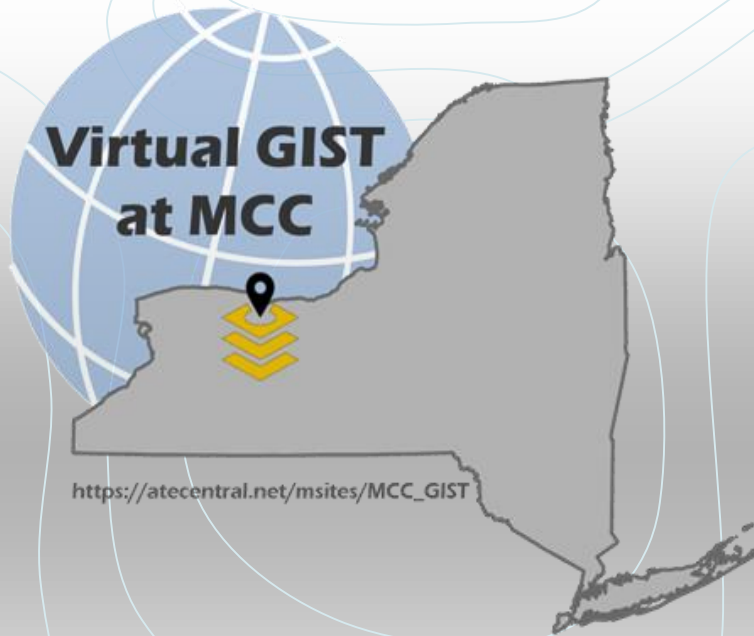




Monroe
Community
College
STATE UNIVERSITY
OF NEW YORK

Geography & GIST Program (Geospatial Information Science Technology)



Geography



The *Meeting Workforce Needs for Skilled Geospatial Technicians through Virtual Geospatial Information Science Technology Education* project was funded through the U.S. National Science Foundation (NSF) Office of Advanced Technological Education under Grants Award # 1955256 to Monroe Community College. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

What is Geography?

Scientific study of “anything” over space and time.

- Physical



- Human



- Regional

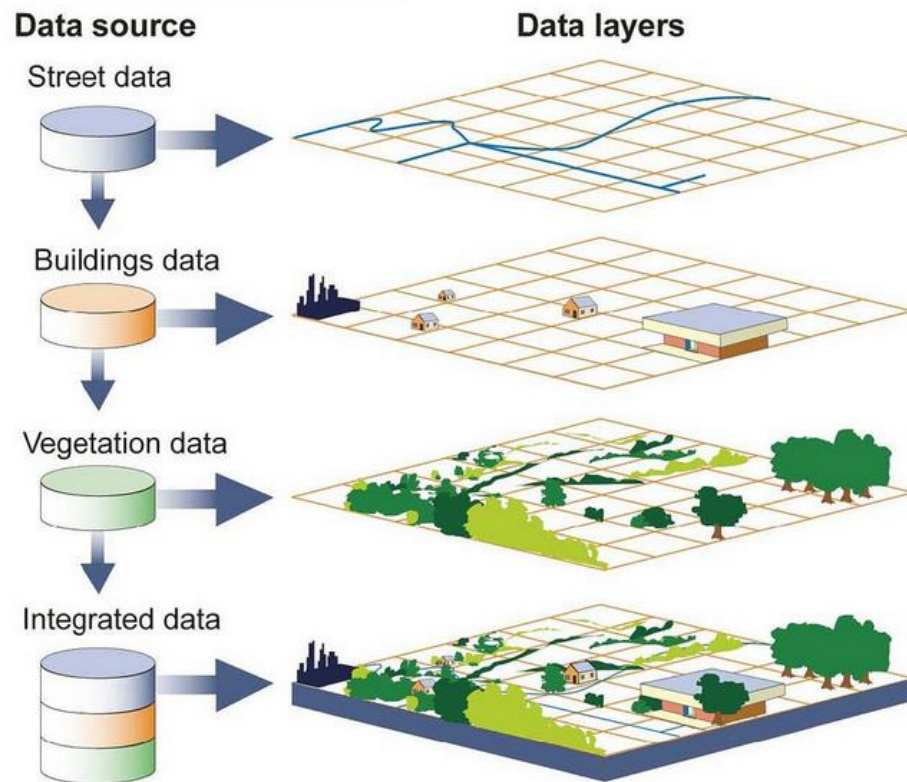


- Geospatial technology



What is Geospatial Technology?

