

# RPPR - Preview Report

## Cover

Federal Agency and Organization Element to Which Report is Submitted:

4900

Federal Grant or Other Identifying Number Assigned by Agency:

1263061

Project Title:

REU Site: Arctic and Antarctic Project (AaA-REU) with Research Experience for Teachers (RET) Component

PD/PI Name:

- Linda B Hayden, Principal Investigator
- Geoffrey C Fox, Co-Principal Investigator
- S. Prasad Gogineni, Co-Principal Investigator

Recipient Organization:

Elizabeth City State University

Project/Grant Period:

07/01/2013 - 06/30/2017

Reporting Period:

07/01/2015 - 06/30/2016

Submitting Official (if other than PD\PI):

- Linda B Hayden
- Principal Investigator

Submission Date:

06/28/2016

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

Linda B Hayden

## Accomplishments

### \* What are the major goals of the project?

The vision for this project is driven by the compelling need to draw on the integration of research and education to attract a diverse pool of talented students into careers related to,

polar science, and cyberinfrastructure (CI), including teaching and education research.

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

Major Activities:

The summer 2015 program consisted of 23 undergraduates, each student was assigned to a specific research team, where they worked closely with the faculty. Twenty of these students were supported by the AaA REU grant and three was supported by non-grant funds. Of the twenty, eleven students were assigned to the ECSU site, 2 assigned to the PSU site, 3 assigned to the IU site and 5 assigned to the KU site. Highlights are available at <http://nia.ecsu.edu/reuomps2013/index.html>.

The project was conducted for eight weeks during summer 2015, with on-line mentoring and follow-up during academic year. The program also included a Research Experience for Teachers (RET) component, which involves 4 pre-service STEM education majors.

Specific Objectives:

Significant Results:

Key outcomes or Other achievements:

**Juneau, Alaska - Juneau Icefield Research Program (JIRP) - June 23 to August 18, 2015** This summer, the program offered unique opportunities for both long-term education and workforce development activities in collaboration with the Juneau Icefield Research Program in Alaska . Through treks to local glaciers, the Juneau program offered participants an opportunity to increase their knowledge of glaciers and learn the skills required to function as a team on the ice. The participation of the two JIRP students was supported through a supplement to the AaA REU grant. One female African American and one male African American participated in the JIRP 2015 program. Both Khaliq Satchell and Tatayana Matthews were former AaA REU interns.

More information on the JIPR REU participants can be found at <http://nia.ecsu.edu/reuomps2015/teams-juneau.html>.

**Apple HBCU Scholars Program**

Khaliq Satchell and Tatayana Matthews, both juniors and former REU students, were among the 30 students from HBCUs around the country who were selected for the Apple HBCU Scholars Program. They each will receive up to \$25,000 in scholarship money for their senior year and participate in a summer internship at Apple's headquarters in Cupertino, Calif. During the next academic year they will have the opportunity to participate in a career preparation program and be paired with a mentor from Apple.

**2015 IEEE Geoscience and Remote Sensing Symposium**

On July 26-31, 2015 three past REU participants made presentations at the 2015 IEEE Geoscience and Remote Sensing Symposium (IGARSS) in Milan, Italy. This year's symposium theme was: "Remote Sensing: Understanding the Earth for a Safer World" and provided a remote sensing forum for obtaining up-to-date information about the latest developments, exchanging ideas, identifying future trends, and making networking with the international geoscience and remote sensing community. The 2015 technical program included themes such as data analysis methods, atmosphere, cryosphere, oceans, land, missions/sensors calibration, data

management, and education. There was also a special session sponsored by CReSIS which highlighted the accomplishments of Dr. Richard Moore. Student travel was partially supported by the GRSS Minority Travel Program funds. See <http://nia.ecsu.edu/ur/2015/igarss15/igarss15.html>

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

Workshops related to professional development were integrated into the daily schedule for all REU participants. Below are some of the training sessions in which REU students participated during this report period.

**Experience for Undergraduates Program Professional Development Seminar** June 15, 2015, 8:15a.m. – 1:15p.m. topics included Interdisciplinary Research Opportunities at the University of Kansas and Skills for Success: Effective Communication and Advocacy. The program was co-funded by the Madison and Lila Self Graduate Fellowship Program.

