0012530	548,829	1,874,439
Rigid Nanostructured Organic Polymer Monolith for In Situ Collection and Analysis of Plant Metabolites from Soil	81.RD	DE-SC0010832	-	44,205
Robust Extractive Scintillating Resin and Adsorptive Membranes for Plutonium Isotopic Analyses of Aqueous Media	81.RD	DE-NA0002920	-	30,066
Sampling Rare Events In Aqueous Systems Using Molecular Simulations	81.RD	DE-SC0015448	-	13,792
Synthesis and Single Crystals of Refractory Oxides of Lanthanides and Thorium	81.RD	DE-SC0014271	-	134,594
Pass-through programs from:				
Battelle				
Literature Review - Impact of Light on Health Outcomes	81.RD	267291	-	31,250
R&D of the Liquid Sampling, Atmospheric Pressure Glow Discharge (LS-APGD) with Respect to Uranium Sensitivity and Isotope Ratio Accuracy	81.RD	302206	-	6,977
R&D of the Liquid-Sampling Atmospheric-Pressure Glow Discharge (LS-APGD)	81.RD	228064	-	63,436
Battelle Memorial Institute				
Round Robin Testing of Alkali-Silica Reactivity of Aggregates using Autoclaving Techniques	81.RD	488440 // PO# US001-0000488440	-	31,675
Clemson University Research Foundation				
Development of a Self-Consistent Model of Plutonium Sorption: Quantification of Sorption Enthalpy and Ligand-Promoted Dissolution	81.RD	DE-SC0004883	22,149	46,819
Fluoropolymers, Electrolytes, Composites and Electrodes	81.RD	DE-FG02-05ER15718	-	59,290
GATE Center of Excellence in Sustainable Vehicle Systems	81.RD	DE-EE0005571	-	76,884
Quantification of Cation Sorption to Engineered Barrier Materials Under Extreme Conditions	81.RD	120716	5,850	44,217
Donald Danforth Plant Science Center				
A Reference Phenotyping System for Energy Sorghum	81.RD	22815-C	-	69,163
Lawrence Livermore National Laboratory				
Stabilization of Pu surface Complexes on Mineral Colloids by Natural Organic Matter	81.RD	B610134	-	53,095
Stabilization of Pu surface Complexes on Mineral Colloids by Natural Organic Matter	81.RD	B616830	-	45,315

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RESEARCH AND DEVELOPMENT CLUSTER, Continued				
Department of Energy, continued				
Pass-through programs from, continued:				
Los Alamos National Laboratory				
Evaluate, Develop and Implement Robust and Scalable Approaches for Computing both Explicit and Compact Finite Differences for Computational Fluid Dynamics (CFD)	81.RD	325755 // BOA# 284874	-	18,542
Missouri University of Science and Technology				
Additive Manufacture of Smart Parts with Embedded Sensors for In-Situ Monitoring in Advanced Energy Systems	81.RD	00042083-01	-	112,438
Robust Ceramic Coaxial Cable Down-Hole Sensors for Long-Term in Situ Monitoring of Geologic CO2 Injection and Storage	81.RD	00046435-01	-	328,027
MWH Americas, Incorporated				
Laboratory Evaluation of Biostimulation to Treat Chlorinated Ethenes in the Chatsworth Formation Santa Susana Field Laboratory Ventura County CA	81.RD	S10504105-101050-OF // Job# 10508425	2,965	3,910
Robert Bosch, LLC				
Recirculated Exhaust Gas Intake Sensor (REGIS) Enabling Cost-Effective Fuel Efficiency Improvement	81.RD	DE-EE0005975-001	-	70,893
Sandia National Laboratories				
Biaxial Orientation Studies of Nitrated PET-based films	81.RD	1553215	-	954
Sandia Small Grant	81.RD	1556303	-	25,523
SCUREF				
Advanced Microanalytical Measurements	81.RD	B139023	-	22,800
Anion Exchange Membranes Application	81.RD	B139012	-	35,787
Ceramic Materials Synthesis and Characterization	81.RD	B139010	-	1,952
Ceramic Materials Synthesis and Characterization	81.RD	B139015	-	47,911
Examination of the Electrical Properties of Micro- and Nano-Scale Properties in Weak Electrostatic Fields	81.RD	B139002	-	33,959
Fabrication and Characterization of Graphene Membranes	81.RD	B139021	-	125,560
MDOA and TEA Resins Development	81.RD	B139025	-	27,503
On-Site Two-Day Workshop	81.RD	B139028	-	12,858
Radiation Detection Research and Development in Accordance with SOW No. G-SOW-A-01422, REV. 0	81.RD	B139019	-	96,311
SRNS SCM Asset Management Operational Improvements	81.RD	B139009	-	3,370
SRR Technical Support Provided by Clemson University	81.RD	SRRA001	-	94,827
		SRRA002 //		
SRR Technical Support Provided by Clemson University	81.RD	TOA# SRRA042328	85,268	95,589
Tritium Supply Chain Modeling & Analysis	81.RD	B139020	-	124,445
Water Isotope Separation Testing	81.RD	B139024	-	80,431
University of Minnesota				
Energy Frontier Research Center for Inorganometallic Catalyst Design	81.RD	A004527501	-	102,137
University of Nebraska - Lincoln				
Systems Analysis of the Physiological and Molecular Mechanisms of Sorghum Nutrient Use Efficiency Water Use Efficiency and Interactions with the Soil Microbiome	81.RD	25-1215-0123-006	-	75,936
University of Washington				
TA(A) Precursor-Derived Nanostructured Si-C-X Materials from MHD Electrode Application	81.RD	BPO9757 (formerly 763094)	-	81,935
US Automotive Materials Partnership LLC				
Development of Advanced Steel for Lightweight Vehicles	81.RD	13-2825-AMP	-	160,464
UT-Battelle LLC				
The Public Charging Business Decisions (PCBD) Tool	81.RD	4000140494	-	9,582
Wireless Power Transfer (WPT) and Charging of Plug-In Electric Vehicles	81.RD	4000119528	-	46,545
Robust Network Fusion Algorithms for Detection and Localization of Radiation Sources	81.RD	4000127400 / Vendor # 0000062498	-	78,862
Total Department of Energy	81.RD		1,690,233	7,677,960
Department of Education				
GAANN: Model Validation Analytics in Support of High Consequence Decision Making	84.RD	P200A150310	-	98,235
Graduate Fellowship in Electrical & Computer Engineering	84.RD	P200A150107	-	24,350
Graduate Fellowships in Electrical and Computer Engineering	84.RD	P200A120224-13	-	131,392
Graduate Training in Engineering and Managing Resilient and Sustainable Civil Infrastructure	84.RD	P200A120222-14	-	228,453
PD12/Orangeburg School District 3/Professional Development for Integrated Inquiry	84.RD	None	-	(29,000)
Pass-through programs from:				
South Carolina Commission on Higher Education				
ITQ - Understanding Geometry by Design	84.RD	None	-	8,812
Project HOMS: Hands-On Making Science	84.RD	None	-	60,632