Integration of Geographical Information Systems, Remote Sensing, and GPS.



What is Geospatial Technology?

Mapping the COVID 19 Pandemic



Video from the Geospatial Revolution

<https://www.youtube.com/watch?v=rWZ1M7Z2Jho>

MCC's Geospatial program

Stackable program – Earn all 3 in the A.A.S. in GIST

A.A.S. in GIST [LINK](#)

24 credit GIST Certificate [LINK](#)

9-credit micro-credential for advanced users [LINK](#)

Or, earn these 2 together:

24 Credit GIST Certificate

A.S. Geography concentration in GIST [LINK](#)

Geospatial Information Science and Technology (Gist)

● Certificate [Department of Chemistry and Geosciences](#)

GET THE “G.I.S.T.” ON THE
GROWING FIELD OF GEOSPATIAL
INFORMATION SCIENCE AND
TECHNOLOGY

Geospatial Information Science and Technology (G.I.S.T.) is used virtually everywhere. It converts remote sensing information provided by satellites and imagery into digital data.

[Start My Application >](#)

[Explore Careers >](#)

[School of Science,
Technology, Engineering &
Math \(STEM\)](#)



2018-2028 GIST Job Outlook

Geospatial Information Scientists & Technologists:

Employment: 413,000

Projected Growth: Faster than avg, 7-10%

Median Wages: \$88,550

Geographic Information Systems Technicians:

Employment: 412,800

Projected Growth: Faster than avg 7-10%

Median Wages: \$88,550

Cartographers and Photogrammetrists:

Employment: 11,800

Projected Growth: Much faster than avg, 11%+

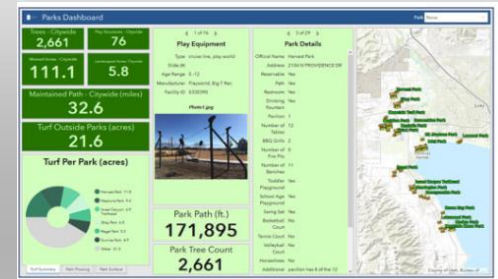
Median Wages: \$65,470

Remote Sensing Technicians:

Employment: 72,400

Projected Growth: Faster than avg, 7-10%

Median Wages: \$50,550



Source: Bureau of Labor Statistics. Employment figures are for 2018; projected growth is for the period 2018-2028; median wages are for 2019.

AAS in Geospatial Information Science & Technology (GIST) LINK

Table 1

FALL Year 1	Cr	SPRING Year 1	Cr
Introduction to GIST	3	<i>Web Mapping</i>	3
Cartography	3	Spatial Analysis	3
English	3	Art/Foreign Language	3
Introduction to Remote Sensing	3	Physical Geography Lab	1
Math	3	Physical Geography	3
		Physical/Health Education	2
FALL Year 2	Cr	SPRING Year 2	Cr
<i>Geospatial Data Acquisition and Management</i>	3	<i>Introduction to Programming for GIS</i>	3
Statistics	3	Capstone Course in Geospatial Technology	2
Elective	3	American History	3
Human Geography	3	Program Elective	3
Elective	3	Elective	3
		Elective	3

← Micro-credential

← Micro-credential

Micro-credential →



Alumni Mentoring



Four alumni are providing support to our current students!



Sample Virtual Internships/Partnerships

- American Red Cross
- New York State Department of Environmental Conservation
- NY State Department of Health
- Water for South Sudan
- National GeoTech Center of Excellence
- Genesee Land Trust

Maya

Description

- This map shows the old and new paths of the Erie Canal in a Vintage Style
- This map also shows some of the

Evah_Valenti_GEG239_Spring2020.mp4
▷ 8:13 ⌂ Jun 11

Researching the Survey

- In this part of my oration to talk that gave the most trouble... in order to find out how to work properly!
- I had to spend 1.5 hours to get the survey to work properly.
- Next part to go is the survey.

