

# DEVELOPING YOUR AUTHENTIC GEOSPATIAL SPARK: CHALLENGES. APPLICATIONS. OPPORTUNITIES.



Terra McKee, 3<sup>rd</sup> Year PhD Student  
Women In STEM – AAUW Presentation  
2/25/23



NORTH CAROLINA AGRICULTURAL  
AND TECHNICAL STATE UNIVERSITY

"Treasure your curiosity and  
nurture your imagination.  
Have confidence in yourself.  
Do not let others put limits on  
you. Dare to imagine the  
unimaginable."

Shirley Ann Jackson  
Physicist

I  
N  
S  
T  
R  
U  
C  
T  
O  
R



**Ms. Terra McKee**

BS in Geography  
MS in Earth Science  
PhD Student at NCAT



*There is one thing you have got to learn about our movement. Three people are better than no people - Fannie Lou Hamer*



"Treasure your curiosity and nurture your imagination. Have confidence in yourself. Do not let others put limits on you. Dare to imagine the unimaginable."

*Shirley Ann Jackson*  
Physicist

#GIS AND DRONES

## THE PURPOSE

Increasing the number of geospatial scientists in the US workforce

- Summer Program
- Including Partnerships
- Engaging Parents
- Self Improvement
- Applying What I Have Learned



## K-12 POSITIVE VIEW OF SCIENCE

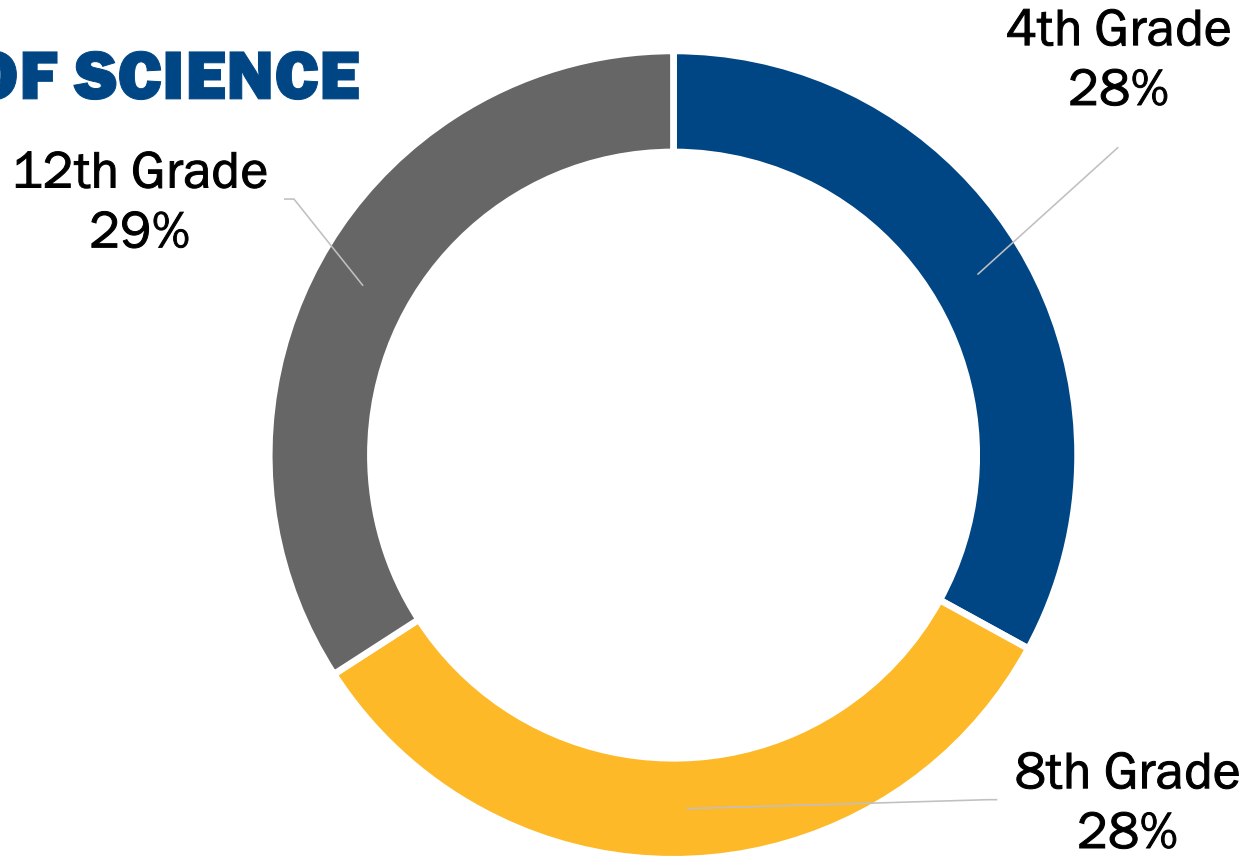
A National Assessment of Education Progress (NAEP) report (2015) asked American students if they had a positive view of science. What were the results?

