Cover

Federal Agency and Organization Element to Which Report is Submitted:

4900

Federal Award or Other Identifying Number Assigned by Agency:

1955256

Project Title:

Meeting Workforce Needs for Skilled Geospatial Technicians through Virtual Geospatial Information Science Technology Education

PD/PI Name:

- **Jonathan Little, Principal Investigator**
- **Catherine M DuBreck, Co-Principal Investigator**
- **Heather Pierce, Co-Principal Investigator**

Recipient Organization:

Monroe Community College

Project/Grant Period:

06/01/2020 - 05/31/2025

Reporting Period:

06/01/2023 - 05/31/2024

Submitting Official (if other than PD\PI):

N/A

Submission Date:

N/A

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

N/A

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Accomplishments

* What are the major goals of the project?

Meeting Workforce Needs for Skilled Geospatial Technicians through Virtual Geospatial Information Science Technology will support the growing GIST industry across Upstate New York with the development of: (1) a 60-credit online Associate in Applied Science (A.A.S.) degree, and (2) a GIST micro-credential that is designed to upskill incumbent GIST technicians. The project goal is to meet the region's rapidly growing demand for geospatial technicians with advanced skills through program development and improvement by expanding the existing certificate program into an online A.A.S. GIST degree and developing a 9-credit micro-credential designed for on-the-job educational needs across Upstate New York. The development of the A.A.S. degree in GIST will require curriculum and educational materials development, which includes creation of three new courses and updating of all existing courses to meet current GIST education guidelines. In addition, six courses will be converted to an online format.

Meeting Workforce Needs with Virtual GIST will offer students unique online mentoring support by faculty and four alumni who are in the GIST workforce. It will also develop virtual GIST internships providing students with the skills needed to work remotely. Outreach to rural libraries, high schools, digital marketing campaign, and presentations at various Upstate New York GIST conferences will spread awareness and increase enrollment.

The six key objectives for this project are:

Objective 1: Build A.A.S. Degree in GIST by adding new courses and updating existing courses

Objective 2: Augment A.A.S. Degree in GIST with online course development

Objective 3: Provide "Open" GIST lab with Virtual Student Mentors and Alumni GIST Mentors

Objective 4: Provide virtual GIST internships

Objective 5: Deliver innovative outreach and enriched virtual support from Public Librarians

Objective 6: Recruitment of Introductory GIST students and GIST Professionals

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

Major Activities:

> The Meeting Workforce Needs through Virtual GIST PI's offered and taught the three new courses for a third year. Students continue to graduate with their A.A.S. in GIST as well as the GIST Microcredential. The PIs taught the three courses that comprise the microcredential: 1) Geospatial Data Acquisition and Management (fall of 2024), Web Mapping (spring of 2024), and Introduction to Geospatial Programming (spring of 2024). Course materials were modified slightly based on feedback from students in 2022-2023 and guidance of the GIST Advisory board to align with local workforce needs. A third cohort of students are expected to receive the GIST microcredential end of spring semester 2024, as well as the A.A.S. in GIST.

Due to demand from the New York State Division of Criminal Justice Services, a new course called GIS Crime Dashboards was developed by the PI's during the summer and fall of 2023, and taught spring of 2024.

The PI's have updated or revised labs in our original GIST courses. For example, in Introduction to GIS, all labs were modified to the latest software (ArcGIS Pro 3.12 as of FL24). In Introduction to Remote Sensing, students now use a workforce tool called AI to classify land cover. With changes in technology, the GIST program has updated the ArcGIS Pro and QGIS software, requiring minor changes in all of our GIST courses.

The PI's taught the three original new GIST courses in an online environment for the third time, as well as the new GIS Crime Dashboards course.

The Virtual GIST team (three alumni) have provided a fourth cohort of GIST students with online (and in person) mentoring. Two of the three alumni have been mentoring all four years. A new alumni mentor recently graduated from MCC, and was a part of the NSF ATE START Maine supplemental grant. Due to the no-cost extension, the number of mentors decreased to three. For a fourth year in a row, some alumni mentors provided an Ask Me Anything session, with an audio recording available. Ask Me Anything sessions allow students to ask alumni any GIST and career related questions. In addition, one student tutor provided online support (and in person) during this same time period.

