

Federal Agency and Organization Element to Which Report is Submitted: **4900**

Federal Grant or Other Identifying Number Assigned by Agency: **1601552**

Project Title: **Opening Pathways to Employment through Nontraditional Geospatial Applications in Technical Education (OPEN-GATE)**

PD/PI Name: **Jackson D Cothren, Principal Investigator
Tamara Griffin, Co-Principal Investigator
Debby King, Co-Principal Investigator
Robyn J Lane, Co-Principal Investigator
W. Frederick Limp, Co-Principal Investigator**

Recipient Organization: **University of Arkansas**

Project/Grant Period: **07/15/2016 - 06/30/2019**

Reporting Period: **07/15/2016 - 06/30/2017**

Submitting Official (if other than PD\PI): **Robyn J Lane
Co-Principal Investigator**

Submission Date: **07/05/2017**

Signature of Submitting Official (signature shall be submitted in accordance with agency specific instructions) **Robyn J Lane**

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Accomplishments

* What are the major goals of the project?

The two major goals of this project are 1) expanding access to education and training in geospatial technologies and 2) increasing adoption of geospatial technologies statewide to support economic development and the growth of a spatially-enabled workforce. Surveys of businesses across Arkansas indicated a need for a workforce with spatial skillsets rather than geospatial specialists, particularly in rural areas (which is most of Arkansas). This project is designed to address a void in geospatial education and training in Arkansas by building capacity in educators across an educational continuum (K-12 through undergraduate, with a special focus on two-year colleges). Such capacity-building allows educators to integrate geospatial technologies into existing curricula to reinforce content as students develop relevant spatial skillsets that are directly applicable to their studies and marketable to future employers. Our proposal listed specific objectives necessary to accomplish our goals and provided a general timeline for key events that supported these objectives, based on the semester of anticipated completion. Project Goals are listed below with objectives and supporting activities for Year One:

Goal 1: Increase adoption of geospatial technologies in industry and government

Foster partnerships and close collaboration between industry, educators, and students at all levels to define regionally-specific skillsets, assess performance of new hires, and use this input to fine-tune educational offerings

Create Employer Advisory Boards (EABs) at each two-year institution, composed of representatives of targeted industry (based on pilot degree program for geospatially-augmented instruction) and local business leaders (to raise visibility of geospatial applications locally) (*anticipated completion: Fall 2016; status: 2 of 4 created in Year 1*)

Host one (1) Employer-Student outreach event at each partner institution annually, such as a GIS Day, to bring together local employers, GIS professionals, two-year college students, and local secondary school teachers and students (*anticipated completion: Spring 2017; status: 2 of 4 completed for Year 1*)

Goal 2: Expand access to education and training in geospatial technologies at two-year institutions and secondary schools, articulating multiple points of entry and pathways to education and employment

Articulate strategies for the development and expansion of geospatially-augmented curricula in existing degree programs at two-year institutions and develop a system-wide structure for continuing education and certification in applied geospatial technologies.

Conduct one (1) in-person planning meeting in the first year, with teleconference follow-up, for administrators, educators, OPENGATE staff, and external advisor (*anticipated completion: Fall 2016; status: completed January 19-20, 2017*)

Build capacity in geospatial technology education at two-year institutions

Acquire licenses and accounts for geospatial software and applications for partner institutions (*anticipated completion: Fall 2016; status: 70% complete*)

Strategy and professional development workshops each year at partner institutions for campus champions and other interested faculty (*anticipated completion: Fall 2016-Spring 2017; status: 3 of 4 visits completed in Year 1*)

Foster adoption of geospatial technologies at the secondary school level in support of STEM learning and the availability of local educational pathways at regional two-year colleges

Coordinate with the Arkansas Department of Education to build professional development workshops for secondary school educators (*anticipated completion: Spring 2017; status: completed March 2017*)

Coordinate with the Arkansas Department of Career Education (ACE) to update existing curriculum content frameworks for geospatial technologies and increase utilization of curriculum through digital learning (*anticipated completion: Spring-Summer 2017; status: 20% complete*)

Provide ongoing support and resource development for two-year and secondary school institutions and employers

Launch and maintain project website (*anticipated completion: Spring 2017; status: website launched April 2017; content generation is ongoing*)

Ongoing development of instructional materials and resources for insertion into existing courses in established degree programs by campus champions and OPENGATE staff. (*begun Spring 2017 and currently ongoing*)

Year One of this project has focused primarily on expanding access to education and training in geospatial technologies (Goal 2). In this phase, our objectives supported capacity-building and curriculum development at the secondary school and two-year college levels; coordination, collaboration, and information sharing among the partners; and initial outreach to communities of interest.