### Private School Students

4<sup>th</sup> Grade = 29%

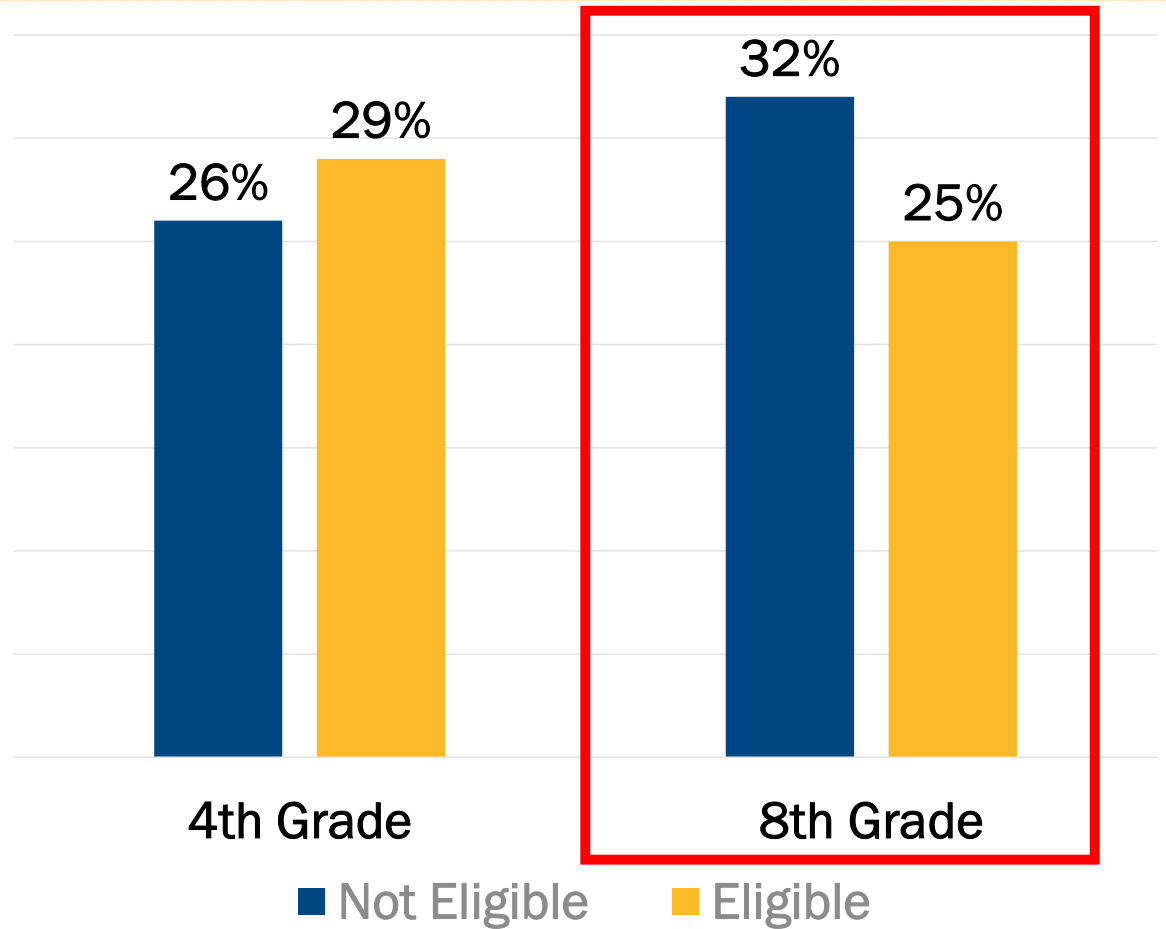
8<sup>th</sup> Grade = 32%

12<sup>th</sup> Grade = 34%



## K-12 FREE LUNCH VS NO FREE LUNCH

In the same study, a comparison between students eligible for free lunch and not eligible for free lunch showed interesting results