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RESEARCH AND DEVELOPMENT CLUSTER, Continued				
Department of Education, continued				
Pass-through programs from, continued:				
South Carolina Commission on Higher Education, continued				
Project RES: Reform-Based Environmental Science - ITQ FY 2015-16	84.RD	ITQ 2015-16	-	76,348
Total Department of Education			-	599,222
Department of Health and Human Services				
A Multi-Level, Cohort-Sequential Study of Rural Adolescent Dating Violence				
Victimization and Perpetration	93.RD	5R01HD067505-03	54,409	182,755
Adaptive Wavefront Generation and Correction for Super-high Resolution Microscopy	93.RD	7R21GM104683-02	-	20,898
Biomechanical Characterization and Modeling of Human TMJ Disc	93.RD	5F31DE023482-02	-	6,500
Center of Biomaterials for Tissue Regeneration (CBTR)	93.RD	5P20GM103444-08	394,181	1,300,358
Center of Biomaterials for Tissue Regeneration (CBTR) - A Simionescu	93.RD	5P20GM103444-08	-	193,722
Center of Biomaterials for Tissue Regeneration (CBTR) - Y. Mei	93.RD	5P20GM103444-08	-	206,717
Center of Biomaterials for Tissue Regeneration (CBTR) (D Simionescu, Z Gao, & T Bruce)	93.RD	5P20GM103444-08	-	222,960
Center of Biomaterials for Tissue Regeneration (CBTR) (J Anker & J Desjardins)	93.RD	5P20GM103444-08	-	184,891
Center of Biomaterials for Tissue Regeneration (CBTR) (J Nagatomi & C Webb)	93.RD	5P20GM103444-08	-	263,776
Center of Biomaterials for Tissue Regeneration (CBTR) (JS Lee)	93.RD	5P20GM103444-08	-	234,555
COBRE: Eukaryotic Pathogens Innovation Center (EPIC)	93.RD	1P20GM109094-01A1	-	153,845
DelPhi: Software for Electrostatic Modeling of Biomolecules	93.RD	5R01GM093937-05	46,767	188,702
Developing Luminescent Tension-indicating Orthopedic Screw	93.RD	1R21EB019709-01A1	-	103,153
Does Arsenic Target Border Specific Cells During Embryogenesis?	93.RD	5R03ES023065-02	-	8,030
Embryonic Arsenic Exposure Impacts Satellite Cells	93.RD	1R03ES023930-01A1	-	57,766
Entamoeba Metabolism: The Role of Acetate Kinase and ADP-Forming Acetyl-CoA Synthetase	93.RD	1R15GM114759-01A1	-	39,803
Integrating Biomechanics & Cell Biology to Understand TMJ Pathology	93.RD	4R01DE021134-05	224,474	380,335
Investigating Mechanism of Intracellular Rotational Transport with Optical T	93.RD	1R15EB014560-01A1	-	30,476
Label Free RF Imaging of Cell Membrane Heterogeneity in Liquid	93.RD	4K25GM100480-05	6,116	166,032
Microfabricated Coculture Model: Myocyte Rescue by TNT-Transfer Mitochondria	93.RD	5R01HL124782-03	193,574	429,437
Naturally Occurring Dog Model for Juvenile Dermatomyositis	93.RD	1R15AR062868-01A1	-	74,666
New Generation DelPhi: large systems and beyond electrostatics	93.RD	2R01GM093937-06A1	-	60,198
Nutrient Sensing and Hexokinases in T. brucei	93.RD	2R15AI075326-02 revised	-	19,020
Phage Display Selection of Antiangiogenic CMG2 Cyclic Peptide Antagonists	93.RD	1R21EY024734-01	23,861	23,861
Predicting the Toxicity of Nanomaterials by a Transforming Protein Corona	93.RD	1R15ES022766-01A1	71,720	221,521
Probe Identification by HTS for Plasmodium Falciparum Hexokinase	93.RD	1R03HD081723-01	12,309	100,132
Realizing Improved Patient Care Through Human-Centered Design in the OR	93.RD	1P30HS024380-01	111,065	642,889
Reducing Disparities in Birth Outcomes: A Randomized Controlled Trial on Centering Pregnancy	93.RD	5R01-HD82311-02	55,053	203,580
Role of Mei5-Sae3 in Meiotic Homologous Recombination	93.RD	5R01GM098510-05	-	219,183
Stress Induced Control of Protein Translation in Entamoeba Histolytica	93.RD	1R03AI107950-01A1	-	28,449
The Cell Biology of Eukaryotic Pathogen Symposium	93.RD	1R13AI118215-01	-	5,000
The Role of CAR and PXR in Gender Predominant P450 Expression and Induction	93.RD	2R15ES017321-02	-	65,997
Tissue Engineered Repair of Cranial Facial Muscle	93.RD	5F31DE022224-02	-	1,608
Translational Control of Encystation in the Entamoeba	93.RD	5R21AI08287-02	21,254	124,921
Undergraduate Education and Device Innovation Through Clinical and Translational Using Context to Validate and Improve Wrist-Tracking	93.RD	1R25EB016589-01A1	-	41,065
	93.RD	5R01HL118181-02	122,162	603,321
Pass-through programs from:				
Bite Technologies, LLC				
Assessing the Bite Counter as a Tool for Food Intake Monitoring: Phase II	93.RD	CU-02	-	84,156
Brigham Young University				
pH and Glucose Sensing In Trypanosoma Brucei Glycosomes	93.RD	15-0462 R0102071	-	38,848
Duke University				
Inflammasomes Mediate Inflammations in Bladder Outlet Obstruction	93.RD	2034859	-	21,153
Greenville Health System				
Evaluation Birth and Maternal Outcomes of South Carolina Centering Pregnancy Expansion Project	93.RD	A201510666A // Grant # G001615	-	38,676
Neonatal Abstinence Syndrome: Analysis of Cost Safety and Efficacy of a Palliative Approach to Treating Narcotic-Dependent Newborns	93.RD	A20161164A-01GHS // G001216	-	161,510
Greenwood Genetics Center				
Rett Syndrome Hand Stereotypies Data Analysis Study	93.RD	82561-03	-	4,156
Medical University of South Carolina				
Elucidating Vertebral Microstructure with Diffraction Enhanced Imaging	93.RD	MUSC15-013/PO #198989	-	11,777
Methods for Retrospective Multi-Site Research	93.RD	MUSC12-046	-	38,979
MUSC Center for Oral Health Research	93.RD	MUSC15-093	-	2,159
Physical Activity Interventions for Leg Ulcer Patients	93.RD	MUSC15-041	-	63,981
Missouri University of Science and Technology				
Development of a Novel Multi-functional Single Cell Analyzer	93.RD	00044240-01	-	59,756