The Virtual GIST program offered 8 virtual internships to Capstone students to 8 students. Capstone students were given pre and post surveys, and were matched with hosts depending on the skills and interests. Virtual internships hosts included Jade University of Applied Sciences, Oldenburg (Germany), two with the New York State Department of Health, FLOW - Traverse City, and a new internal internship to support the college's institutional research, as well as others. Students presented their work on May 16, 2024. During the spring of 2024, another paid internship supported the Holocaust, Genocide, and Human Rights Project (HGHRP) based in Rochester, NY.

An additional GIST A.A.S. graduate participated in the third paid GIST internship summer of 2023. Hosts included the University of Maine's Center for Advanced Forestry Systems and were a part of the Skills Training in Advanced Research & Technology (START) Supplemental Funding Request for ATE at Monroe Community College (Award #1955256) with IUCRC Phase 3 at University of Maine - CAFS. The paid internship finalized the research from the summer of 2022, and integrated machine learning to develop a QGIS plug in to remove clouds and shadows from satellite imagery. The PI's and a student presented their work in September of 2023 at the NY State GIS conference titled: "Virtual Internships: GEG 239 Capstone Projects".

Three current GIST students will be provided with a paid summer (2024) GIST internship with the University of Maine CAFS. Out of 8 A.A.S. students that are expected to graduate, three students have a planned paid internship summer of 2024 (e.g., Town of Greece).

The PIs completed their work with Public and College Librarians in the spring of 2023. The relationship with librarian have blossomed into a number of events, including participation in a workshop focused on Using GIS to support Diversity, Equity, and Inclusion (2023), as well as highlighting student GIST work at MCC's Scholars' Day (2024) and MCC's Celebration of Learning (2024).

In the past year, the team recruited students through the GIST web page, social media campaign (e.g., Facebook targeted ads, email listserv), articles, and conferences. This past year, we are attempting a new Facebook targeted ad in late May. This approach has been proven quite effective in other programs at the College, and we hope that we will reach many across New York State. Results will be determined June of 2024. PIs make updates to the GIST web page to note GIST activities/courses.

PIs presented informally or formally at numerous conferences, including the GeoEd (June of 2023), NY GIS conference (2023), as well as two mapping events. In addition, the PI's presented at a high school career fair and STEM club.

The GIST Advisory Board received an email update on the project spring of 2024.   The Advisory Board will provide suggestions on course improvements for our introductory GIS courses, Web Mapping, and Introduction to Geospatial Programming as well as the our Capstone project. The group is made of community college faculty (not MCC), four-year university faculty, regional GIS employees, and the Director of the National GeoTech Center.

Unexpected Positive Results:

MCC's mapping club and the PIs hosted Dr. Joseph Kerski, a leading GIS advocate from Esri November 2023. He presented on "Modern GIS Tools to Explore Diversity, Equity, and Inclusion". Four librarians attended.

The program was awarded an International Training and Education in Advanced Technologies (ATE-I) supplement for $31,527 summer of 2023. This allowed for collaboration with two universities in Germany, as well as attendance at the AGILE (Association of Geographic Information Laboratories in Europe) conference in Netherlands. The PI and a colleague visited German faculty hosts: Professor Carsten Kessler at Bochum University of Applied Sciences and Professor Andreas Gollenstede and Professor Roland Thomas at Jade University of Applied Sciences in Oldenburg. Through the collaboration, faculty observed GIS educational methods, curricula, and how the hosts integrate with industry. Faculty developed a new module focused on web mapping and streamlining open-source programming. A student received a virtual internship spring of 2024 with Jade University of Applied Sciences. The student used ArcGIS model builder and Python scripting to assess the connectivity of 2000 Natura sites in Germany.

Due to the Skills Training in Advanced Research & Technology (START) with MCC & the University of Maine-CAFS project, an additional students received a paid internship summer of 2023.

Funded externally from MCC, at least three recent GIST graduates will receive a paid internship/entry level job with the Town of Greece, City of Rochester, and Niagara County.

A recent alumni and NSF ATE START recipient, received a paid internship with NASA.