Michael_Andrus_GEG239_Spring2020.mp4
▷ 12:47 ⌂ Jun 11

GIS Training Tour

Feature Layers and Creating Maps

Peter_Bowman_GEG239_Spring2020.mp4
▷ 9:59 ⌂ Jun 11

Derrick_Neidig_GEG239_Spring2020.mp4
▷ 14:18 ⌂ Jun 11

Kazakh Soil and Steppe Types

Salvatore_John_Ragusa_GEG239_Spring2020.mp4
▷ 22:34 ⌂ Jun 12

Data and Methods

Date:

- Sentinel-2 Imagery from 2015 and 2020
- ASTER Level 1T Imagery from 2000 and 2019
- Landsat 5 Imagery from 1980 and 2000
- Shapefiles from Humanterrain Data Exchange

Methods:

- Temporal spatial analysis of mangroves (compare and assess changes over multiple years)
- Correlation Matrix tool, Euclid to Rasterize tool, band combination analysis, Get Cell Values tool to create spectral signature graphs

Catherine_DuBreck_GEG239_Spring2020.mp4
▷ 14:31 ⌂ Jun 12

The Darkness Below the Canopy

- Better growth in meadows or forested areas?
- Traditionally poor growth below the dark canopy.

Alex_Tedrow_GEG239_Spring2020.mp4
▷ 11:59 ⌂ Jun 12

Supervised Classification

- Training polygons, view histograms
- Create signature file
- Maximum Probability Classification
- Reclassify data

Colin_Dahlberg_GEG239_Spring2020.mp4
▷ 12:24 ⌂ Jun 12

THE PROBLEM

- The problem was that this was too complex of a problem for me to solve within the given time period
- When I was drafting out the program, knowledge had to be built up
- Some of the issues being the program and other related solutions, such as the program that would help with the specific problem.

Michael_Coughlin_GEG239_Spring2020.mp4
▷ 12:30 ⌂ Jun 12

Survey123 for ArcGIS

Maggie>Weisenel_GEG239_Spring2020.mp4
▷ 8:21 ⌂ Jun 12

Global Virtual GIST Internships

Current

- Malawi: Cornell University and partner in Malawi
- Mexico: Universidad Autónoma de San Luis Potosí
- Kazakhstan: Kazakh State Agrotechnical University

Past

- Colombia: Fundación Universitaria Tecnológico Comfenalco
- Costa Rica: Monteverdi Institute



Geospatial Interns & GIST Employment

Monroe County



NY State



National and International



Soils, Food and Healthy Communities



The development of this document was made possible by the *Meeting Workforce Needs for Skilled Geospatial Technicians through Virtual Geospatial Information Science Technology Education* project, with funding from the National Science Foundation (DUE 1955256). Available for educational use only. Created 2021.

Sample Work

Secrets in the Soil: An NDVI Analysis of the Archaeological site at Gerace

By Jonathan Brooks
GEO 133

Introduction

The Roman Villa at Gerace has yielded a plethora of archaeological remains, yet these are still considered mere fragments waiting to be excavated and understood. However, knowing exactly where to start digging can be a difficult task. Fortunately, advancements in remote sensing technology offer a solution to the problem and may help archaeologists progress archaeological sites with greater accuracy. Remote Sensing (RS) is the use of satellite or aerial photography to observe the earth's surface and especially interesting areas to test the ability of NDVI analysis.

Discussion

The findings from this study may not provide an answer but it certainly offers a way (NDVI) for archaeological work in a promising investment. A study that identifies areas of soil moisture from a plant color index can facilitate more accurate mapping of the site to possible stone construction systems (see Appendix).

Quantities and Goals

NDVI (Normalized Difference Vegetation Index) data analysis provides a method to reveal buildings and other archaeological features buried underground. The remote sensing method determines vegetation health by detecting the amount of near infrared (NIR) light they reflect. Vegetation reflects near infrared light and absorbs it, while non-vegetation reflects both. NDVI is used to compare the NDVI of LANDSAT imagery of the site of Gerace to that of the location of buildings and archaeological features hidden underground.

Conclusions

The findings from this study may not provide an answer but it certainly offers a way (NDVI) for archaeological work in a promising investment. A study that identifies areas of soil moisture from a plant color index can facilitate more accurate mapping of the site to possible stone construction systems (see Appendix).