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RESEARCH AND DEVELOPMENT CLUSTER, Continued				
Department of Health and Human Services, continued				
Pass-through programs from, continued:				
North Carolina Central University				
Development of New Photo-Activated Antibacterial Agents NUBAD, LLC.	93.RD	P0069772	-	26,071
		2013000548; F-Neo II		
A Rapid Assay for RNA Targeted Drugs	93.RD	(5R42GM097917-03)	-	164,685
Development of Peptide Antibiotic Nucleic Acids	93.RD	Prime # 5R41A1114114-02	-	96,227
Rutgers, The State University of New Jersey				
Multiscale Molecular Modeling as Guide for Bioactive Polymer Design Optimization	93.RD	5673/ PO S2212410	-	93,349
Multiscale Molecular Modeling as Guide for Bioactive Polymer Design Optimization	93.RD	5945-439828-52384384	-	8,420
South Carolina Department of Agriculture				
South Carolina Farm to School Evaluation	93.RD	None	961	5,790
South Carolina Department of Health & Human Services				
Quality Assurance Services for the Bureau of Long Term Care Services (FFP Federal)	93.RD	A201611999A (FFP)	-	485,969
Quality Assurance Services for the Bureau of Long Term Care Services (Prime Federal)	93.RD	A201611999A Prime	-	262,182
South Carolina Department of Social Services				
ICSS Employment and Training	93.RD	4400011567	-	1,209,395
ICSS Employment and Training	93.RD	Task Order #4	-	768,941
The University of Texas Health Science Center				
Structure and Function of NMDA Receptors	93.RD	0011279B	-	24,101
University of Colorado - Denver				
Mechanisms of Mast Cell Directed Carbon Nanotube Toxicity	93.RD	FY16.714.002	-	74,699
Nanoparticle Protein Corona Structural Changes and Immunoreactivity	93.RD	FY15.714.001/2-5-55932	-	40,039
University of South Carolina				
		PO#91635(18190-FJ33)/		
Palmetto State Geriatric Education Center	93.RD	15-2753	-	(1)
South Carolina IDeA Network of Biomedical Research Excellence (INBRE)	93.RD	16-3022	-	9,425
South Carolina IDeA Network of Biomedical Research Excellence (SC INBRE)	93.RD	22050-Z188	-	188,790
University of Texas Austin				
A Novel Approach for the Design and Development of Valvular Replacement Biomaterials	93.RD	UTA12-000570	-	59,879
University of Texas El Paso				
BUILDing Scholars-Research Enrichment Core	93.RD	226141170-04	-	24,421
Virginia Polytechnic Institute				
DPM Research: Monitoring Responses to Ventilation and Control by Water Sprays and Capacity Building for Mine Ventilation Expertise	93.RD	431827-19244	-	21,864
Widmeyer Communications				
Phase V, Option Year III (previously Option Year II) of HRSA's Bullying Prevention Campaign	93.RD	None	-	74,426
Total Department of Health and Human Services			<u>1,337,906</u>	<u>10,973,945</u>
Corporation for National and Community Service				
Pass-through programs from:				
Furman University				
Implementation Evaluation for Greenville Health System School Based Health Centers	94.RD	None	-	841
Total Corporation for National and Community Service			<u>-</u>	<u>841</u>
Department of Homeland Security				
Pass-through programs from:				
University of South Carolina				
Coupling Experiments and Atomistic Modeling to Characterize Actinide Oxides in Support of Nuclear Forensics	97.RD	14-2646/17110 FA45 PO#'s 82368, 2000017843	-	108,521
Total Department of Homeland Security			<u>-</u>	<u>108,521</u>
United States Agency for International Development				
Mechanisms of Fluconazole-Induced Aneuploidy in Cryptococcus Neoformans	98.RD	1R15 AI119801-01	-	61,733
Total United States Agency for International Development			<u>-</u>	<u>61,733</u>
Total Research and Development Cluster			<u>7,484,692</u>	<u>61,002,357</u>

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STUDENT FINANCIAL ASSISTANCE CLUSTER				
Department of Education				
Federal Supplemental Educational Opportunity Grants	84.007		-	355,123
Federal Work Study Program	84.033		-	1,010,807
Federal Work Study Program - Federal Job Location and Development	84.033		-	50,000
Federal Perkins Loan Program Federal Capital Contributions	84.038		-	8,783,145
Federal Pell Grant Program	84.063		-	13,607,628
Federal Direct Student Loans	84.268		-	93,681,098
Total Department of Education			-	117,487,801
Total Student Financial Assistance Cluster			-	117,487,801
SNAP CLUSTER				
Department of Agriculture				
Pass-through programs from:				
South Carolina Department of Social Services				
SC DSS SNAP Outreach Grant	10.561	4400010995	80,880	99,900
SC DSS SNAP Outreach Grant	10.561	4400009903	148,125	169,904
SNAP-ED Nutrition Education and Obesity Prevention Grant	10.561	4400010959	-	329,350
SNAP-ED Nutrition Education and Obesity Prevention Grant	10.561	44400009904	-	124,691
Total Department of Agriculture			229,005	723,845
Total SNAP Cluster			229,005	723,845
ECONOMIC DEVELOPMENT CLUSTER				
Department of Commerce				
United States Department of Commerce EDA Grant for the CURI Graduate Education Center	11.300		-	3,982,605
Total Department of Commerce			-	3,982,605
Total Economic Development Cluster			-	3,982,605
COMMUNITY DEVELOPMENT BLOCK GRANTS CLUSTER				
Department of Housing and Urban Development				
Pass-through programs from:				
City of Columbia				
Ice House Entrepreneurship Program	14.218	2015-CDBG-03-1184	-	44,321
Total Department of Housing and Urban Development			-	44,321
Total Community Development Block Grants Cluster			-	44,321
HIGHWAY PLANNING AND CONSTRUCTION CLUSTER				
Department of Transportation				
Pass-through programs from:				
South Carolina Department of Transportation				
State Work Zone Safety Training Program	20.205	CBSA-002 1671; Proj	-	271,609
Transportation Technology Transfer Service (T3S)	20.205	No. 88P028095A0M560 1780; Proj	-	222,751
Transportation Technology Transfer Service (T3S)	20.205	No. 88P029317A0.M56E	-	254,192
Total Department of Transportation			-	748,552
Total Highway Planning and Construction Cluster			-	748,552
SPECIAL EDUCATION CLUSTER				
Department of Education				
Pass-through programs from:				
South Carolina Department of Education				
Project CREATE: Center for ReEducation and Advancement of Teachers in Special Education	84.027	15CO302-01	-	257