**Responsible Conduct of Research Workshop:** Monday June 1st, 4-5pm. This session served as a follow up to the CITI Program Tutorials that we recommend all students complete: <https://www.citiprogram.org>. The workshop was repeated at ECSU on June 25<sup>th</sup>.

**Abstract Writing Workshop** Monday, July 13th, 4-5 pm. Writing an abstract can be a difficult task, especially if you've never done it before. Participants in this workshop learned abstract-writing basics and to work on a rough draft.

**Poster Presentation Basics Workshop** Monday, July 20th, 4-5pm. This was an interactive session about the nuts and bolts of putting together a poster presentation. We recommend that students watch our online Research Byte prior to attending this session: <http://ugresearch.ku.edu/student/researchbytes/poster-presentation-basics>

**Seaspace Terascan Ground Station Operation Training** June 8–12, 2015. Elizabeth City State University, CERSER program hosted training sessions in Dixon Patterson hall for students and staff the Terascan system. SeaSpace Terascan software is Linux based software for processing data overlays and images in various formats from polar orbiting and geostationary satellites. Participants learned how to collect and manipulate information from multi-spectral satellites in the Terascan software.

SYLLABUS *for* 1.0 Task - TeraScan® System Training

Elizabeth City State University

Training Date: June 8 – 12, 2015

Trainer: David Mobley

Day 1:

- a) Perform system check to ensure all system hardware is in proper operating order.
- b) Perform LINUX Kit and/or other hardware upgrades, as applicable.

c) Verify reception and processing of all currently active satellites.

d) Install latest versions of TeraVision

Day 2:

TeraScan System Overview Satellites and Sensors TeraVision

Day 3:

Operating Procedures (as applicable) TeraScan File System

Using TeraMaster to Create Areas of Interest

Day 4:

Automatic Generation and Distribution of TeraScan Products using TeraPGS

TeraPGS to Batch Processing

Using Custom Scripts to Generate Products with PGS Express

TeraScan Data Processing - Applicable Telemetry

Startup/Shutdown of the System

Day 5:

Training System Setup Operations System Hardware Troubleshooting

### **IEEE Formatting Workshop**

Workshop covered IEEE Standard format for writing a scientific paper. Information on templates, IEEE compliance and copyrights was covered.

### **Hand-held GPS devices Workshop:**

Students received instructions on how to operate the GPS devices. They were then presented with the challenge of navigating to preselected local sites and recording data. Pairs of students used hand-held GPS to complete the tasks.

**More information on professional development opportunities** can be found at the URLs:

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

#### **Research Experiences for Undergraduates Symposium (REUS):**

This conference featured keynote presentations, presentations by students from Research Experiences for Undergraduates (REU) programs in all disciplines, sessions for REU students, faculty, and administrators, and opportunities to present to representatives from the National Science Foundation (NSF). Poster sessions were displayed in the NSF atrium. While there students met with Polar Science program officers and staff. The AaA REU program was represented by Maeah J. Walthall who took part in the Summer of 2015 REU at ECSU. Her research was titled "Autochamber Measurements of Net Ecosystem (CO<sub>2</sub>) Exchange at a Subarctic Mire in

Northern Sweden. Her mentor, an ECSU graduate, was Mr. Ryan Lawrence, a graduate student at the University of New Hampshire. Ms. Walthall's poster can be found at:

<http://nia.ecsu.edu/reuomps2015/teams/arctic/Slide1.jpg>. Dr. Linda Hayden, principal investigator of the Center of Excellence in Remote Sensing and Education (CERSER), also attended the symposium. One of the speakers, Dr. Nicole Bennett, Program Director, Division of Undergraduate Education, National Science Foundation, gave a talk titled "The NSF REU Program: Establishing a Lifetime of Discovery." She spoke on how undergraduate researchers form the foundation for building a coherent body of knowledge. She told the audience "Your next steps should be to take ownership of your vision as a scientist. Push the science forward. More information on this event can be found at <http://nia.ecsu.edu/ur/1516/151025nsf/>.