*** What was accomplished under these goals (you must provide information for at least one of the 4 categories below)?**

Major Activities:

Geospatial technologies are often underutilized in rural areas of Arkansas, and where they are utilized in industry, they are often "hidden" in that the first exposure workers receive occurs on the job. In particular, there is a dearth of access to geospatial technologies in educational settings. In our first year, our primary focus has been on filling that void by assessing regional needs, strategic planning and collaboration, building capacity in community college faculty, and initial outreach to local communities.

Planning Meetings

Our initial plan was to conduct a two-day planning meeting during Fall 2016 and follow those up with scheduled video conferences. However, we were unable to find a suitable date in the fall where all partners could be present for the full two days. Instead, we held an initial orientation meeting that was approximately 2 hours in length via videoconference on August 18, 2016, and followed this videoconference with our two-day, in-person planning meeting on January 19-20, 2017. On our August 18 videoconference, representatives from UA-Batesville, UA-Cossatot, UA-Morrilton, UA-Phillips, and the Center for Advanced Spatial Technologies (CAST) were present, as well as our evaluator, Gordon Snyder, and external adviser, Tora Johnson. During this brief meeting (agenda attached), we discussed the overall goals of the project with a focus on key activities for the fall, as well as platforms for collaboration and communication. In addition, we scheduled our two-day in-person planning meeting and began scheduling our strategy and professional development workshops on the community college campuses.

Our two-day, in-person planning meeting was held on January 19-20, 2017, attended by 12 representatives from partner institutions, Tora Johnson, and Gordon Snyder via video conference (agenda attached). Key issues addressed during this meeting were drafting of institutional plans and mechanisms for outreach and documentation/dissemination of project activities and findings. Critical challenges that emerged from the discussion are 1) the paradox of rural social and economic realities that create "brain drain" while preventing other students from leaving to pursue their educational goals; and 2) effective strategies to translate a broadened awareness of geospatial technologies into actual jobs. At the end of the second day, timeframes were set for student outreach activities, the annual partnership conference, and professional development workshops for secondary school faculty.

Strategy and Professional Development Workshops at Community Colleges

Two-day strategy and PD workshops on each community college campus were used to introduce community college faculty to geospatial technologies and provide OPENGATE staff an opportunity to observe classes and with faculty, identify challenges, limitations, and opportunities unique to each school. Robyn Lane of CAST visited UA-Batesville and UA-Cossatot in Fall 2016 and UA-Morrilton in Spring 2017. During these visits, all involved faculty were given temporary accounts in UA-Fayetteville's ArcGIS Online organizational account and were given basic training in ArcGIS Online to illustrate its capabilities and stimulate ideas about

classroom integration. Access was also provided to ArcGIS Pro and ESRI software tutorials.

Outreach

Two student outreach events were held in Spring 2017 at UA-Batesville and UA-Cossatot. At UA-Batesville, EAST programs at local schools were invited to come to campus to present projects they've done in EAST programs (including geospatial projects). Professionals from local industries were in attendance to interact with students and discuss how technology is used in industry. UA-Batesville has hosted similar events in the past, and this one was expanded to include information about OPENGATE and geospatial technologies on campus. Nine teachers and 90 students from 8 local schools were in attendance, as well as three representatives of local industry and the Chamber of Commerce. At UA-Cossatot, a GIS day was held on campus in April to announce its participation in OPENGATE and demonstrate how geospatial technologies were used in agriculture (press release attached). In attendance were two UA-Cossatot agriculture faculty, the UA-Cossatot marketing director, 5 community college students, 5 teachers from local schools and the educational cooperative, and two industry representatives. (Local secondary school students were unable to attend due to scheduled standardized testing.)

UA-Cossatot and UA-Batesville have formed their Employer Advisory Boards (EABs) to liaison with local industry and potential employers. UA-Cossatot has a 4-member board composed of representatives from forestry, livestock producers, the poultry industry, and sustainable farming. UA-Batesville's board is currently composed of two members, one of whom represents the financial planning industry with expertise in entrepreneurship and data analysis, and the other manages geospatial information systems for the local electric cooperative.