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SPECIAL EDUCATION CLUSTER, Continued				
Department of Education, continued				
Pass-through programs from, continued:				
South Carolina Department of Education, continued				
Project CREATE: Center for ReEducation and Advancement of Teachers in Special Education	84.027	16 Project CREATE-01 H63010100915	-	20,745
Total Department of Education			-	21,002
Total Special Education Cluster			-	21,002
OTHER PROGRAMS				
Department of Agriculture				
2014 Farm Bill- Producer Education- Clemson University Extension Service	10.UNKNOWN	58-0510-4-056 N	-	26,354
CEAH- Disease Spread Modeling Data Deidentification Support	10.UNKNOWN	14-9200-0405-CA	-	20,000
The Planning for Growth and Open Space Conservation Webinar Series	10.UNKNOWN	13-CS-11083150-028	-	(10,773)
USDA Forest Service: Francis Marion and Sumter National Forests Participating Agreement with Clemson University and College of Charleston	10.UNKNOWN	13-PA-11081209-007	9,874	9,874
Animal Disease Traceability	10.025	15-9745-1175-CA	-	95,770
Animal Health Monitoring and Surveillance (Umbrella) Program	10.025	16-9745-1276-CA	-	11,211
Animal Health Surveillance and Response Activities	10.025	15-9745-1276-CA	-	256,277
Animal Health Technical Services (AHTS) Program (Animal Disease Traceability)	10.025	16-9745-1175-CA	-	1,285
Building Screening Capacity for Plant Pathogenic Phytoplasmas for the CAPS Program	10.025	14-8130-0242-CA	-	11,011
Building Screening Capacity for Plant Pathogenic Phytoplasmas for the CAPS Program	10.025	15-8130-0242-CA	-	29,280
Cooperative Agricultural Pest Survey - Pests of National Concern	10.025	15-8245-0380-CA	-	18,619
Cooperative Agricultural Pest Survey - Pests of National Concern	10.025	16-8245-0380-CA	-	9,841
Cooperative Agricultural Pest Survey - Tier 1	10.025	16-8245-0380-CA	-	30,910
Cooperative Agricultural Pest Survey - Tier I	10.025	15-8245-0380-CA	-	42,335
Emerald Ash Borer Survey	10.025	15-8245-0648-CA	-	43,320
Farm Bill - Thousand Cankers/Walnut Twig Beetle Survey	10.025	15-8245-0964-CA	-	17,604
Farm Bill - Forest Pest Outreach	10.025	15-8245-1006-CA	-	35,090
Farm Bill - Honey Bee National Survey	10.025	15-8245-0829-CA	-	10,627
Farm Bill - Junior Invasive Inspectors	10.025	14-8245-0907-CA	-	13,374
Farm Bill - Junior Invasives Inspectors	10.025	15-8245-0907-CA	-	24,855
Farm Bill - Phytophthora Ramorum Program Nursery Survey	10.025	15-8245-0794-CA	-	23,930
Farm Bill - Solanaceous Commodity (Tomato) Survey	10.025	15-8245-1048-CA	-	20,213
Farm Bill - Stone Fruit Commodity Survey	10.025	15-8245-0891-CA	-	23,622
Imported Fire Ant	10.025	15-8245-0178-CA	-	31,034
Imported Fire Ant	10.025	16-8245-0178-CA	-	21,692
National Animal Health Network Laboratory Management Systems Infrastructure	10.025	15-9419-0095-CA	-	58,748
National Animal Health Network Laboratory Management Systems Infrastructure	10.025	16-9419-0095-CA	-	1,862
National Honeybee Survey/Farm Bill	10.025	16-8245-0829-CA	-	1,493
Slow Sand Filtration System for P ramorum Phase 4	10.025	14-8245-0794-CA	-	12,488
Swine Enteric Coronavirus Disease	10.025	14-9745-1304-CA	-	14,492
Witchweed	10.025	15-8245-0028-CA	-	12,825
Witchweed	10.025	16-8245-0028-CA	-	464
Improving Energy Efficiency in South Carolina Animal Facilities and Greenhouses:				
A Partnership for Education Outreach and Technology Adoption	10.054	68-4639-15-0002	2,018	96,788
Bundling of Culinology Nutrition and Packaging in Undergraduate Applied Niche Research	10.217	2012-70003-19969	-	19,386
South Carolina Meat Inspection- Cross Utilization FY2015	10.475	Cross Utilization FY2015	-	207,011
South Carolina Meat Inspection - Cross Utilization FY2016	10.475	Cross Utilization FY2016	-	191,945
South Carolina Meat-Poultry Inspection - (Compliance)	10.475	BASE16 (12-37-A307)	-	93,298
South Carolina Meat-Poultry Inspection - (In Plant)	10.475	BASE16 (12-37-A307)	-	818,613
South Carolina Meat-Poultry Inspection Department - (All Other)	10.475	BASE16 (12-37-A307)	-	147,384
South Carolina Meat-Poultry Inspection Department - (Laboratory)	10.475	BASE16 (12-37-A307)	-	18,102
South Carolina Meat-Poultry Inspection Department - (PHDCIS/FAIM15)	10.475	FAIM15 (12-37-A307)	-	1,006
South Carolina Meat-Poultry Inspection Department - Cross Utilization	10.475	Cross Util 12-37-A-427	-	30
South Carolina Meat-Poultry Inspection Department - (All Other)	10.475	BASE15 (12-37-A307)	-	51,952
South Carolina Meat-Poultry Inspection Department - (Compliance)	10.475	BASE15 (12-37-A307)	-	32,278
South Carolina Meat-Poultry Inspection Department - (In-Plant)	10.475	BASE15 (12-37-A307)	-	263,399
South Carolina Meat-Poultry Inspection Department - (Laboratory)	10.475	BASE15 (12-37-A307)	-	6,269
A Social Ecological Approach to Encourage and Assist Residents to Eat Smart and Move More in Rural Colleton County	10.500	2014-46100-22343	2,651	21,587
Clemson Sustainable Community Project	10.500	2013-41520-21027	12,138	138,299
Cooperative Extension Service - Smith Lever	10.500		-	6,654,190

The accompanying notes are an integral part of this schedule

Clemson University, South Carolina

Schedule of Expenditures of Federal Awards

For the year ending June 30, 2016

Federal Grantor/Pass-through Grantor/Program Title	Federal CFDA Number	Pass-through Entity Identifying Number	Passed Through to Subrecipients	Total Federal Expenditures
OTHER PROGRAMS, Continued				
Department of Agriculture, continued				
Web Based Nutrition Education and Evaluation Reporting System (webNEERS)	10.500	2012-41510-20085	-	168,638
Wood Utilization: Pathway to Healthy Forests and Sustainable Communities	10.500	2015-46401-24241	-	9,656
Farm to School: A Look at Extension's Role Conference	10.575	CN-F2S-EVENT-14-SC-01	-	17,020
Biosecurity Policy and Procedure Evaluation Training and Personal Protective Equipment Demonstrations and Distribution	10.902	68-4639-15-514	-	6,658
Demonstrating Habitat Establishment for Pollinators and Other Beneficial Insects	10.902	68-4639-14-0021	-	3,403
Increase Awareness of Communities' Abilities to Develop Their Own Food Systems and Economics	10.902	69-4639-15-0001	-	12,665
Statewide Demonstration of Improved Irrigation Management to Conserve Water and Enhance Farm Profits Utilizing Real-Time and Site-Specific Weather Information	10.902	69-4639-16-266	-	10,728
Demonstration of Innovative Interseeding Technology for Crop Rotations to Enhance Soil Properties and Reduce Energy Consumption and Pest Occurrence While Optimizing Farm Profits	10.912	69-3A75-12-212	-	185,490
Demonstration of Innovative Water Conservation Technologies to Enhance Resilience to Drought While Optimizing Farm Profits	10.912	69-3A75-13-88	-	132,208
Pass-through programs from:				
South Carolina Forestry Commission				
Forest Pests Detection and Education and Cogongrass Detection Education and Eradication Project	10.UNKNOWN	None	-	85,527
University of Georgia				
Implement Plan of Work for the Southern Region Sustainable Agriculture Research and Education (SARE) Program	10.215	RD309-129/5054766	-	12,959
Implement Plan of Work for the Sustainable Agriculture Research and Education (SARE) Program	10.215	RD309-129/S000836	-	5,299
Southern SARE- Model State Program - Program Assistant	10.215	RD309-129/S000775	-	18,735
University of Georgia				
National Center for Home Food Processing and Preservation	10.303	RE581-468/4893626	-	8,965
University of Florida				
Southern Plant Diagnostic Network	10.304	UFDSP00010248 (formerly UF12230)	-	24,754
University of Florida				
Southern Training Education Extension Outreach and Technical Assistance Center to Enhance Produce Safety	10.328	UFDSP00011131	-	2,193
Purdue University				
Stronger Economies Together: USDA Rural Development Cooperative Agreement RBS-10-39	10.350	8000058198	-	14,994
University of Florida				
Annie's Project Risk Management Training for Farm Women in Florida Alabama South Carolina and Georgia	10.460	UFDSP00010504	-	2,251
Kansas State University				
2015 Department of Defense Child and Youth Reintegration Support Camps	10.500	S15135	-	23,626
Air Force/4-H Military Partnership and Outreach and Support	10.500	S16122	-	2,637
Navy/4-H Military Partnership and Outreach and Support	10.500	S16091	-	8,560
South Carolina 4-H Military Clubs	10.500	S16070	-	2,718
Pennsylvania State University				
AMS Grant Writing Workshop and Technical Assistance	10.500	5403-CU-USDA-2628	-	1,452
South Carolina Department of Social Services				
Child and Adult Care Food Program - Online Training Development and Child Care Provider Training	10.560	4400012896	-	14,082
Total Department of Agriculture			<u>26,681</u>	<u>10,456,482</u>
Department of the Interior				
NWHC Laboratory Informatics Support	15.UNKNOWN	None	-	9,274
The Open Parks Grid Project Part III	15.945	P14AC01735	-	45,653
Pass-through programs from:				
South Carolina Department of Archives and History				
Preserving Pompion Hill Chapel Towards Digital Approaches to Monitoring Historic Structures	15.904	None	-	11,592
Total Department of the Interior			<u>-</u>	<u>66,519</u>
Department of Justice				
Pass-through programs from:				
National 4-H Council				
National Mentoring Program Year 5	16.726	2014-OJJDP-NMPV-541	-	112,235