### **AGU Fall Conference**

On December 14-18, 2015, AaA REU students and mentors attended the 2015 American Geophysical Union (AGU) Fall Meeting in San Francisco. The AGU Fall Meeting is the largest conference in the geophysical sciences with earth and space scientist, students, teachers, and others in attendance. Presenting students (listed below) were also joined by Ms. Steffi Walthall and Mr. Kaiem Frink. Highlights from this event including links to the presentations can be found at <http://nia.ecsu.edu/ur/1516/151216agu/>. Presenting students included:

Maeah Walthall, Junior, George Mason University

"Automatic chamber measurements of Net Ecosystem (CO<sub>2</sub>) Exchange at a Subarctic Mire in Northern Sweden"

Charlie Nelson, Senior, Kentucky State University

"Validation of the Antarctic Snow Accumulation and Ice Discharge Basal Stress Boundary in the South Eastern Region of the Ross Ice Shelf, Antarctica"

Derek Morris, Jr, Junior, Elizabeth City State University

"Implementation of an interactive database interface utilizing HTML, PHP, JavaScript, and MySQL in support of water quality assessments in the Northeastern North Carolina Pasquotank Watershed"

Jamal Stevenson, Sophomore, Mississippi Valley State University

"A Corresponding Study of Water Quality Evaluation of the Pasquotank Watershed in Northeastern North Carolina"

### **Supercomputing 2015**

The Supercomputing 2015 (SC 2015) took place in Austin, Texas on November 16 – 19, 2015. As part of the conference, past AaA REU students participated in the Broader Engagement Program. The goal is to increase the participation of individuals who have been traditionally under-represented in High Performance Computing (HPC). Students participating this year were Omar Owens, Anthony Scott, and Maya Smith from Winston Salem State University, and Derek Morris from Elizabeth City State University. A virtual poster on the IU contribution to the AaA REU program was on display at SC 2015.

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

There will be one last cohort of AaA REU students during summer 2016. The staff submitted a renewal proposal during 2015 which was not funded. We will resubmit this proposal during the next solicitation.

## Supporting Files

|                            | Filename                  | Description   | Uploaded By  | Uploaded On |
|----------------------------|---------------------------|---|--------------|-------------|
| <a href="#">(Download)</a> | 2015_ecsu_ure_flyer-1.pdf | The flier contains highlights from the 2015 AaA REU program including participant research abstracts, academic year follow-up events, research presentations and Research Experience for Teachers (RET) activities. | Linda Hayden | 06/28/2016  |

## Products

### Books

### Book Chapters

### Inventions

### Journals or Juried Conference Papers

- Andrew Brumfield, Tori Wilbon, Jefferson Ridgeway, Linda Hayden (2015). Update of the CERSER TeraScan Cataloguing System and the TeraScan Image Processing Scripts. *2015 IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*. (26-31 July), 1362. Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes ; DOI: 10.1109/IGARSS.2015.7326029
- Raveen McKenzie, Jamal Stevenson, Jeff Wood, Linda Hayden (2015). A Comparative Study to the 2011/2013 Water Quality Assessments in the Pasquotank Watershed in Northeastern North Carolina with a Sea Level Rise Component. *2015 IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*. (26-31 July), . Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes ; DOI: 10.1109/IGARSS.2015.7326029
- Shanecia Beckworth, Dominique Marshall, Ryan Lawrence, Dr. Malcolm LeCompte, Dr. Linda B. Hayden (2015). Ground Penetrating Radar Survey of Edenton Green for Early Structural Remains. *2015 IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*. July 26 . Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes ; DOI: 10.1109/IGARSS.2015.7326029

### Licenses

### Other Conference Presentations / Papers

- Jennah Seaver, Cheri Hamilton (2015). *Analyzing the Efficacy of the Addition of a Survival Unit into the*

Science Program “Ice, Ice, Baby” to promote environmental awareness on behalf of the Center for Remote Sensing of Ice Sheets.. SACNAS. Washington, DC. Status = OTHER; Acknowledgement of Federal Support = Yes