In 2024, the program was awarded a new Skills Training in Advanced Research & Technology (START) with MCC & the University of Maine -CAFS project for $93,366. Three students are expected to receive a paid internship summer of 2024.

A 2021 MCC Librarian cohort member took an introductory GIS course in 2023, and is planning to complete the GIST Certificate by spring of 2025.

A GIST student won the 2024 GIS SIG mapping competition.

A GIST student received an award for their remote sensing project at MCC's Scholars' Day.

Two MCC Librarians that participated in the 2021 cohort have supported and added murals/maps on the walls in a small MCC computer lab called the GIST hub. One alumni mentor and one peer tutor use this space when offering support both virtually and in person.

PI taught a new Crime Dashboards course thanks to the partnership with the New York State Division of Criminal Justice Services.

Highlighted in Esri's fall 2023 ebook: How Monroe Community College Built a Microcredential.

Specific Objectives:

Objective 1: Build A.A.S. Degree in GIST by adding new courses and updating existing courses

The A.A.S. in GIST and microcredential has seen the third cohort of students graduate with the new degree.

Objective 2: Augment A.A.S. Degree in GIST with online course development

Five GIST courses continue to be modified as technology changes, and taught in an online environment. Due to government needs, a sixth course was developed, taught online, and is now being modified and is expected to be offered fall of 2024.

Objective 3: Provide "Open" GIST lab with Virtual Student Mentors and Alumni GIST Mentors

Student and alumni mentors provided online support throughout the fall 2023 and spring 2024 semester.

Objective 4: Provide virtual GIST internships

Capstone in Geospatial Technology students were provided a virtual internship.

Objective 5: Deliver innovative outreach and enriched virtual support from Public Librarians

All objectives completed year 1-3. In this year, invited a guest speaker for a two-hour workshop on Using Modern GIS Tools to Explore Diversity, Equity, and Inclusion. Four librarians attended.

Objective 6: Recruitment of Introductory GIST students and GIST Professionals

PIs led a significant social media campaign and the program at conferences, radio, and a published article.

Significant Results:

Objective 1: Build A.A.S. Degree in GIST by adding new courses and updating existing courses

- The A.A.S. in GIST and microcredential are now being offered to a third cohort of students. The three microcredential courses are now being offered for a third year: 1) Geospatial Data Acquisition and Management by senior personnel Howard, 2) Web Mapping by PI Little, and 3) Introduction to Geospatial Programming by SP Howard. Time was used in the slight modification of these three courses based on feedback from the previous year and the GIST advisory board.

Objective 2: Augment A.A.S. Degree in GIST with online course development

- For the third year, Introduction to GIS, Introduction to Remote Sensing, Cartography, Spatial Analysis and GIS, and Capstone in Geospatial Technology were taught in an online environment. To highlight, all GIST labs in our introductory course were modified to align to the latest Fall 2024 software. In Introduction to Remote Sensing, a lab was modified to use the latest in Artificial Intelligence.

Objective 3: Provide "Open" GIST lab with Virtual Student Mentors and Alumni GIST Mentors

- One student and three alumni mentors provided online support over the course of the 2023-2024 academic year.

Objective 4: Provide virtual GIST internships

- A total of 8 different virtual internships provided eight students with an internship in Capstone in Geospatial Technology. Seven Capstone students completed the virtual internship May of 2024. Coursework involves a personal GIST portfolio, competency exam, and either an unpaid internship or simulated internship through case studies. In either option, the student will work on the project for at least 45 hour, and it is for credit, and not paid.
- See unexpected positive results earlier to see details on paid internships.

Objective 5: Deliver innovative outreach and enriched virtual support from Public Librarians

- All objectives were reached by end of June of 2023. In the fall of 2023, four librarians attended the workshop focused on using GIS as a tool to explore Diversity, Equity, and Inclusion. Support/collaboration from MCC librarians continues at numerous events (e.g., Scholars' Day, Celebration of Learning).