## RESEARCH SUPPORT

*“Diversity, household size, and multigenerational households have negative impacts on students’ SAT scores” (Chew, Satpathy, Wong)*

Geospatial education is often not taught or taught alongside other subjects (Osborne, Van De Gevel, Eck & Sugg)

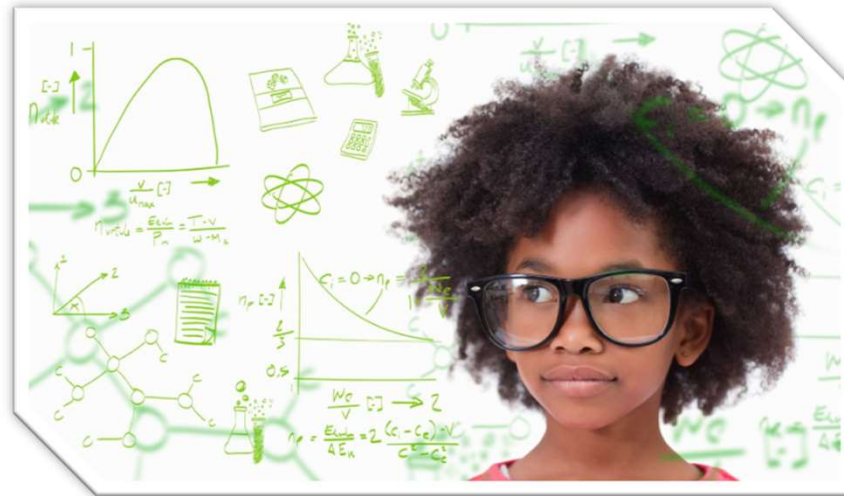


<https://www.the74million.org/article/the-power-of-one-new-research-shows-black-students-see-big-benefits-from-a-single-black-teacher/>

## LEARNING EXPERIENCES

This issue is CRITICAL because K-12 learning experiences SHAPE student academic backgrounds

- \* Knowledge
- \* Understanding
- \* Attitudes
- \* Identities
- \* Confidence



<http://www.vctm.org/The-Invisibility-of-Black-Girls-in-Mathematics>



## K-12 LEARNING ENVIRONMENTS

Do not uniformly help students make sense of real-world phenomena

Do not connect students to the phenomena in their environments



<https://www.nationalacademies.org/news/2018/11/investigation-and-design-can-improve-student-learning-in-science-and-engineering-changes-to-instructional-approaches-will-require-significant-effort>

## GAPS IN THE K-12 PIPELINE

Major research findings suggest several factors that may prevent students from succeeding in STEM programs

Students struggled with transitioning from memorizing information to applying information

78% of students were frustrated with poor curriculum design and unaligned assessments

Early academic tracking contributes to inadequate preparation

<https://www.springer.com/gp/book/9783030253035>

## ACADEMIC GATEWAYS

Therefore, K-12 earning environments ARE academic gateways.

Understanding these variabilities are critical for education beyond classrooms. Intentional efforts to address the known and emerging variabilities.