Professional Development for Secondary School Teachers

Assurance provider certification for professional development was obtained from the Arkansas Department of Education by OPENGATE staff in March 2017. Curriculum for professional development workshops have been developed and initial resources have been created. Four workshops were planned for Summer 2017 at each community college, but 5 have been scheduled to take place in June, July, and August at each community college as well as the UA-Fayetteville campus (by request).

Project Website Design and Development

Design and development of the project website was done by CAST staff during the fall and spring of Year One and is structurally complete, but many sections are still lack content. The website was launched May 2017, and population of the site is ongoing as content is created.

Specific Objectives:

Significant Results:

Key outcomes or Other achievements:

* What opportunities for training and professional development has the project provided?

Because the goal of this project is the integration of geospatial technologies is into existing curriculum and degree programs at colleges where no geospatial programs exist, most participating faculty and staff at have little to no experience with geospatial technologies. Introductory training and professional development has therefore been a general introduction to geospatial concepts, data, and real-world applications, with basic hands-on instruction using ArcGIS Online, the most intuitive and user-friendly application with which to begin. This instruction takes place as part of the two-day strategy and professional development workshops, which gives faculty a chance to explore its capabilities and identify opportunities to insert it into existing curriculum and courses. Three of four planned workshops have been held (UA-Batesville, UA-Cossatot, and UA-Morrilton), with a total of seven faculty and staff participating. At each community college, these training sessions have allowed faculty to identify specific courses to augment with geospatial instruction and begin to develop lessons that incorporate geospatial technologies.

* How have the results been disseminated to communities of interest?

Nothing to report.

* What do you plan to do during the next reporting period to accomplish the goals?

In the next reporting period, activities will build on the foundation laid in year one as we continue professional development for community college faculty and secondary school teachers, industry engagement, and resource development. However, in year two of the project our focus will expand to include curriculum implementation and progress assessment.

During the next year, we will enroll the first students in geospatially-augmented curricula at community colleges and will be conducting pre- and post-course evaluations as well as ongoing monitoring of student involvement and performance. At the secondary school level, teachers who participated in our professional development series will be implementing the lessons developed during the seminar and providing feedback about student engagement and content reinforcement. Our

evaluator will conduct a site visit in Spring 2018 for assessment purposes. Feedback from these assessments will be used to refine and revise methods and materials used during the initial implementation.

In addition, we will expand our efforts at industry engagement by hosting a partnership conference in September 2017 and through presentations at conferences and seminars, including the Arkansas GIS Users' Symposium in October 2017. Recruitment of industry professionals to deliver guest lectures or demonstrations at community colleges will begin in Fall 2017.

Further coordination with education agencies such as the Arkansas Department of Career Education and regional educational cooperatives will provide opportunities for recruiting additional teachers to professional development workshops and integration of geospatial technologies into secondary schools.

During year two, OPENGATE staff will also begin to draft papers on project results and findings for submission to appropriate venues.

Supporting Files				
	Filename	Description	Uploaded By	Uploaded On
(Download)	08_18_2016_CollaboratorsMeeting.pdf	Agenda and Attendees for Initial Planning Meeting	Robyn Lane	06/30/2017
(Download)	01_19-20_2017 Planning Meeting Agenda.pdf	Agenda for Partners' Planning Meeting	Robyn Lane	06/30/2017
(Download)	GISDay4.24.17.pdf	UACC-Cossatot Press Release for Student Outreach Event	Robyn Lane	06/30/2017
(Download)	UACCB_Student Outreach.pdf	UACCB Invitation and Agenda for Student Outreach Event	Robyn Lane	06/30/2017

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Products

Books

Book Chapters

Inventions

Journals or Juried Conference Papers

Licenses

Other Conference Presentations / Papers

Other Products

Other Publications

Patents

Technologies or Techniques

Thesis/Dissertations

Websites

OPENGATE: Opening Pathways to Employment through Nontraditional Geospatial Applications in Technical Education
<https://opengate.cast.uark.edu/>

Project website will host and disseminate all resources created during the duration of the project. What is currently live is a home page with a description the project, links to partner institution websites, and a listserv subscription feature. The events page is also live and features information and online registration for our upcoming summer professional development series for secondary school faculty. The content management system for hosting resources has been fully developed with sections dedicated to education, industry, research, and outreach. As content is developed over the project duration, it will be added to the website. We anticipate that it will feature contextualized curricula and course materials from two-year institutions, lesson plans from secondary school professional development workshops, presentations and publications, employer resources, evaluations and project reports, and links to existing support resources and agencies.