Objective 6: Recruitment of Introductory GIST students and GIST Professionals

- Targeted recruitment efforts in the Introductory GIS courses have consisted of "Ask Me Anything" (AMA) sessions once a semester. These sessions consist of answering a list of student questions, as well as a discussion about GIS as a career.
- During spring of 2024, the project team presented at a local high school about our GIS program, and flyers were shared to over 50 students.
- Recruitment efforts for GIS professionals have consisted of exhibiting a booth at the New York State GIS conference (Fall 2023), a local GIS conference (spring 2024), publication in a prominent GIS magazine, as well as the use of social media. In addition, the Mapping Club hosted a workshop of using GIS as a tool to support Diversity, Equity, and Inclusion (25+ attended). In the spring of 2024, the Mapping Club hosted a humanitarian mapping event (20 attended).
- Unfortunately, due to high school and college administrative requirements and turnover, no dual credit courses were offered over the 2023-2024 year. It appears, administrative turnover has resulted in new goals, although the PI continues to make effort to collaborate with local high schools.

Key outcomes or Other achievements:

External evaluator Donna Lange reported that in year 4, "Meeting Workforce Needs for Skilled Geospatial Technicians through Virtual Geospatial Information Science Technology Education" has met or exceeded all project medium term outcomes at the end of year four." Here is a summary of her report:

- Established an effective model for offering engaging virtual GIST courses and internships.
- Implemented an alumni mentoring program model that effectively supports students and provides role models for students.
- Increased enrollment in GIST courses and the AAS and micro-credential programs.
- Exceeded target course and program enrollment numbers.
- Awarded GIST micro-credentials and AAS GIST degrees for a third cohort of students.
- Updated GIST course content to address emerging technologies and feedback from their advisory board, related professional organizations, and students.
- Increased enrollment of students from underrepresented groups to 36%.

Year 4 Outcomes:

1. Projected Outcome (year 3): 20 students will enroll in online Web Mapping, UAS Data Acquisition, and Programming for GIS, and 16 will pass (Obj. 1 and 2)

Actual Outcome (Year 4): By the end of year four, 56 students enrolled in Web Mapping and 52 passed (93%), while 32 students enrolled in Geospatial Data Acquisition and Management with 88% passing (28/32), and 26 enrolled in Introduction to Geospatial Programming with 92% passing (24/26).

2. Projected Outcome (year 3): 60 students will enroll in online Cartography and Spatial, and 48 will pass. (Obj. 2)

Actual Outcome (YR4): By year 4, 96 college students enrolled in Cartography and 89% passed (85/96). By year 4, 58 college students enrolled in Spatial Analysis and 86% passed (50/58).

3. Projected Outcome (year 3): 48 students will enroll in the online GIST Capstone Course, 42 will pass. (Obj. 2)

Actual Outcome (YR4): By the end of year 4, forty-none college students enrolled in online GIST Capstone Course and 90% passed (44/49).

4. Projected Outcome (year 3): 16 students will enroll in approved microcredential and 14 will graduate. (Obj. 2)

Actual Outcome (YR4): By the end of year 4, twenty-one students enrolled in the microcredential and 17 graduated. Year 2 was the first year the microcredential program was offered.

5. Projected Outcome (year 3): 15 new students will enroll annually into the AAS degree, attain an 80% retention rate in the programs first year (year 2 of grant) and a 85% retention rate the second year (year 3 of grant), graduating 14 students per year from the program (obj. 1 and 2).

Actual Outcome (YR4): Twelve students enrolled into the AAS degree, and one will graduate from the program in year 2. All students from year 2 were retained (100%) and graduated spring of 2023. A few additional students enrolled into the AAS degree, and a total of 13 graduated by spring of 2023 (yr 1 + 2 total). Five additional students enrolled into the program in 2024 for a total of 27 (year 1-4 total), all being retained. Note: *Some students earn the GIST Certificate or microcredential rather than the A.A.S.*

6. Projected Outcome (year 3): 360+ hours of online support will be provided from Alumni GIST/student mentors

Actual Outcome (YR4): Three alumni supported students for 15 weeks in the fall 2023 semester, and an additional 15 weeks spring of 2024 for a total of 180 hours. A total of 486 hours by year 4.

7. Projected Outcome (year 3): 18 students will complete a virtual internship (Obj. 4).

Actual Outcome (YR4): In year 1, 14 students completed a virtual internship, 11 in year 2, 12 in year three, and 8 in year four for a total of 45 students. Students were matched to their host based on their skills, and interests. The instructor in Capstone in Geospatial Technology met virtually with the hosts multiple times during the semester.