- Maeah Walthall, Xavier Parker-Smith, Ryan Lawrence, Linda Hayden (2015). *Autochamber measurements of Net Ecosystem (CO2) Exchange at a subarctic mire in Northern Sweden*. SACNAS. Washington, DC. Status = OTHER; Acknowledgement of Federal Support = Yes
- Kamberlin King, Charlie Nelson, Ayanna Overton, Michael Jefferson Jr., Linda Hayden (2015). *Validation of the Antarctic Snow Accumulation and Ice Discharge Basal Stress Boundary in the South Eastern Region of the Ross Ice Shelf, Antarctica*. SACNAS. Washington, DC. Status = OTHER; Acknowledgement of Federal Support = Yes

## Other Products

## Other Publications

## Patents

## Technologies or Techniques

## Thesis/Dissertations

## Websites

- *2015 Arctic and Antarctic REU Program Website*  
<http://nia.ecsu.edu/reuomps2015/>

The website documents the 2015 REU program. There are links to the IU, KU, ECSU, and Juneau sites containing participants photos, contact information and their research abstracts. There are also links to the program schedule and highlight pages from major program activities. A copy of the closing program can also be found at this URL.

## Supporting Files

|                            | Filename                              | Description   | Uploaded By  | Uploaded On |
|----------------------------|---------------------------------------|---|--------------|-------------|
| <a href="#">(Download)</a> | 2015_CReSIS_REU_RET_Evaluation_dm.pdf | File contains the report from the 2015 program evaluator. Report contains an executive summary, participant profiles and evaluation findings. | Linda Hayden | 06/25/2016  |

# Participants/Organizations

## Research Experience for Undergraduates (REU) funding

Form of REU funding support:

REU site award

How many REU applications were received during this reporting period?

54

How many REU applicants were selected and agreed to participate during this reporting period?

23

REU Comments:

## What individuals have worked on the project?

| Name                                    | Most Senior Project Role                                 | Nearest Person Month Worked |
|---|--|-----------------------------|
| <a href="#">Hayden, Linda</a>           | PD/PI  | 1                           |
| <a href="#">Fox, Geoffrey</a>           | Co PD/PI   | 1                           |
| <a href="#">Gogineni, S. Prasad</a>     | Co PD/PI   | 1                           |
| <a href="#">Dixon, Ricky (RET)</a>      | Research Experience for Undergraduates (REU) Participant | 2                           |
| <a href="#">Feathers, Austin</a>        | Research Experience for Undergraduates (REU) Participant | 2                           |
| <a href="#">Hathaway, Jessica (RET)</a> | Research Experience for Undergraduates (REU) Participant | 2                           |
| <a href="#">Headen, James</a>           | Research Experience for Undergraduates (REU) Participant | 2                           |
| <a href="#">King, Kamberlin</a>         | Research Experience for Undergraduates (REU) Participant | 2                           |
| <a href="#">Marcotte, Laurissa</a>      | Research Experience for Undergraduates (REU) Participant | 2                           |
| <a href="#">Mcenzie, Raveen</a>         | Research Experience for Undergraduates (REU) Participant | 2                           |
|   | Research Experience for Undergraduates (REU)             |                             |



|  |   |   |
|--|---|---|
| <a href="#">Morris, Derek</a>              | Participant   | 2 |
| <a href="#">Nelson, Charlie</a>            | Research Experience for Undergraduates (REU)<br>Participant | 2 |
| <a href="#">Overton, Ayanna</a>            | Research Experience for Undergraduates (REU)<br>Participant | 2 |
| <a href="#">Owens, Omar</a>                | Research Experience for Undergraduates (REU)<br>Participant | 2 |
| <a href="#">Parker, Xavier</a>             | Research Experience for Undergraduates (REU)<br>Participant | 2 |
| <a href="#">Scott, Anthony</a>             | Research Experience for Undergraduates (REU)<br>Participant | 2 |
| <a href="#">Seaver, Jenna<br/>(RET)</a>    | Research Experience for Undergraduates (REU)<br>Participant | 2 |
| <a href="#">Smith, Maya</a>                | Research Experience for Undergraduates (REU)<br>Participant | 2 |
| <a href="#">Stevenson, Jamal<br/>(RET)</a> | Research Experience for Undergraduates (REU)<br>Participant | 2 |
| <a href="#">Varuolo-Clark,<br/>Arianna</a> | Research Experience for Undergraduates (REU)<br>Participant | 2 |
| <a href="#">Walthall, Maeah</a>            | Research Experience for Undergraduates (REU)<br>Participant | 2 |
| <a href="#">Walthall, Steffie</a>          | Research Experience for Undergraduates (REU)<br>Participant | 2 |
| <a href="#">Whistler, Abbey</a>            | Research Experience for Undergraduates (REU)<br>Participant | 2 |

**Full details of individuals who have worked on the project:**

**Linda B Hayden**

**Email:** haydenl@mindspring.com

**Most Senior Project Role:** PD/PI

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Served as PI. Managed recruitment, selection, financial arrangements and assignment of students to research sites.