**52% who enter STEM do not finish**



<https://www.giscorps.org/project-types/k-12-missions/>

## MOTIVATIONAL QUOTE

**No One Can Stop Opportunity!**  
(NCAT Webinar Speaker)

# GEOSPATIAL APPLICATIONS

AGG  
IES DO



NORTH CAROLINA AGRICULTURAL  
AND TECHNICAL STATE UNIVERSITY

## GEOSPATIAL CAREER EXPERIENCES

Econometric Modeler

Crime Data Analyst

GIS Analyst

Well Installer

GIS Technician

GIS Instructor

Earth Science Educator

Technology Training Specialist

Community Needs Assessment Leader

GIS Business Researcher

Fire Data Analyst

GIS Specialist

Data Scientist

Secretary

PhD Student

Earth Science Lab Instructor

Ethnographer

Health Geographer

Research Assistant

GIS Librarian

## GEOSPATIAL CAREER INSIGHTS

[Data Analytics Student Trainee](#) – National Science Foundation

Lead and Collaborator for Improving In-House Data Analytic Tools. Reporting. Working Across Divisions

[Fire GIS Analyst](#) – City of High Point

Federal, State, and Local Data Reporting. Logistics for Engine Response. Maps for Building Inspections

[Econometric Modeling Intern](#) – Environmental Protection Agency

SAS programmer. Novice to Expert. Professional Networking. Mentor and Additional Career Opportunities

[GIS Instructor](#) – North Carolina Central University

Departmental Gopher. Hands-On Labs to Computer Software Installations. Recruitment. Tutoring. Mentor

[Technology Training Assistant](#) – Welfare Reform Liaison Project, Inc.

Trained Low-Income Adults for Technology Careers. Revamped Training Plan. Aligned w/ Funder Requests

# BLACK AMERICANS IN RURAL COMMUNITIES: HEALTH VULNERABILITIES AND GEOSPATIAL INFLUENCES

AGG  
IES DO

Ms. Terra McKee

November 29, 2022

Applied Science and Technology

Preliminary Exam Defense

[tlmckee@aggies.ncat.edu](mailto:tlmckee@aggies.ncat.edu)



NORTH CAROLINA AGRICULTURAL  
AND TECHNICAL STATE UNIVERSITY



## Health Geography

# PREVENTING CHRONIC DISEASE

PUBLIC HEALTH RESEARCH, PRACTICE, AND POLICY

VOLUME 4: NO. 4

OCTOBER 2007

TOOLS AND TECHNIQUES

## Expanding the Obesity Research Paradigm to Reach African American Communities

Shiriki K. Kumanyika, PhD, MPH, Melicia C. Whitt-Glover, PhD, Tiffany L. Gary, PhD, T. Elaine Prewitt, DrPH, Angela M. Odoms-Young, PhD, Joanne Banks-Wallace, RN, PhD, Bettina M. Beech, DrPH, MPH, Chanita Hughes Halbert, PhD, Njeri Karanja, PhD, Kristie J. Lancaster, PhD, RD, Carmen D. Samuel-Hodge, PhD

# Geospatial Vulnerabilities and Health

## IAPHS Workshop: Spatial Techniques for Population Health & Health Equity Research

GIS and spatial methods tutorial

Byoungjun Kim, PhD, MUP

New York University Grossman School of Medicine

## EMERGING METHODOLOGIES FOR SPATIAL EPIDEMIOLOGY: MEASURING PERSONALIZED EXPOSURE TO THE EXPOSOME

PETER JAMES, ScD  
ASSOCIATE PROFESSOR OF POPULATION MEDICINE  
DEPARTMENT OF POPULATION MEDICINE  
HARVARD MEDICAL SCHOOL AND HARVARD PILGRIM HEALTH CARE INSTITUTE

ASSOCIATE PROFESSOR  
DEPARTMENT OF ENVIRONMENTAL HEALTH  
HARVARD TH CHAN SCHOOL OF PUBLIC HEALTH

IAPHS WORKSHOP ON SPATIAL TECHNIQUES FOR  
POPULATION HEALTH & HEALTH EQUITY RESEARCH

## An Intro to Spatial Data & ESDA

October 12, 2022

Marynia Kolak, PhD, MFA, MS  
Assistant Professor @Dept of Geography & GIScience  
PI @Healthy Regions & Policies Lab



### HHS Public Access

Author manuscript

*Soc Sci Med.* Author manuscript; available in PMC 2017 November 01.

Published in final edited form as:

*Soc Sci Med.* 2016 November ; 168: 16–29. doi:10.1016/j.socscimed.2016.08.047.