8. Projected Outcome (year 3): Ten recent graduates will receive a paid internship. (Obj. 4).

Actual Outcome (YR4): One recent graduate completed a paid internship summer of 2023, while three completed a paid internship summer of 2022. In addition, one student received a paid internship spring of 2024 for a total of fourteen by year 4.

As an outcome of the awarded (May, 2022) Skills Training in Advanced Research & Technology (START) supplement with Monroe Community College's GIST program & the University of Maine - Center for Advanced Forestry Systems (CAFS) project, two additional students received a paid internship summer of 2022. A collaboration with the Rochester Institute of Technology provided two additional students with a paid GIS experience summer of 2023, for a total of 7 in 2022.

Additional students have been given a paid internship through organizational funds. For example, one student had a paid internship through the Town of Greece, NY spring of 2022, and 1 to three are expected to have a paid internship with the Town of Farmington summer of 2023.

In the summer of 2024, three additional students will receive a paid internship thanks to a second NSF ATE START supplement with the University of Maine Center for Advanced Forestry Systems (CAFS). In addition, one more student will receive a paid internship fall of 2024 with CAFS.

9. Projected Outcome (year 3): 40 public and MCC librarians will participate in PD. (Obj.5)

Actual Outcome (YR4): No additional cohorts were provided PD in year 4. However, four volunteered and participated in a two hour workshop on using GIS as a tool to explore Diversity, Equity, and Inclusion

In year 3, a third cohort of nine librarians, predominantly from the Capital region and Hudson valley completed the all-day professional development workshop (Sept) and the follow up workshop (Oct) in year 3. In year 1, there were 12 that completed the all-day fall workshops and in year 2, there were 16 for a three-year total of 37. In addition, 11 more attended a two-hour training in the spring of year 2, over 50 in year 1, and one intern for a two-year total of 99.

10. Projected Outcome (year 3): Enrollment of underrepresented students in program will increase to 25% (Obj. 6)

Actual Outcome (YR4):

Previous data in underrepresented GIST Certificate students shows an increase from 10% in fall of 2019, 20% in fall of 2020, and 28% in fall of 2021. Since Fall of 2022, the A.A.S. in the GIST enrollment shows 5 of 13 as underrepresented giving us 38%. In By the spring of 2024, 7 of 18 A.A.S. students are underrepresented students giving us 38%.

11. Projected Outcome (year 3): 10% of introductory GIST students will be retained and 30 attend GIST summer camp (Obj. 6)

Actual Outcome (YR4): No additional students received a GIST Summer camp, however, over 40 high school students learned more about GIST and MCC's GIST program

In year 3, 32 high school students attended a virtual summer camp by year 3. Unfortunately, since these are minors, we have been unable to track these students. During COVID, dual credit offerings were hard to maintain as the technology to go virtual was cost prohibitive. Administrative changes and retirements have made new partnerships challenging.

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

A two-hour workshop (November 13) provided over twenty faculty, staff (including four librarians) with GIS tools to support diversity, equity, and inclusion. A 1.5 hour mapathon on March 21 was held and provided faculty, staff, and students with a workshop on remote humanitarian mapping. In addition, one Capstone student intern and a PI provided MCC's Institutional Research with support.

* Have the results been disseminated to communities of interest? If so, please provide details.

Dissemination has occurred at local events, regional, and national conferences.