The accompanying notes are an integral part of this schedule

Clemson University, South Carolina

Schedule of Expenditures of Federal Awards

For the year ending June 30, 2016

Federal Grantor/Pass-through Grantor/Program Title	Federal CFDA Number	Pass-through Entity Identifying Number	Passed Through to Subrecipients	Total Federal Expenditures
OTHER PROGRAMS, Continued				
Department of Justice, continued				
Pass-through programs from:				
National 4-H Council, continued				
South Carolina Mentoring Grant - NMP6	16.726	Grant: 07356	-	80,856
Total Department of Justice			-	193,091
Department of Transportation				
Pass-through programs from:				
South Carolina Department of Transportation				
State Work Zone Safety Training Program	20.UNKNOWN PO #369014/377336		-	(305)
Total Department of Transportation			-	(305)
National Endowment for the Arts				
Arts Engagement in American Communities	45.024	15-5900-7038	-	10,000
Pass-through programs from:				
Humanities Council - South Carolina				
Clemson University Literary Festival	45.024	16-1642-4	-	2,000
South Arts				
2014 - 2015 Southern Circuit Film Festival	45.025	4754	-	400
Total National Endowment for the Arts			-	12,400
National Science Foundation				
Collaborative Research: Computational Intelligence Methods for Dynamic Stochastic Optimization of Smart Grid Operation with High Penetration of Renewable Energy	47.041	ECCS-1232070	-	51,527
EAGER: The LIT ROOM - A Networked Suite of Architectural-Robotic Artifacts Embedded in the Library for Advancing Literacy in Children	47.070	IIS-1352992	-	25,891
Clemson University Middle Grades Noyce Phase II Proposal	47.076	1540623	-	37,785
Tigers Teach Noyce Scholarship	47.076	DUE-1136293	-	296,764
Total National Science Foundation			-	411,967
Small Business Administration				
Pass-through programs from:				
University of South Carolina				
Small Business Development Center - Operating Grant (Federal)	59.037	Federal	-	399,483
Small Business Development Center 2014 Carry Over	59.037	2014 Carry Over	-	23,867
Small Business Development Center 2015 Carry Over	59.037	2015 Carry Over	-	5,952
Total Small Business Administration			-	429,302
Environmental Protection Agency				
2014-2016 Certification and Training Pesticide Programs Cooperative Agreement	66.700	E-98463814	-	163,490
2014-2016 Special Programs Pesticides	66.700	E-98463714	-	163,814
614.2014-2016 Enforcement Pesticide Programs Cooperative Agreement	66.700	E-98463614	-	196,722
Fiscal Year 2015 Pollution Prevention Grant Program	66.708	NP00D41716	-	10,896
Graniteville Mill-Community Development & Improvement Corporation	66.818	None	-	50
Pass-through programs from:				
Commonwealth of Virginia				
Animal Waste Analysis for the Commonwealth of Virginia	66.460	319-2013-P02V	-	37,680
Total Environmental Protection Agency			-	572,652
Department of Education				
Exemplary Personnel for Education Research and Teaching in Special Education (ExPERTISE)	84.325	H325D140044	-	187,533
Pass-through programs from:				
South Carolina Department of Education				
Agriculture Education Professional Development	84.048	Funds Reservation #4000033412 H63010107115	-	46,150
Cherry Grove FFA Camp Caretaker	84.048	16VA302-42	-	21,892
21st Century Community Learning Center After-School Program at Cedar Grove Elementary Palmetto Elementary LaFrance Elementary Pendleton Elementary & Townville Elementary	84.287	H63010006916 21st CCLC-40	-	201,715
21st Century Community Learning Center After-School Program at Chastain and Liberty Elementary School	84.287	H63010006916 16 21st CCLC-50	-	139,002

The accompanying notes are an integral part of this schedule

Clemson University, South Carolina

Schedule of Expenditures of Federal Awards

For the year ending June 30, 2016

Federal Grantor/Pass-through Grantor/Program Title	Federal CFDA Number	Pass-through Entity Identifying Number	Passed Through to Subrecipients	Total Federal Expenditures
OTHER PROGRAMS, Continued				
Department of Education, continued				
Pass-through programs from, continued:				
South Carolina Department of Education, continued				
21st Century Community Learning Center After-School Program at Spearman Elementary School and West Pelzer Elementary School	84.287	H63010006916 21st CCLC-20	-	85,582
21st Century Community Learning Center Bridge Project at Cedar Grove Elementary School Palmetto Elementary School LaFrance Elementary School Pendleton Elementary School and Townville Elementary School	84.287	15CL302-92	-	27,213
21st Century Community Learning Center Bridge Project at Spearman Elementary School and West Pelzer Elementary School	84.287	15CL302-90	-	24,502
21st Century Community Learning Center Summer Bridge Project - Cedar Grove Elementary School Palmetto Elementary School LaFrance Elementary School Pendleton Elementary School & Townville Elementary School	84.287	H63010006915/16 Summer Bridge-92	-	1,337
21st Century Community Learning Center Summer Bridge Project - Chastain Road and Liberty Elementary School	84.287	H63010006915/16 Summer Bridge-91	-	852
21st Century Community Learning Center Summer Bridge Project - Spearman Elementary School and West Pelzer Elementary School	84.287	H63010006915/16 Summer Bridge-90	-	1,337
21st Century Community Learning Centers Grant (Youth Development Center and Youth Challenge Academy)	84.287	11CL302-03	-	(221)
21st Century Community Learning Grant: Cedar Grove Elementary School Palmetto Elementary School LaFrance Elementary School Pendleton Elementary School and Townville Elementary School -GoalPOST (Goal-Oriented Performance in Out of School Time)	84.287	15CL302-40	-	2,077
Learning Mathematics and Science with Technology (LMaST)	84.366	15MS302-01	-	47,024
Learning Mathematics and Science with Technology (LMaST)	84.366	H63010008215 16MSP-01	-	58,415
National Writing Project				
01-SC11-SEED2016; 2016-2017 SEED Advanced Institute to Scale Up the NWP College-Ready Writers Program Grant	84.367	01-SC11-SEED2016 01-SC11-SEED2012 // 2014-2016 SEED Teacher Leadership Development Grant	-	32
2014-2016 SEED Teacher Leadership Development Grant	84.367		-	5,928
South Carolina Commission on Higher Education				
ITQ - Improving Historical Understanding through Structured Inquiry and Multimedia Exchange	84.367	None	-	62,058
National Writing Project				
Investing in Innovation (i3): NWP College-Ready Writers Program - Florence 02	84.411	01-SC11-i32013	-	1,256
Investing in Innovation (i3): NWP College-Ready Writers Program - Greenwood 51	84.411	01-SC11-i32013	-	4,378
Investing in Innovation (i3): NWP College-Ready Writers Program - Union	84.411	01-SC11-i32013	-	4,853
NWP i3 2015-2016 Professional Development Grant /Delayed Start District: Orangeburg 04 School District	84.411	01-SC11-i3DP2015	-	106,916
NWP i3 CRWP 2015-2016 Professional Development Grant/Delayed Start District: Anderson 03 School District	84.411	01-SC11-i3DP2015	-	87,560
NWP i3 CRWP 2015-2016 Professional Development Grant/Delayed Start District: Bamberg 02 School District	84.411	01-SC11-i3DP2015	-	69,225
The Ohio State University				
Improving Literacy Outcomes for Beginning Readers with Disabilities	84.411	60046517	-	90,829
Total Department of Education				1,277,445
Department of Health and Human Services				
Clemson Care: A Campus-Wide Comprehensive Suicide Prevention Strategy	93.243	5U79SM061785-03	-	115,340
Pass-through programs from:				
University of South Carolina				
Faith Activity and Nutrition: Dissemination in Underserved Communities - Year 2	93.135	16-2971	-	9,502
Faith Activity and Nutrition: Dissemination in Underserved Communities (Applied Research Project)	93.135	15-2714 11570 FB18/ PO#91219	-	(1)
Children's Trust of South Carolina				
Comprehensive Wellness Collaborative to Promote Academic Success in Young Parents	93.500	S-OAH-2014-3-1	7,473	8,015
South Carolina Department of Health and Environmental Control				
Improving Access to Healthy Food and Reducing Chronic Disease Through Colleton Mobile Farmers Market	93.758	LC-6-507	-	956
Greenville Health System				
GHS-REACH: A Caregiver Coaching Intervention for High Risk Patient/Caregivers to Extend Dementia Capable Services	93.763	7315-1 /// Grant # G007315	-	8,162