**Funding Support:** No funds were paid during this reporting period.

**International Collaboration:** No

**International Travel:** Yes, italy - 0 years, 0 months, 7 days

**Geoffrey C Fox**

**Email:** gcf@indiana.edu

**Most Senior Project Role:** Co PD/PI

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Served as research mentor for students assigned to the University of Indiana site.

**Funding Support:** No funds were received

**International Collaboration:** No

**International Travel:** No

**S. Prasad Gogineni**

**Email:** pgogineni@ku.edu

**Most Senior Project Role:** Co PD/PI

**Nearest Person Month Worked:** 1

**Contribution to the Project:** Served as research mentor for students assigned to the University of Kansas site.

**Funding Support:** No funds were paid during this reporting period.

**International Collaboration:** No

**International Travel:** No

**Ricky (RET) Dixon**

**Email:** ricky\_d\_1994@yahoo.com

**Most Senior Project Role:** Research Experience for Undergraduates (REU) Participant

**Nearest Person Month Worked:** 2

**Contribution to the Project:** Student researcher

**Funding Support:** PLR-1263061

**International Collaboration:** No

**International Travel:** No

**Year of schooling completed:** Pre-College Teacher

**Home Institution:** MVSU

**Government fiscal year(s) was this REU participant supported:** 2015, 2014

**Austin Feathers**

**Email:** afeathers1@gmail.com

**Most Senior Project Role:** Research Experience for Undergraduates (REU) Participant

**Nearest Person Month Worked:** 2

**Contribution to the Project:** Student researcher

**Funding Support:** PLR-1263061

**International Collaboration:** No

**International Travel:** No

**Year of schooling completed:** Junior

**Home Institution:** Univ. of Kansas

**Government fiscal year(s) was this REU participant supported:** 2015

**Jessica (RET) Hathaway**

**Email:** hathawayjessica18@gmail.com

**Most Senior Project Role:** Research Experience for Undergraduates (REU) Participant

**Nearest Person Month Worked:** 2

**Contribution to the Project:** Student researcher

**Funding Support:** PLR-1263061

**International Collaboration:** No

**International Travel:** No

**Year of schooling completed:** Pre-College Teacher

**Home Institution:** ECSU

**Government fiscal year(s) was this REU participant supported:** 2015

**James Headen**

**Email:** jmheaden@gmail.com

**Most Senior Project Role:** Research Experience for Undergraduates (REU) Participant

**Nearest Person Month Worked:** 2

**Contribution to the Project:** Student researcher

**Funding Support:** PLR-1263061

**International Collaboration:** No

**International Travel:** Yes, canada - 0 years, 2 months, 0 days

**Year of schooling completed:** Other

**Home Institution:** ecsu

**Government fiscal year(s) was this REU participant supported:** 2015

**Kamberlin King**

**Email:** kamberkin.king@mvsu.edu

**Most Senior Project Role:** Research Experience for Undergraduates (REU) Participant

**Nearest Person Month Worked:** 2

**Contribution to the Project:** STUDENT INVESTIGATOR

**Funding Support:** NSF PLR-1263061

**International Collaboration:** No

**International Travel:** No

**Year of schooling completed:** Sophomore

**Home Institution:** Mississippi Valley State University

**Government fiscal year(s) was this REU participant supported:** 2015

**Laurissa Marcotte**

**Email:** laurissa@ku.edu

**Most Senior Project Role:** Research Experience for Undergraduates (REU) Participant

**Nearest Person Month Worked:** 2

**Contribution to the Project:** Student researcher

**Funding Support:** PLR-1263061

**International Collaboration:** No

**International Travel:** No

**Year of schooling completed:** Junior

**Home Institution:** Univ. of Kansas

**Government fiscal year(s) was this REU participant supported:** 2015

**Raveen Mcenzie**

**Email:** kamberlin.king@mvsu.edu

**Most Senior Project Role:** Research Experience for Undergraduates (REU) Participant

**Nearest Person Month Worked:** 2

**Contribution to the Project:** Student researcher

**Funding Support:** PLR-1263061

**International Collaboration:** No

**International Travel:** No

**Year of schooling completed:** Junior

**Home Institution:** MVSU

**Government fiscal year(s) was this REU participant supported:** 2015, 2014

**Derek Morris**

**Email:** dmow4454@gmail.com

**Most Senior Project Role:** Research Experience for Undergraduates (REU) Participant  
**Nearest Person Month Worked:** 2