- Senior Personnel Howard presented at GeoEd titled workshop: *Cultivating Successful Virtual Internships in GIS* (Aug 7-10, 2023)
- PI Little and SP Howard presented at the NY State GIS Conference GeoCon: *Virtual Internships GEG 239: Capstone in GIST* (Sept 2023). The focus was on a student's work with the Center for Advanced Forestry Systems: *"OpenCloudRemover": A Python-based QGIS Plugin for Efficient Cloud Removal from Sentinel2 Imagery Using Machine Learning.*
- MCC's GIST program highlighted at NY State GIS Conference/GeoCon with Monroe CC GIST slide.
- SP Howard led a drone day introduction to interested students and the public Sept , 2023.
- MCC Mapping Club led by PI Little hosted Dr. Joseph Kerski in a workshop titled: *Modern GIS Tools to Explore Diversity, Equity & Inclusion* (Nov 13, 2023)
- *One MCC GIST Remote Sensing student presented at MCC's Scholars' Day. Presentation titled: Using Remote Sensing and AI to classify Brownfields from the Chernobyl Nuclear Power Plant Disaster* (April, 2024).
- *One MCC Introduction to GIS student and one remote sensing student presented at MCC's Celebration of Learning (April, 2024)*
- *MCC Cartography student won first place in the student mapping competition at the GIS SIG conference (April, 2024).*

- MCC's student led mapping club held an in person and virtual mapathon April of 2024. The event was co-sponsored by the college's Holocaust, Genocide, and Human Rights Project. PI Little is the advisor for the club.
- In the fall of 2023, there was further collaboration by PI Little and PI Pierce with Anthony D'Abruzzo, Training Coordinator Office of Crime Analysis & Strategic Partnerships with the NYS Division of Criminal Justice Services.
- A new GIS Crime Dashboards class was offered successfully spring of 2024.
- The Micro-credential page continues to highlighted our GIST micro-credential, A.A.S. in GIST, and GIST Certificate. Go to: https://www.monroecc.edu/special-programs/geospatial-information-and-technology/
- The GIST Advisory Board was sent an email update May of 2024, seeking advice on a new survey that will assess the latest trends and tools used in the GIST workforce.
- Esri highlighted MCC's microcredential as a part of their online book series Fall of 2023.
- Two virtual Ask Me Anything webinars were hosted by MCC's GIST Mapping Club featuring two alumni fall of 2023, and spring of 2024. Audio recordings are available on the program's NSF ATE web site.
- Pi DuBreck sent emails to many list serv fall of 2023 and spring of 2024, highlighting the new GIST program opportunities, including the: New York State GIS Association, other state affiliated GIS Associations, and LinkedIn, MCC highlighted our geospatial program through social media, from X (formerly Twitter) to Facebook.
- MCC's Capstone course becomes a College Service Learning course.
- PI DuBreck went to two high school events spring of 2024, Women in Science and a Career Fair.
- The Monroe Community College (MCC) GIST program web site continues to be updated.   PI Little continues to update the NSF ATE Virtual GIST web site which includes all important events since the start of this grant.

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

- GIS Crime Dashboards will be taught fall of 2024 for the second time. This new course supports New York State public safety initiatives.
- Geospatial Data Acquisition and Management will be offered at Monroe Community College for the fourth time fall of 2024. The class will be offered as a remote live/hybrid course.
- Introduction to Geospatial Programming will be offered again for the fourth year, in the remote live/hybrid format during spring of 2025. Web Mapping will be offered a third time as well, completely online during spring of 2025.
- Introduction to GIS, Cartography, and Remote Sensing curriculum will be fine-tuned and modified as needed based on new materials from the 2024 GeoEd conference, and feedback from the NY State GIS Professional survey, MCC plans to send out June of 2024. As technology evolves, and artificial intelligence plays a larger role in the geospatial industry, a total of three modules need revision summer of 2024.
- Two alumni will continue to provide 60 hours of online support to students in Introduction to GIS, Remote Sensing, as well as Spatial Analysis and GIS. A fourth year of online alumni support will be given to students in Data Acquisition and Management as well as Introduction to Geospatial Programming.
- A new cohort of students will complete virtual internships in Capstone in Geospatial Technology.
- At least three students will receive a paid summer GIST internship with the Center for Advanced Forestry Systems (University of Maine), and an additional student fall of 2024.
- Recruitment efforts will focus more on the New York City region.
- Dissemination will continue at several GIS conferences.
  Supporting Files

	Filename	Description
(Download)	Year 4 Evaluation Report Final.pdf	External evaluator Donna Lange reported that in year 4, â€œMeetir Technicians through Virtual Geospatial Information Science Techn project medium term outcomes at the end of year four.â€•
(Download)	GIS_Day_Guest_Speaker_Joseph Kerski_F23.pdf	GIS Day workshop hosted by MCC, guest speaker Dr. Joseph Kersh
(Download)	NYSGIS_Sept2023_Final.pdf	NY State GIS Conference presentation slides
(Download)	Mapathon 2024.pdf	Virtual Humanitarian Mapathon flyer

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Products

Books

Book Chapters

Inventions

Journals or Juried Conference Papers

View all journal publications currently available in the NSF Public Access Repository for this award.