### Research on Neighborhood Effects on Health in the United States: A Systematic Review of Study Characteristics

### THEORY AND METHODS

A brief conceptual tutorial on multilevel analysis in social epidemiology: investigating contextual phenomena in different groups of people

Juan Merlo, Min Yang, Basile Chaix, John Lynch, Lennart Råstam

## GEOSPATIAL CAREER RESOURCES

### [ESRI – Environmental Systems Research Institute](#)

Key Organization for GIS Training and Research

### [ESRI GIS Lessons](#)

GIS Lessons for Class Projects Or Individual Fun. Cloudbursts (Took me 10-15 hours )

### [Geospatial Technology Competency Model](#)

Find Out What Skills You Need or What Fits Your Interests

### [American Association of Geographers \(AAG\)](#)

Key Geography Organization

### [QGIS](#)

Open Source / Free GIS Mapping. ESRI Has Quirks

## STUDENT AND ADULT RESOURCES

### [The National Academies of Sciences, Engineering, and Medicine](#)

Research Recommendations and Reports from Our Nation's Best Researchers

### [Walden University](#)

Research Templates (APA Format).

### [LinkedIn Learning](#)

Beginner to Advanced Training – Technical and Career

### [Coursera](#)

Training from Big Data to Clerical from Universities.

### [USAJOBS – Federal Employment](#)

Researcher. Media. English. Data Analysis. Program Management. Clerical. Film. Event Planning.

## WHY FLEXIBILITY MATTERS

In the US, 82% of organizations are expected to have one or more positions that require skills in data analytics.

In geospatial science, positions will use and analyze data a minimum of 88% of the time.



<https://www.onetonline.org/link/summary/15-1199.04>

# GEOSPATIAL OPPORTUNITIES

AGG  
IES DO

## I AM GROWING

- I use a variety of tools
- I work with a variety of people
- I am training
- I am teaching myself
- I am interested in business
- I am volunteering
- I am exploring and listening to different fields



"Treasure your curiosity and  
nurture your imagination.  
Have confidence in yourself.  
Do not let others put limits on  
you. Dare to imagine the  
unimaginable."

Shirley Ann Jackson  
Physicist



## SUMMER OPPORTUNITIES

Free Cyber Camp (NCAT – Greensboro, NC)

<https://www.ncat.edu/news/2019/05/coe-cybersecurity-camp.php>

Wake Forest University Summer Immersion (Full Scholarships Offered. Winston-Salem, NC)

<https://immersion.summer.wfu.edu/>

Shadowing / Volunteer (5/10 hours per week)

Onet (Career and Salary Information)

<https://www.onetonline.org/>

## KEY SOURCES

Science and Engineering for Grades 6-12: Investigation and Design at the Center

<https://www.nap.edu/catalog/25216/science-and-engineering-for-grades-6-12-investigation-and-design>

Talking about Leaving Revisited: Why we are still Talking about Leaving

<https://seachange.aaas.org/events/2020/6/9/talking-about-leaving-revisited-why-we-are-still-talking-about-leaving>

Indicators for Monitoring Undergraduate STEM Education

<https://www.nap.edu/read/24943/chapter/8>

Building Capacity for Teaching Engineering in K-12 Education

<https://www.nap.edu/catalog/25612/building-capacity-for-teaching-engineering-in-k-12-education>

## KEY SOURCES

Geospatial Technology Competency Model

<https://www.careeronestop.org/CompetencyModel/competency-models/geospatial-technology.aspx>

Federal Geographic Data Committee

<https://www.fgdc.gov/topics/geospatial-education-and-workforce-development>

National Survey of Mathematics and Science Education

[http://horizon-research.com/NSSME/wp-content/uploads/2020/04/Report\\_of\\_the\\_2018\\_NSSME.pdf](http://horizon-research.com/NSSME/wp-content/uploads/2020/04/Report_of_the_2018_NSSME.pdf)

# DEVELOPING YOUR AUTHENTIC GEOSPATIAL SPARK: CHALLENGES. APPLICATIONS. OPPORTUNITIES.



Terra McKee, 3<sup>rd</sup> Year PhD Student  
Women In STEM – AAUW Presentation  
2/25/23



NORTH CAROLINA AGRICULTURAL  
AND TECHNICAL STATE UNIVERSITY