**Contribution to the Project:** STUDENT INVESTIGATOR

**Funding Support:** NSF PLR-1263061

**International Collaboration:** No

**International Travel:** No

**Year of schooling completed:** Junior

**Home Institution:** Elizabeth City State University

**Government fiscal year(s) was this REU participant supported:** 2015, 2014

**Charlie Nelson**

**Email:** charlie.nelson@kysu.edu

**Most Senior Project Role:** Research Experience for Undergraduates (REU) Participant

**Nearest Person Month Worked:** 2

**Contribution to the Project:** STUDENT INVESTIGATOR

**Funding Support:** NSF PLR-1263061

**International Collaboration:** No

**International Travel:** No

**Year of schooling completed:** Junior

**Home Institution:** Kentucky State University

**Government fiscal year(s) was this REU participant supported:** 2015

**Ayanna Overton**

**Email:** Ayannaov@aol.com

**Most Senior Project Role:** Research Experience for Undergraduates (REU) Participant

**Nearest Person Month Worked:** 2

**Contribution to the Project:** STUDENT INVESTIGATOR NSF PLR-1263061

**Funding Support:** NSF PLR-1263061

**International Collaboration:** No

**International Travel:** No

**Year of schooling completed:** Sophomore

**Home Institution:** NCAT

**Government fiscal year(s) was this REU participant supported:** 2015

**Omar Owens**

**Email:** oowens112@gmail.com

**Most Senior Project Role:** Research Experience for Undergraduates (REU) Participant

**Nearest Person Month Worked: 2**

**Contribution to the Project:** Student researcher

**Funding Support:** PLR-1263061

**International Collaboration:** No

**International Travel:** No

**Year of schooling completed:** Junior

**Home Institution:** WSSU

**Government fiscal year(s) was this REU participant supported:** 2015, 2014

**Xavier Parker**

**Email:** xavierparkersmith@yahoo.com

**Most Senior Project Role:** Research Experience for Undergraduates (REU) Participant

**Nearest Person Month Worked: 2**

**Contribution to the Project:** Student researcher

**Funding Support:** PLR-1263061

**International Collaboration:** No

**International Travel:** No

**Year of schooling completed:** Sophomore

**Home Institution:** NCAT

**Government fiscal year(s) was this REU participant supported:** 2015

**Anthony Sherrod Scott**

**Email:** ascott112@rams.wssu.edu

**Most Senior Project Role:** Research Experience for Undergraduates (REU) Participant

**Nearest Person Month Worked: 2**

**Contribution to the Project:** STUDENT INVESTIGATOR

**Funding Support:** NSF PLR-1263061

**International Collaboration:** No

**International Travel:** No

**Year of schooling completed:** Junior

**Home Institution:** Winston-Salem State University

**Government fiscal year(s) was this REU participant supported:** 2015, 2014

**Jannah (RET) Seaver**

**Email:** jannahseaver@yahoo.com

**Most Senior Project Role:** Research Experience for Undergraduates (REU) Participant

**Nearest Person Month Worked: 2**

**Contribution to the Project:** Student researcher

**Funding Support:** PLR-1263061

**International Collaboration:** No

**International Travel:** No

**Year of schooling completed:** Pre-College Teacher

**Home Institution:** Haskell Indian Nation

**Government fiscal year(s) was this REU participant supported:** 2015, 2014

**Maya Smith**

**Email:** smith.maya2011@gmail.com

**Most Senior Project Role:** Research Experience for Undergraduates (REU) Participant

**Nearest Person Month Worked:** 2

**Contribution to the Project:** Student researcher

**Funding Support:** PLR-1263061

**International Collaboration:** No

**International Travel:** No

**Year of schooling completed:** Junior

**Home Institution:** WSSU

**Government fiscal year(s) was this REU participant supported:** 2015, 2014

**Jamal (RET) Stevenson**

**Email:** jamalstevenson59@yahoo.com

**Most Senior Project Role:** Research Experience for Undergraduates (REU) Participant

**Nearest Person Month Worked:** 2

**Contribution to the Project:** Student researcher

**Funding Support:** PLR-1263061

**International Collaboration:** No

**International Travel:** No

**Year