The results in the NSF Public Access Repository will include a comprehensive listing of all journal publications recorded to date that are associated with this award.

Licenses

Other Conference Presentations / Papers

Other Products

Other Publications

Patent Applications

Technologies or Techniques

Thesis/Dissertations

Websites or Other Internet Sites

- *Audio: Ask Me Anything session (May 9, 2024)*
  https://monroecc.video.yuja.com/V/Video?v=10358532&node=44678631&a=185713096

  Ask Me Anything session (May 9, 2024) audio with alumni Catherine DuBreck.

- *How to Modernize GIS Education with a Microcredential to Ensure Workplace Success*
  https://www.esri.com/en-us/lg/industry/education/stories/ensuring-workplace-success-with-a-gis-microcredential

  Esri user story titled: How to Modernize GIS Education with a Microcredential to Ensure Workplace Success

- *MCC's GIST web site*
  http://www.monroecc.edu/go/geospatial

  The college's GIST home page.

- *NSF ATE Virtual GIST Main Web Site*
  https://ate.is/MCC-GIST

  Meeting Workforce Needs for Skilled Geospatial Technicians through Virtual Geospatial Information Science Technology Education activities in 2020-2024.

- *NSF funding brings industry-integrated education to GIS curriculum*
  https://www.albany.edu/geographyplanning/news/2023-nsf-funding-brings-industry-integrated-education-gis-curriculum

  The PI and a colleague from SUNY Albany visited two universities of applied sciences in Germany summer of 2023. The visit allowed the PI and the colleague to bring geospatial industry-integrated training experiences to their specific GIS curriculum, including a virtual internship spring of 2024.

- *Video by Dr. Kerski (Esri) about MCC's GIST program*
  https://www.youtube.com/watch?v=dSTjvw9LFiQ

  Video created by Dr. Joseph Kerski after visiting MCC Nov 2024

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Participants/Organizations

What individuals have worked on the project?

Little, Jonathan	PD/PI	
DuBreck, Catherine	Co PD/PI	
Pierce, Heather	Co PD/PI	

Full details of individuals who have worked on the project:

Jonathan Little
Email: jlittle@monroecc.edu
Most Senior Project Role: PD/PI
Nearest Person Month Worked: 2
Contribution to the Project: Contribution to the Project: Jonathon Little led curriculum development for the new A.A.S. in G
with professional development for MCC and public librarians (Obj. 5). He oversees dissemination, recruitment efforts (Obj.6)
(Obj. 2); and developed, coordinated, and assisted in the implementation of the virtual GIST internships (Obj. 4) as well as the
and final reports, monitor all project activities, and interact with the external evaluator.
Funding Support: $7,869, 2 months, Summer 2023. Grant pays Other Personnel for equivalent of 4 Release Hours in Fall 202
Change in active other support: No
International Collaboration: Yes, Germany
International Travel: Yes, Germany - 0 years, 0 months, 14 days; Netherlands - 0 years, 0 months, 6 days

Catherine M DuBreck
Email: cdubreck@gmail.com
Most Senior Project Role: Co PD/PI
Nearest Person Month Worked: 1
Contribution to the Project: Contribution to the Project: Catherine DuBreck shared information about the GIST events as the
social media (Obj. 6).
Funding Support: $0.0 month Summer 2023, $1,550 0.25 month Fall 2023 and Spring 2024.
Change in active other support: No
International Collaboration: No
International Travel: No

Heather Pierce
Email: hpierce@monroecc.edu
Most Senior Project Role: Co PD/PI
Nearest Person Month Worked: 2

Contribution to the Project: Heather Pierce reviewed all new course materials, aligned courses with industry standards, and
Spatial Analysis to online and taught each course (Obj. 3). She also updated labs in Introduction to GIS (Obj. 2). She develope
Funding Support: $4,365, 0.75 month, Summer 2023. Grant pays Other Personnel for equivalent of 3 Release Hours in Fall 2
Change in active other support: No
International Collaboration: No
International Travel: No

What other organizations have been involved as partners?