The accompanying notes are an integral part of this schedule

Clemson University, South Carolina

Schedule of Expenditures of Federal Awards

For the year ending June 30, 2016

Federal Grantor/Pass-through Grantor/Program Title	Federal CFDA Number	Pass-through Entity Identifying Number	Passed Through to Subrecipients	Total Federal Expenditures
OTHER PROGRAMS, Continued				
Department of Health and Human Services, continued				
Pass-through programs from, continued:				
South Carolina Department of Health and Environmental Control				
State of South Carolina - Child Care Improvements to the Outdoor Learning Environment	93.991	CY-6-522	-	2,021
Total Department of Health and Human Services			<u>7,473</u>	<u>143,995</u>
Department of Homeland Security				
Pass-through programs from:				
South Carolina Department of Natural Resources				
Boating Safety Forums Project	97.012	SCDNR FY2015-007/P24017400115	-	15,072
South Carolina Emergency Management Division Public Assistance Funding Agreement - 4241 Severe Storms and Flooding (Berkeley Office Bld Contents)	97.029	F#374 UCEAT06	-	7,931
Public Assistance Funding Agreement - 4241 Severe Storms and Flooding (Building Repairs)	97.029	F#358 UCEAT05	-	750
South Carolina Law Enforcement Division 2016 Update of SC Ag-Watch Manual	97.067	15SHSP36	-	16,805
Total Department of Homeland Security			<u>-</u>	<u>40,558</u>
Total Other Programs			<u>34,154</u>	<u>13,604,106</u>
Total Federal Expenditures			<u>\$ 7,747,851</u>	<u>\$ 197,614,589</u>

The accompanying notes are an integral part of this schedule

Clemson University

Clemson, South Carolina

Notes to the Schedule of Expenditures of Federal Awards

June 30, 2016

Note 1. Basis of Presentation

The accompanying schedule of expenditures of federal awards (the schedule) includes the federal award activity of Clemson University (the University) and is presented on the accrual basis of accounting. The information in the schedule is presented in accordance with the requirements of Title 2 U.S. Code of Federal Regulations Part 200, *Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards* (Uniform Guidance). Because the Schedule presents only a selected portion of the operations of Clemson University, it is not intended to and does not present the financial position, changes in net position, or cash flows of the University.

Note 2. Summary of Significant Accounting Policies for Federal Award Expenditures

Expenditures for student financial aid programs include the federal share of students' Federal Supplemental Educational Opportunity Grant (FSEOG) program grants and Federal Work Study (FWS) program earnings, certain other federal financial aid for students and administrative cost allowances, where applicable.

Expenditures for federal research and development programs are determined using the cost accounting principles and procedures set forth in either OMB Circular A-21, *Cost Principles for Educational Institutions* or in Uniform Guidance, as applicable, wherein certain types of expenditures are not allowable or are limited as to reimbursement.

Negative amounts shown on the Schedule represent adjustments or credits made in the normal course of business to amounts reported as expenditures in prior years.

Expenditures for nonfinancial aid awards include indirect costs, related primarily to facilities operation and maintenance and general, divisional and departmental administrative services, which are allocated to direct cost objectives (including federal awards) based on negotiated formulas commonly referred to as facilities and administrative cost rates. Facilities and administrative costs allocated to such awards for the year ended June 30, 2016, were based on predetermined fixed rates negotiated with the University's cognizant federal agency. The University has elected not to use the 10-percent de minimis indirect cost rate as allowed under the Uniform Guidance.

Note 3. Federal Perkins Loan Program (CFDA Number 84.038)

The Federal Perkins Loan Program is administered directly by the University and balances and transactions relating to the program are included in the University's financial statements. Federal expenditures reported on the face of the schedule include loans outstanding at the beginning of the year, loans made during the year, loan cancellations, interest subsidies and administrative expenses. The balance of loans outstanding under the Federal Perkins Loan Program was \$7,372,917 as of June 30, 2016.

Clemson University**Clemson, South Carolina***Notes to the Schedule of Expenditures of Federal Awards**June 30, 2016*

Note 4. Contingencies

The University receives funds under various federal grant programs and such awards are to be expended in accordance with the provisions of the various grants. Compliance with the grants is subject to audit by various government agencies which may impose sanctions in the event of non-compliance. Management believes that they have complied with all aspects of the various grant provisions and the results of adjustments, if any, relating to such audits would not have any material financial impact.

**Independent Auditor's Report on Internal Control Over Financial Reporting
and on Compliance and Other Matters Based on an Audit of
Financial Statements Performed in Accordance with
*Government Auditing Standards***

Members of the Board of Trustees
Clemson University
Clemson, South Carolina

We have audited, in accordance with the auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States, the financial statements of the business-type activities and discretely presented component units of Clemson University (the University), as of and for the year ended June 30, 2016, and the related notes to the financial statements, which collectively comprise the University's basic financial statements, and have issued our report thereon dated October 20, 2016. Our report includes a reference to other auditors who audited the financial statements of Clemson University Research Foundation, the Clemson University Foundation, the Clemson University Land Stewardship Foundation and IPTAY, as described in our report on Clemson University's financial statements. This report does not include the results of other auditors' testing of internal control over financial reporting or compliance and other matters that are reported on separately by those auditors. The financial statements of Clemson University Foundation and IPTAY were not audited in accordance with *Government Auditing Standards*.

Internal Control over Financial Reporting

In planning and performing our audit of the financial statements, we considered the University's internal control over financial reporting (internal control) to determine the audit procedures that are appropriate in the circumstances for the purpose of expressing our opinions on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the University's internal control. Accordingly, we do not express an opinion on the effectiveness of the University's internal control.

A deficiency in internal control exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis. A *material weakness* is a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected on a timely basis. A *significant deficiency* is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.

Compliance and Other Matters

As part of obtaining reasonable assurance about whether the University's financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

Purpose of this Report

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the entity's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the entity's internal control and compliance. Accordingly, this communication is not suitable for any other purpose.

A handwritten signature in black ink that reads "Elliott Davis Decosimo, LLC". The signature is written in a cursive style with a long, sweeping underline.