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Participants/Organizations

What individuals have worked on the project?

Name	Most Senior Project Role	Nearest Person Month Worked
Cothren, Jackson	PD/PI	1
Griffin, Tamara	Co PD/PI	1
King, Debby	Co PD/PI	1
Lane, Robyn	Co PD/PI	6
Limp, W. Frederick	Co PD/PI	0
Williamson, Malcolm	Co-Investigator	2
Harris, Kelli	Community College Faculty	2
Strassle, Dana	Community College Faculty	1
Ford, Hanna	Technician	2
Johnson, Tora	Consultant	1
Snyder, Gordon	Consultant	2

Full details of individuals who have worked on the project:

<p>Jackson D Cothren Email: jcothre@uark.edu Most Senior Project Role: PD/PI Nearest Person Month Worked: 1</p> <p>Contribution to the Project: Supervisory role</p> <p>Funding Support: All time funded in his role as Director of the Center for Advanced Spatial Technologies</p> <p>International Collaboration: No International Travel: No</p>
<p>Tamara Griffin Email: tamara.griffin@uacccb.edu</p>

Most Senior Project Role: Co PD/PI

Nearest Person Month Worked: 1

Contribution to the Project: Campus Champion and senior personnel at University of Arkansas-Batesville; head of Business and Information Technology Department; coordination of institutional efforts

Funding Support: Time funded through her role as UACCB department head

International Collaboration: No

International Travel: No

Debby King

Email: dking@pccua.edu

Most Senior Project Role: Co PD/PI

Nearest Person Month Worked: 1

Contribution to the Project: Vice Chancellor for Instruction at University of Arkansas-Phillips; coordination of institutional efforts

Funding Support: Time funded through her role as administrator at UACC-Phillips

International Collaboration: No

International Travel: No

Robyn J Lane

Email: robyn@cast.uark.edu

Most Senior Project Role: Co PD/PI

Nearest Person Month Worked: 6

Contribution to the Project: Project director

Funding Support: No other funding support

International Collaboration: No

International Travel: No

W. Frederick Limp

Email: fred@cast.uark.edu

Most Senior Project Role: Co PD/PI

Nearest Person Month Worked: 0

Contribution to the Project: Advisory

Funding Support: No other funding support

International Collaboration: No

International Travel: No

Malcolm D Williamson

Email: malcolm@cast.uark.edu

Most Senior Project Role: Co-Investigator

Nearest Person Month Worked: 2

Contribution to the Project: Provides professional development and assists with development of instructional materials and resources

Funding Support: No other funding support

International Collaboration: No

International Travel: No

Kelli S Harris

Email: kharris@cccua.edu

Most Senior Project Role: Community College Faculty

Nearest Person Month Worked: 2

Contribution to the Project: Campus Champion and senior personnel at University of Arkansas-Cossatot; instructor in Agriculture and coordinator of institutional efforts

Funding Support: No other funding support

International Collaboration: No

International Travel: No

Dana Strassle

Email: Strassle@uaccm.edu

Most Senior Project Role: Community College Faculty

Nearest Person Month Worked: 1

Contribution to the Project: Campus champion and Instructor of Biological and Geological Sciences at University of Arkansas-Morrilton; coordination of institutional efforts

Funding Support: No other funding support

International Collaboration: No

International Travel: No

Hanna Ford

Email: hanna@cast.uark.edu

Most Senior Project Role: Technician

Nearest Person Month Worked: 2

Contribution to the Project: Website design and development; organization and event planning

Funding Support: No other funding support

International Collaboration: No

International Travel: No

Tora Johnson

Email: tjohnson@maine.edu

Most Senior Project Role: Consultant

Nearest Person Month Worked: 1

Contribution to the Project: As PI on ATE 0802417, Tora developed expertise in collaborative geospatial education projects geared toward rural populations. She serves as an external adviser on the project.

Funding Support: No other funding support

International Collaboration: No

International Travel: No

Gordon Snyder

Email: gordonfsnyder@gmail.com

Most Senior Project Role: Consultant

Nearest Person Month Worked: 2

Contribution to the Project: External evaluator

Funding Support: No other funding support

International Collaboration: No

International Travel: No

What other organizations have been involved as partners?