Nothing to report.

Were other collaborators or contacts involved? If so, please provide details.

- New
- The Institute for Applied Photogrammetry and Geoinformatics at Jade University of Applied Sciences (Germany)
- Bochum University of Applied Sciences (Germany)
- SUNY Albany Geography and Planning Department
- University of Maine Center for Advanced Forestry Systems
- Schoodic Institute
- University of Maine at Fort Kent
- Barbara Wheatland Geospatial Lab at U of Maine
- Holocaust, Genocide, and Human Rights Project (HGHRP)
- Washington State Department of Health
- Saving Africa's Nature (SANA)
- State Department of Health SUNY Albany
- River AreaCouncil of Governments
- National GeoTech Center of Excellence
- Water for South Sudan
- Cornell University
- New York Sea Grant
- New York GIS Association
- Geographical Information Sharing – Special Interest Group (GIS-SIG)
- MRB Group
- FLOW - Traverse City
- Genesee Land Trust
- The Nature Conservancy
- NYS Department of Environmental Conservation
- New York Geographic Alliance
- SUNY Cortland Geography
- Syracuse University Information Library Sciences
- EagleView
- LaBella Associates
- Rochester City School District
- Webster Central School District
- University of Rochester
- Rochester Institute of Technology

- American Red Cross
- Youth Mappers (funded by The United States Agency for International Development)
- Upward Bounds
- Rochester Regional Library Council
- Pioneer Library System Monroe County Library System
- Capital District Library Council

Impacts

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

As a result of successfully bringing geospatial awareness to many public librarians, MCC librarians have partnered with the GIST program to bring AI to the classroom. The MCC Global Education Department has partnered with the GIST program to bring workshops on GIS to high school counselors (June 2024). MCC's Institutional Research is now utilizing GIS to support their work.

A couple of four-year universities across New York State and Maine are now interested in partnering with our advanced GIST students to support their research efforts in GIS.

What is the impact on other disciplines?

As a result of a presentation at the NY State GIS conference on how virtual internships provide equitable experiences, government organizations that use GIS are more open to the idea of virtual internships. Furthermore, interest at MCC in virtual internships has increased. The PI is in the early stages of writing a new NSF ATE proposal focused on hybrid (virtual and in person) internships in geospatial technology and other workforce field, with a focus on strategies to support diversity, equality and inclusion in STEM internships.

What is the impact on the development of human resources?

Four librarians as well as a few College staff and faculty received tools on how to use GIS as a tool to support diversity, equity and inclusion. One librarian is furthering their education in GIST, and plans to complete the GIST Certificate.

What was the impact on teaching and educational experiences?

The microcredential in GIST was the college's first. Several micro-credentials have been submitted after others have noted strong student interest in microcredentials. In addition, the State University has continued to reach out to the PI to support their efforts in expanding microcredentials. The program plans to add an additional microcredential for introductory students in GIST in the next year.

What is the impact on physical resources that form infrastructure?

As a result of the increased use of the virtual desktop, the college has used their own funds to purchase a virtual desktop failover system to avoid any student interruptions. In addition, the college has purchased 20 high end laptops for those students that have the need in the geospatial technology and geoscience program.

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?

Geospatial technologies are increasingly important for understanding our complex world. Many specialize in areas such as agriculture, mining, health care, retail trade, urban planning, crime mapping, or military intelligence. For example, the New York State Division of Criminal Justice Services has reached out to our program and as a result, we provided them with a unique course that integrates two new GIS courses on geospatial data acquisition and web mapping. The new course is called GIS Crime Dashboards.

Seven students completed the virtual internship spring of 2024. In this year's cohort, three GIST students plan to take receive a paid internship summer of 2024, two plan to seek GIST employment, and two plan to transfer to a four-year university.

What percentage of the award's budget was spent in a foreign country?

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

Nothing to report.

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.

Change in primary performance site location

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.

Nothing to report.