References

Brooks, Jonathan. "The Villa and Agricultural Economy of San Basilio Park: an Archaeological Project of the University of Calabria." *Journal of Archaeological Science*. 2017. <https://doi.org/10.1016/j.jas.2017.05.011>

CEG133 - Created for Fall 2019 Portfolio

NATION TOTALS (2019):

CAN	473
USA	308
SWE	108
FIN	96
RUS/CZE/EE	50
CHE	13
DEU	9
SNG	8
AUT	5
FRA	4
SVK	4
HRV	3
DNK	3
ITA	3
GBR	2
USA	2
SVN	2
UKR	2
UK	1

Nationalities of the NATIONAL HOCKEY LEAGUE

US-Born NHL Players by State

2017-18 Season: Nathan Walker became the first ever player to play in the NHL.

Sources: Natural Earth Data, Hockey-Reference.com, NHL.com, Wikipedia

The Intensification of California Wildfires

Peter Fowler
GEO 133 (Intro to Remote Sensing)

Introduction

Wildfires have become a major threat to the western United States, with California being particularly affected. The frequency and intensity of these fires have increased significantly in recent years, leading to substantial loss of life and property. This study aims to analyze the intensification of California wildfires using remote sensing data.

Results

The analysis shows a clear trend of increasing wildfire intensity and frequency over the past decade. The data indicates that the area affected by wildfires has expanded significantly, particularly in the central and southern regions of California.

Project Problem Statement

The goal of this project is to identify the factors contributing to the intensification of California wildfires and to provide recommendations for fire management and prevention strategies.

Discussion

The findings suggest that a combination of factors, including climate change, land use changes, and human activities, are contributing to the intensification of wildfires. The data shows that the frequency and intensity of fires have increased significantly in recent years.

Conclusions

The intensification of California wildfires is a significant and concerning trend that requires immediate attention. The data shows that the frequency and intensity of fires have increased significantly in recent years.

References

California Department of Forestry and Fire Protection. (2018). *California Wildfire Statistics*. Sacramento, CA: California Department of Forestry and Fire Protection.

PLAN YOUR VACATION WITHOUT FEAR!