Name	Type of Partner Organization	Location
EAST Initiative	Other Nonprofits	Little Rock, Arkansas

Full details of organizations that have been involved as partners:

EAST Initiative

Organization Type: Other Nonprofits

Organization Location: Little Rock, Arkansas

Partner's Contribution to the Project:

Other: Public relations and dissemination

More Detail on Partner and Contribution: The EAST Initiative is a K-12 educational non-profit organization that works to get project-based service learning in schools, with programs in 221 schools in Arkansas. Since 1997, this organization has provided access to geospatial technologies to EAST programs while offering training and technological support to students and teachers through collaboration with the UA Center for Advanced Spatial Technologies. EAST has been a partner in promoting OPENGATE by disseminating information about the project to participating schools and actively recruiting teachers to participate in professional development through OPENGATE.

What other collaborators or contacts have been involved?

UACC-Batesville faculty and staff

Zach Harber, Director of Workforce Development and Education

Matt Critcher, Instructor in Business and Information Technology

Jo Stephens, Director of Educational Technology

Crystal Blue, Computer Lab Manager

UACC-Cossatot faculty and staff

Ashley Aylett, Vice Chancellor of Academics

Barbara Lacefield, Division Chair, Agriculture

UACC-Morrilton faculty and staff

Linda Jaramillo, Director of Academic Initiatives

UACC-Phillips faculty and staff

Shaun Anderson, Title III STEM Activity Director

Robin Bryant, Department Chair, Arts and Sciences

Employer Advisory Board, UACC-Batesville

Randy Everett, Geographic Information Systems Manager, First Electric Cooperative Corp.

Allen Engstrom, Owner and CEO, CFO Financial Network

Employer Advisory Board, UACC-Cossatot

Harrell Sherwood, Arkansas Forestry Commission

Rex Herring, Sevier County Extension Office

Phillip Owens, PhD, Research Leader, USDA Dale Bumpers Small Farms Research Center

Coty Johnson, Pilgrim's Pride

Presenters at UACC-Cossatot GIS Day

Garrett Jones, Pettit Machinery

Kevin Pruett, Total Assessments

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Impacts

What is the impact on the development of the principal discipline(s) of the project?

Nothing to report.

What is the impact on other disciplines?

Nothing to report.

What is the impact on the development of human resources?

Nothing to report.

What is the impact on physical resources that form infrastructure?

Nothing to report.

What is the impact on institutional resources that form infrastructure?

Nothing to report.

What is the impact on information resources that form infrastructure?

Nothing to report.

What is the impact on technology transfer?

Nothing to report.

What is the impact on society beyond science and technology?

Nothing to report.

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Changes/Problems

Changes in approach and reason for change

Nothing to report.

Actual or Anticipated problems or delays and actions or plans to resolve them

In the first year of the project, our biggest challenges have been the delayed start of the project due to a later-than-expected notification of award, the relative inexperience with federal grants at two of the community colleges, and staff turnover at one community college.

Our notification of award was received on July 13, 2016 with a start date of July 15. At that point, our first priority was scheduling the planning meeting, but we were unable to find a date that worked until January. During the grant proposal period, coordination was largely with community college administrators rather than the faculty who would be implementing geospatially-augmented curricula, so that early planning meeting was intended to fully communicate the goals and objectives of the grant to the people who would be most directly involved. At the two community colleges where faculty was involved early in the proposal process (UA-Batesville and UA-Cossatot), is where we have seen the greatest momentum in the project. At UA-Morrilton, the campus champion was selected very near the end of the grant proposal writing, and through either miscommunication or misinformation, understood that her efforts would be in addition to her regular summer teaching duties rather than being relieved of them to work on the project. At UA-Phillips, staff turnover has caused delays in the selection of a campus champion, which has in turn delayed other critical activities necessary to implement the project on the college campus. While these events have caused delays in the projects, we do not expect them to continue to delay the project in year two, as we have been working closely with UA-Morrilton and UA-Phillips to address these issues during year one.

Changes that have a significant impact on expenditures

Nothing to report.

Significant changes in use or care of human subjects

Nothing to report.

Significant changes in use or care of vertebrate animals

Nothing to report.

Significant changes in use or care of biohazards

Nothing to report.

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Special Requirements

Responses to any special reporting requirements specified in the award terms and conditions, as well as any award specific reporting requirements.