of schooling completed:** Pre-College Teacher

**Home Institution:** MVSU

**Government fiscal year(s) was this REU participant supported:** 2015

**Arianna Varuolo-Clark**

**Email:** arianna.varuolo-clark@lyndonstate.edu

**Most Senior Project Role:** Research Experience for Undergraduates (REU) Participant

**Nearest Person Month Worked:** 2

**Contribution to the Project:** Student researcher

**Funding Support:** PLR-1263061

**International Collaboration:** No

**International Travel:** Yes, canada - 0 years, 2 months, 0 days

**Year of schooling completed:** Junior

**Home Institution:** Lyndon State

**Government fiscal year(s) was this REU participant supported:** 2015

**Maeah Walthall**

**Email:** mwalthal@gmu.edu

**Most Senior Project Role:** Research Experience for Undergraduates (REU) Participant

**Nearest Person Month Worked:** 2

**Contribution to the Project:** Student researcher

**Funding Support:** PLR-1263061

**International Collaboration:** No

**International Travel:** No

**Year of schooling completed:** Sophomore

**Home Institution:** George Mason

**Government fiscal year(s) was this REU participant supported:** 2015

**Steffie Walthall**

**Email:** swalth20@student.scad.edu

**Most Senior Project Role:** Research Experience for Undergraduates (REU) Participant

**Nearest Person Month Worked:** 2

**Contribution to the Project:** Student researcher

**Funding Support:** PLR-1263061

**International Collaboration:** No

**International Travel:** No

**Year of schooling completed:** Junior

**Home Institution:** Savannah College of Art and Design

**Government fiscal year(s) was this REU participant supported:** 2015

**Abbey Whistler**

**Email:** awhisler08@gmail.com

**Most Senior Project Role:** Research Experience for Undergraduates (REU) Participant

**Nearest Person Month Worked:** 2

**Contribution to the Project:** Student researcher

**Funding Support:** PLR-1263061



**International Collaboration:** No

**International Travel:** No

**Year of schooling completed:** Junior

**Home Institution:** Univ. of Kansas

**Government fiscal year(s) was this REU participant supported:** 2015

### What other organizations have been involved as partners?

| Name   | Type of Partner Organization                 | Location  |
|--|--|---|
| <a href="#">The Association of Computer/Information Sciences and Enginee</a> | Other Organizations<br>(foreign or domestic) | Winston Salem State<br>University/Spelman College |

### Full details of organizations that have been involved as partners:

#### The Association of Computer/Information Sciences and Enginee

**Organization Type:** Other Organizations (foreign or domestic)

**Organization Location:** Winston Salem State University/Spelman College

#### Partner's Contribution to the Project:

Financial support

Personnel Exchanges

**More Detail on Partner and Contribution:** ADMI helps to identify REU participants and provides the AaA-REU students with travel funds to attend their annual conference. ADMI also provides stipends for a portion of the students selected.

### What other collaborators or contacts have been involved?

**JIRP:** Foundation for Glacier and Environmental Research Juneau Icefield Research Program 4616 25th Avenue NE, PMB302 Seattle, WA 98105

## Impacts

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

REU students have: *Calibrated* a radar to use on the Greenland ice sheet, *Analyzed* the stability of a remote controlled aircraft for use in Antarctica, *Designed* and built a sled to help measure ice layers in Greenland, *Debugged* wireless communications for collecting data on the ice sheets, *Calculated* Antarctic snow accumulation using radar data, *Learned* about ice streams speeding up and ice shelves collapsing and Worked with world-class scientists to understand and predict the role of polar ice sheets in sea level change. The program has served as a launching point for an estimated 20+ undergraduate students each year to study with research teams at Elizabeth City State University, the University of Kansas, Indiana University, and

Pennsylvania State University.