Greenville, South Carolina
October 20, 2016



**Independent Auditor's Report on Compliance for
Each Major Federal Program; Report on Internal Control Over
Compliance; and Report on the Schedule of Expenditures of
Federal Awards Required by the Uniform Guidance**

Members of the Board of Trustees
Clemson University
Clemson, South Carolina

Report on Compliance for Each Major Federal Program

We have audited Clemson University's (the University) compliance with the types of compliance requirements described in the *OMB Compliance Supplement* that could have a direct and material effect on each of the University's major federal programs for the year ended June 30, 2016. The University's major federal programs are identified in the summary of auditor's results section of the accompanying schedule of findings and questioned costs.

The University's basic financial statements include the operations of the Clemson University Research Foundation (CURF) and Clemson University Land Stewardship Foundation (CULSF), discretely presented component units which received \$2,088,700 and \$1,258,075, respectively, in federal awards which are not included in the University's schedule for the year ended June 30, 2016. Our audit, described below, did not include the operations of CURF and CULSF because the discretely presented component units engaged other auditors to perform an audit in accordance with Uniform Guidance.

Management's Responsibility

Management is responsible for compliance with the requirements of laws, regulations, contracts, and grants applicable to its federal programs.

Auditor's Responsibility

Our responsibility is to express an opinion on compliance for each of the University's major federal programs based on our audit of the types of compliance requirements referred to above. We conducted our audit of compliance in accordance with auditing standards generally accepted in the United States of America; the standards applicable to financial audits contained in Government Auditing Standards, issued by the Comptroller General of the United States; and the audit requirements of Title 2 U.S. Code of Federal Regulations Part 200, Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards (Uniform Guidance). Those standards and the Uniform Guidance require that we plan and perform the audit to obtain reasonable assurance about whether noncompliance with the types of compliance requirements referred to above that could have a direct and material effect on a major federal program occurred. An audit includes examining, on a test basis, evidence about the University's compliance with those requirements and performing such other procedures as we considered necessary in the circumstances.

We believe that our audit provides a reasonable basis for our opinion on compliance for each major federal program. However, our audit does not provide a legal determination of the University's compliance.

Opinion on Each Major Federal Program

In our opinion, the University complied, in all material respects, with the types of compliance requirements referred to above that could have a direct and material effect on each of its major federal programs for the year ended June 30, 2016.

Other Matters

The results of our auditing procedures disclosed instances of noncompliance, which are required to be reported in accordance with the Uniform Guidance and which are described in the accompanying schedule of findings and questioned costs as items 2016-001 and 2016-002. Our opinion on each major federal program is not modified with respect to these matters.

The University's response to the noncompliance findings identified in our audit are described in the accompanying schedule of findings and questioned costs. The University's response was not subjected to the auditing procedures applied in the audit of compliance and, accordingly, we express no opinion on the response.

Report on Internal Control Over Compliance

Management of the University is responsible for establishing and maintaining effective internal control over compliance with the types of compliance requirements referred to above. In planning and performing our audit of compliance, we considered the University's internal control over compliance with the types of requirements that could have a direct and material effect on each major federal program to determine the auditing procedures that are appropriate in the circumstances for the purpose of expressing an opinion on compliance for each major federal program and to test and report on internal control over compliance in accordance with Uniform Guidance, but not for the purpose of expressing an opinion on the effectiveness of internal control over compliance. Accordingly, we do not express an opinion on the effectiveness of the University's internal control over compliance.

A deficiency in internal control over compliance exists when the design or operation of a control over compliance does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, noncompliance with a type of compliance requirement of a federal program on a timely basis. A material weakness in internal control over compliance is a deficiency, or combination of deficiencies, in internal control over compliance, such that there is a reasonable possibility that material noncompliance with a type of compliance requirement of a federal program will not be prevented, or detected and corrected, on a timely basis. A significant deficiency in internal control over compliance is a deficiency, or a combination of deficiencies, in internal control over compliance with a type of compliance requirement of a federal program that is less severe than a material weakness in internal control over compliance, yet important enough to merit attention by those charged with governance.

Our consideration of internal control over compliance was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control over compliance that might be material weaknesses or significant deficiencies and therefore, material weaknesses or significant deficiencies may exist that were not identified. We did not identify any deficiencies in internal control over compliance that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified. However, we identified a deficiency in internal control over compliance, as described in the accompanying schedule of findings and questioned costs as item 2016-001 that we consider to be a significant deficiency.

Report on Internal Control Over Compliance, Continued

The University's response to the internal control over compliance findings identified in our audit are described in the accompanying schedule of findings and questioned costs. The University's response was not subjected to the auditing procedures applied in the audit of compliance and, accordingly, we express no opinion on the response.

The purpose of this report on internal control over compliance is solely to describe the scope of our testing of internal control over compliance and the results of that testing based on the requirements of the Uniform Guidance. Accordingly, this report is not suitable for any other purpose.

Report on Schedule of Expenditures of Federal Awards Required by the Uniform Guidance

We have audited the financial statements of the business-type activities and the aggregate discretely presented components of the University, a component unit of the State of South Carolina, as of and for the year ended June 30, 2016, and the related notes to the financial statements, which collectively comprise the University's basic financial statements. We issued our report thereon dated October 20, 2016, which contained unmodified opinions on those financial statements. We did not audit the financial statements of the Clemson University Research Foundation (a discretely presented component unit), the Clemson University Foundation (a discretely presented component unit), the Clemson University Land Stewardship Foundation (a discretely presented component unit), and IPTAY (a discretely presented component unit). Those statements were audited by other auditors whose reports have been furnished to us, and our opinions, insofar as they relate to the amounts included for these discretely presented components units, are based solely on the reports of the other auditors. Our audit was conducted for the purpose of forming opinions on the financial statements as a whole. The accompanying schedule of expenditures of federal awards is presented for purposes of additional analysis as required by the Uniform Guidance and is not a required part of the basic financial statements. Such information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the basic financial statements. The information has been subjected to the auditing procedures applied in the audit of the financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the basic financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the schedule of expenditure of federal awards is fairly stated in all material respects in relation to the basic financial statements as a whole.



Greenville, South Carolina
October 20, 2016

Clemson University
Clemson, South Carolina
Schedule of Findings and Questioned Costs
For the year ended June 30, 2016

Section I. Summary of Auditor's Results

Financial Statements

Type of report the auditor issued on whether the financial statements were prepared in accordance with GAAP: Unmodified

Internal control over financial reporting:

- Material weakness identified? _____ yes X no
- Significant deficiency identified? _____ yes X none reported

Noncompliance material to financial statements noted? _____ yes X no

Federal Awards

Internal control over major federal programs:

- Material weakness identified? _____ yes X no
- Significant deficiency identified? X yes _____ none reported

Type of auditor's report issued on compliance for major federal programs: Unmodified

Any audit findings disclosed that are required to be reported in accordance with 2 CFR 200.516 (a)? X yes _____ no

Identification of major federal programs:

<u>CFDA Numbers</u>	<u>Name of federal program or cluster</u>
10.RD; 11.RD; 12.RD; 15.RD; 16.RD; 17.RD; 19.RD; 20.RD; 43.RD; 47.RD; 64.RD; 66.RD; 77.RD; 81.RD; 84.RD; 93.RD; 94.RD; 97.RD; 98.RD	Research and Development Cluster
11.300	Economic Development Cluster

Dollar threshold used to distinguish between Type A and Type B Programs \$3,000,000

Auditee qualified as low-risk auditee? X yes _____ no

Section II. Financial Statement Findings

None reported

Section III. Federal Award Questioned Costs & Findings

Finding 2016-001 Incomplete Effort Certifications

Federal Agency: Various

Program: Research and Development Cluster

Criteria or Specific Requirement:

OMB Circular A-21, *Cost Principles for Higher Education Institutions*, establishes principles and standards for determining costs for federal awards carried out through grants, cost reimbursement contracts, and other agreements with higher education institutions. To be allowable under federal awards, costs must meet certain general criteria. Those criteria, among other things, require that expenditures must be allocable, reasonable and supported by adequate documentation. OMB Circular A-21 (section J10) requires that the payroll distribution system allow confirmation of activity allocable to each sponsored agreement and each of the categories of activity needed to identify facilities and administrative costs and the functions to which they are allocable.