RED, WHITE AND BLOOD

Cryptids of the Continental United States

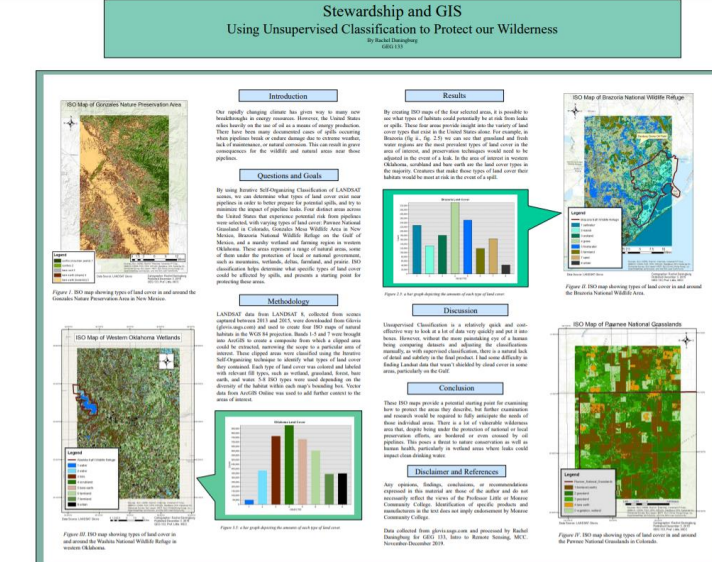
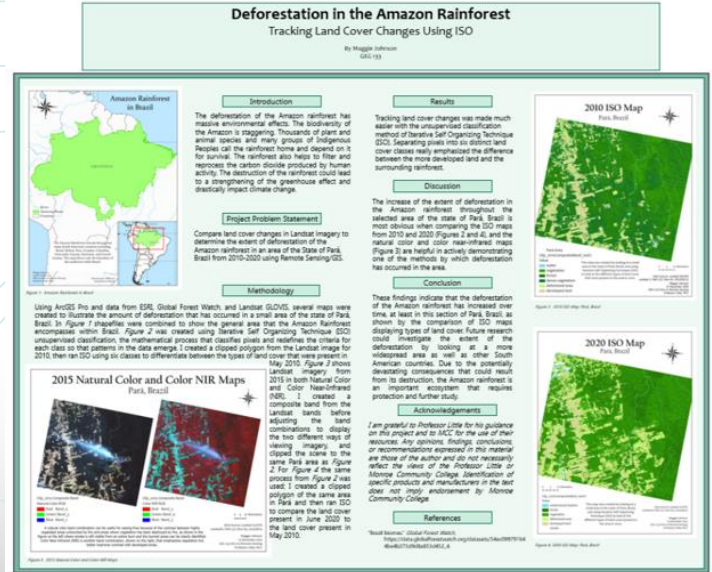
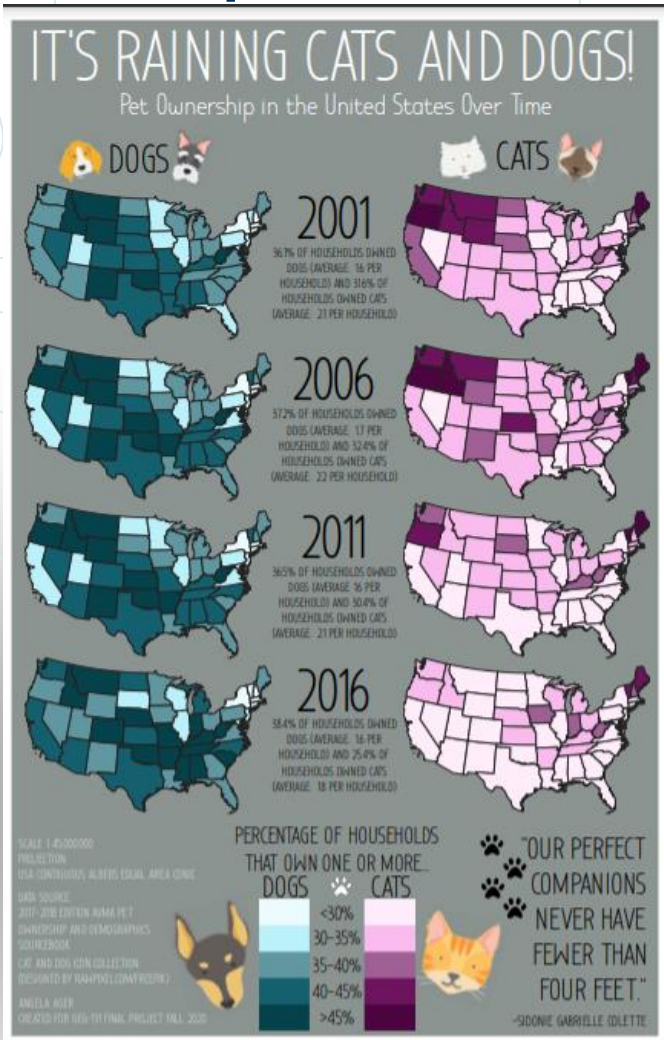
Traveling far from home is exciting, but nothing is more scary than a monster out of sight! Looking for his job to catch some fish without bringing home a big monster! For the modern traveler, a vacation away is meant to be fun and invigorating. Far from the hustle and bustle of the 21st Century, nature is meant to calm us, help us come out of ourselves and return to nature. However, with our vacations, getting killed by monsters is no longer a daily occurrence for us. With the assistance of this map, it may never happen.

Many species exist regarding North American cryptids. Considering the current seasonal crisis, we look solely to the hidden creatures of the continental United States. The worst enemy of these cryptids are you for the faint of heart. Some are deadly, but not all are malicious. Each cryptid has been listed on a scale from 1 to 5 based on aggressive behavior and how physically dangerous it is. Some monsters, while benign, may still cause extreme harm simply due to size or physical form—many paleontologists fit these criteria. Others, such as the Mordoran, are certainly aggressive but offer little damage. The worst—both the Great Horror of Maryland and the Madog of Wisconsin rank a 5 in both categories, attacking and killing humans without provocation.