### **National Science Foundation fellow**

Derrick T. Jones, a 2012 AaA REU participant, is a 2016 recipient of the National Science Foundation Graduate Research Fellowships. He was among 2,000 National Science Foundation fellows selected this year from nearly 17,000 applicants. Derrick Jones will receive three years of financial support, including a \$34,000 annual stipend and \$12,000 annual cost-of-education allowance. Additionally, he is being provided access to NSF's Enhanced Cyber-Infrastructure via Extreme Sciences and Engineering Discovery Environment (XSEDE) and also are eligible for funding from the foundation's GROW and GRIP programs. Derrick is now a PhD student at Mississippi State University. During his doctoral studies at MSU, Jones is engaged in applied mathematics research.

### **NASA MUREP Scholarship**

AaA REU student Jefferson Ridgeway attended the North Carolina GIS Conference: Mobile and Global in Raleigh, NC on Thursday, February 26, 2015. He presented the Update of the CERSER TeraScan Cataloguing System and TeraScan Image Processing Scripts. His oral presentation was followed by a question and answer session from the audience. On Friday, February 27, 2015, he received a monetary award for being one of the undergraduate presenters at this conference in Raleigh. Jefferson is also a 2015 recipient of the NASA MUREP Scholarship. Selected undergraduate students receive 75% of their tuition and education related cost up to \$9,000 per academic year via a NASA training grant. Students are required to participate in summer internship during the summer of scholarship award period. The scholars receive a \$6,000 stipend for their participation.

### **What is the impact on other disciplines?**

The program also includes a Research Experience for Teachers (RET) component, which involves pre-service STEM education majors. The Research Experience for Teachers (RET) provides opportunities for pre-service STEM teachers to participate in the AaA=RET program. This component is housed at ECSU and KU. RET interns are assigned to specifically designed research teams led by members of the CReSIS Education staff. RET team members are undergraduate students with a major in STEM education.

### **What is the impact on the development of human resources?**

The evaluation results suggest that the CReSIS REU/RET program has provided such a valuable experience that students have significantly improved their research skills, have largely increased their confidence in conducting research and have successfully encouraged them to consider attending graduate school. The effect size analysis confirmed that this program had a positive and large effect on students' three primary outcomes: research skills, confidence in conducting research and STEM career aspirations. It is worth noting that in addition to these three expected goals, this year's REU program has enabled students to form friendships with their peers, has allowed students to form close connections with faculty members and also has encouraged students to persist in their STEM studies. In terms of research experience satisfaction, 2015 REU/RET students were largely more satisfied with this research experience and with various achievements they gained through this experience than 2014 REU/RET students. From mentors' perspectives, they suggested that the REU/RET program had a positive impact not only on students' research but also on attitudes toward their careers in STEM fields. A copy of the evaluators report is attached.

## Demographics

There were a large percentage of minority and underrepresented students participating in the program, with 55% of female students and 80% of minority students (African American, and Native American students). Also, 44% of the participants (9 out of 20 students) who provided information regarding their socio-economic status shared they were from single-parent households with an annual income of less than \$45,000.

Table 1: 2015 CReSIS REU Demographic Profiles (Gender)

| 2015 REU | Number | Percent |
|----------|--------|---------|
| Female   | 11     | 55%     |
| Male     | 9      | 45%     |
| Total    | 20     | 100.00% |

Table 2: 2015 CReSIS REU Demographic Profiles (Race)

| 2015 REU        | Number | Percent |
|-----------------|--------|---------|
| White           | 3      | 15%     |
| Black           | 16     | 80%     |
| Native American | 1      | 5%      |
| Total           | 20     | 100%    |

### 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.

## **Changes/Problems**

### **Changes in approach and reason for change**

The program is currently operating under a one year no cost extension through summer 2017. Remaining funds will be used to operate an abbreviated program during summer 2016. The staff plans to submit a new proposal to the next REU solicitation.

### **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.

## **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.