Uniform Guidance, section 200.430 establishes specific requirements compensation cost records must meet in order for the costs to be allowable for federal grants subject to Uniform Guidance. Among other requirements, compensation costs must be supported by a system of internal control which provides reasonable assurance that the charges are accurate, allowable and properly allocated. Uniform Guidance also requires that salaries and wages of employees used in meeting cost sharing or matching requirements on Federal awards must be supported in the same manner as salaries and wages claimed for reimbursement from Federal awards.

Condition/Context:

The University uses an online time and effort reporting system, Clemson Link to Employee Activity Reports (CLEAR) to meet the requirements of Circular A-21 and Uniform Guidance, as applicable, regarding the allocation of compensation costs to federal projects. Employees who are paid directly from a sponsored (or related cost share) project are required to certify effort in the CLEAR system. The reports are generated three times each year (fall, spring, and summer) based on the underlying payroll data for that period.

During testing performed over the R&D cluster, we noted that certain CLEAR reports were not generated or not properly generated for employees who switched pay codes during the year (changes between 9M and 12LA) or for employees paid under cost share project numbers beginning with "142XXXX" or "152XXXX".

Clemson University
Clemson, South Carolina
Schedule of Findings and Questioned Costs
For the year ended June 30, 2016

Finding 2016-001, continued

Upon review of the total population of employees affected by the issues referenced above, we noted the following:

Term	Employees who did not receive a CLEAR report	Total employees who should have received a CLEAR report	Percent
Summer 2015	107	1,529	7.0%
Fall 2015	76	1,422	5.3%
Spring 2016	61	1,634	3.7%

As a result, these individuals' compensation costs charged to the projects has not been certified as accurate.

Questioned Costs: Cannot be determined

Effect: Inadequate documentation and lack of required effort certifications may result in the federal funds being expended for unallowable purposes.

Cause: The system is not currently set up to generate reports for 2 different pay codes for the same employee in the same time period. When an employee switches pay codes during the selected time period, the payroll lines related to the original pay code are deleted in the edit process. Employees who switch between these 2 pay codes will then have a time and effort report that does not accurately reflect all time related. While employees are able to submit edits during the certification process, Internal Audit found that some employees had no CLEAR report generated at all for the period.

In Spring 2014, new project numbering conventions were added to meet the need for additional unique project numbers for new awards received by the University. Direct project numbering series 201XXXX and 202XXXX were added along with corresponding cost share project numbering series 142XXXX, 152XXXX, and 162XXXX. The programming codes used to run queries that generate CLEAR reports were never updated to include these new cost share project numbers.

Recommendation: Procedures should be implemented to ensure the queries used to create time and effort reports for employee certification include all required data.

Management Response and Corrective Action Plan:

CLEAR reports for employees who did not receive an effort report or received an incomplete effort report due to the omissions discussed above have been produced and have been presented for certification.

Finding 2016-001, continued

The missing cost share project numbering conventions have been added to the program. The University will no longer generate separate CLEAR reports for the 9MA and 12L pay codes. Instead a single report will be executed for the period that includes all pay code activity. Grants and Contracts Administration staff will review and compare the effort report data with payroll detail data.

Grants and Contracts Administration staff will assume responsibility from the programming staff for reviewing CLEAR report criteria and executing the report process for each reporting period. Report data will be examined for completeness and accuracy before they are made available for certification. Should changes in report criteria become necessary, those changes will be documented with a formal change request to programming staff.

Finding 2016-002 Unallowable Compensation Costs

Federal Agency: National Institutes of Health

Program: Research and Development Cluster
Title: Center of Biomaterials for Tissue Regeneration
CFDA: 93.RD
Award Number: 5P20GM103444-08

Criteria or Specific Requirement: OMB Circular A-21, *Cost Principles for Higher Education Institutions*, establishes principles and standards for determining costs for federal awards carried out through grants, cost reimbursement contracts, and other agreements with higher education institutions. To be allowable under federal awards, costs must meet certain general criteria. Those criteria, among other things, require that expenditures must be allocable, reasonable, supported by adequate documentation and in conformity with any limitations or exclusions set forth in in the sponsored agreement as to types or amounts of cost items.

The National Institutes of Health (NIH) Grants Policy Statement, section 7.9, defines allowable Salaries and Wages as “Compensation for personal services covers all amounts, including fringe benefits, paid currently or accrued by the organization for employee services rendered to the grant-supported project. Compensation costs are allowable to the extent that they are reasonable, conform to the established policy of the organization consistently applied regardless of the source of funds, and reasonably reflect the percentage of time actually devoted to the NIH-funded project.”

Condition/Context: During our testing of payroll amounts charged to National Institutes of Health grants, we noted the Principal Investigator’s (PI) salary and related fringe benefits were overcharged to the grant by \$27,046 for the budget period ended April 30, 2016. The additional salary charged was greater than the budgeted amount for the period and did not accurately reflect the PI’s time devoted to the project.

Clemson University
Clemson, South Carolina
Schedule of Findings and Questioned Costs
For the year ended June 30, 2016

Finding 2016-002, continued

Questioned Costs: \$40,569

Effect: Direct costs of \$27,046 for salary and fringe benefit expenses are questioned as a result of the clerical error. Additionally, facilities and administrative (F&A) expenses were overstated by \$13,523 for the budget period as a result of including the unallowable costs in the F&A cost recovery base.

Cause: Grant coordinators in each department are responsible for reviewing salaries charged to each grant and ensuring charges are in agreement with the budgeted amounts approved by the sponsoring agency. When the grant coordinator reviewed charges to the grant for the budget period ending April 30, 2016 to determine whether salary had been properly charged, the coordinator inadvertently used a query that only included the salary charged during the time period of July 1, 2015 through April 30, 2016 rather than including the full budget period of May 1, 2015 through April 30, 2016. Because the query did not include the first two months of the budget period, it appeared the PI's salary had been undercharged to the grant in comparison to the budgeted amounts for the period. As a result, payroll corrections were made to charge an additional \$27,046 of the PI's salary and fringe benefits to the grant.

Recommendation: Procedures should be implemented to ensure queries used in the review process are complete and accurate.

Management
Response and
Corrective

Action Plan: A payroll correction journal is being processed to reverse the amount of the original corrections. The affected employee's fall effort report will reflect this correction, giving the employee the opportunity to recertify the Spring 2016 effort.

Grants and Contracts Administration will implement procedures to provide more detailed monitoring of salaries and payroll corrections on all sponsored projects. In addition, Grants and Contracts Administration will assess the need for training and updating policies.

Clemson University
Clemson, South Carolina
Summary Schedule of Prior Audit Findings
For the year ended June 30, 2016

In accordance with *Government Auditing Standards*, issued by the Comptroller General of the United States, the following is the status of known material findings and recommendations from prior year audits:

None reported