Maryland itself is home to at least three famous beasts. Perhaps the fiercest would be a rather innocuous animal of the Chesapeake Bay: 'The Mordoran and the northern border states may soon easily claim to have the wilder year of the forest cryptids to roam the earth, certain from the Northwest to the Great Lakes, venturing up into a Canadian province. We will allow you to make the final choice. Remember, while these are some of the more famous hidden animals, there are more certainly out there. A few have only been spotted in rare locations. Others may

Project: North America's Most Dangerous Cryptid Area Chart.
Data: Natural Earth, Bureau of Land Management, Atlas Obscura.

Sample Work



Video (scroll down, start at 5:55): <https://www.monroecc.edu/academics/majors-programs/majors-programs/stem/geospatial-information-science-and-technology-associate-of-applied-science/>

MCC's Geography program

A.S. in Geography w/ four tracks [LINK](#)

- Human
- Physical
- Regional
- Geospatial

Geography



Or, earn these 2 together:

24 Credit GIST Certificate

A.S. Geography concentration in GIST

AS in Geography, human track

Distribution Requirements	Credit Hours
GEOGRAPHY: HUMAN GEOGRAPHY TRACK	
FIRST SEMESTER	
ENG 101 College Composition OR ENG 200 Advanced Composition	3
MTH 160 Statistics I OR MTH 162 Statistics for the Social Sciences OR MTH 165 College Algebra OR higher***	3-4
GEG 100 Physical Geography I Laboratory	1
GEG 101 Physical Geography I	3
GEG 102 Human Geography	3
MCC GENERAL EDUCATION - HEALTH AND WELLNESS (MCC-HW) ELECTIVE	2
First Semester Total:	15-16
SECOND SEMESTER	
GEG 130 Digital Earth	3
GEG 200 World Regional Geography	3
SUNY GENERAL EDUCATION - HUMANITIES (SUNY-H) ELECTIVE**	3
OPEN ELECTIVE#	3-4
OPEN ELECTIVE#	3
Second Semester Total:	15-16

THIRD SEMESTER	
GEG 211 Economic Geography	3
GEG 131 Cartography OR SUNY GENERAL EDUCATION - THE ARTS (SUNY-A) ELECTIVE	3
OPEN ELECTIVE#	3
PROGRAM ELECTIVE*	3
PROGRAM ELECTIVE*	3-4
Third Semester Total:	15-16
FOURTH SEMESTER	
GEG 220 Geography of Genocide	3
OPEN ELECTIVE#	3-4
OPEN ELECTIVE#	3
PROGRAM ELECTIVE*	3
PROGRAM ELECTIVE*	3
Fourth Semester Total:	15-16
TOTAL CREDITS:	60-64

Other tracks available:

<https://www.monroecc.edu/academics/majors-programs/stem/geography-associate-degree/>

Transfer Opportunities for AS Geography & AAS in GIST

Geography

AS - Transfer Program [Department of Chemistry and Geosciences](#)

50% or more of this program can be completed online.

DESIGNED FOR SEAMLESS TRANSFER TO SUNY FOUR-YEAR DEGREES

SUNY four-year degree options include General and Environmental Geography, Earth System Science, Urban and Regional Planning, Geographic Information Systems Technology (G.I.S.T.)—and more. Transfer your MCC credits to bachelor's degree programs at colleges and universities—nearby and across the country.

- SUNY
University at Buffalo
New Paltz
University at Albany
Geneseo
Binghamton
Oneonta
- University of Colorado Boulder
- Penn State University
- University of California Santa Barbara

Geospatial Information Science Technology

AAS - Career Program [Department of Chemistry and Geosciences](#)

100% of this program can be completed online.

Our graduates find promising career and internship opportunities at organizations like these:

- American Red Cross
- Con Edison (NYC)
- EagleView
- Esri
- Genesee Land Trust
- MRB Group
- New York State Department of Health
- Oswego County
- Soil, Food and Healthy Communities (Malawi)/Cornell University
- Town of Penfield
- Water for South Sudan

OPEN THE DOOR TO FUTURE STUDIES.

MCC's G.I.S.T. A.A.S degree not only puts you in demand with employers, it gives you a strong foundation for transfer into bachelor's degree programs at excellent institutions like these:

- University at Buffalo
- Rochester Institute of Technology
- SUNY Farmingdale
- SUNY Cortland

Student Opportunities

- MCC Mapping Club events – 400 attended in the fall!
- Paid internships
- For credit internships



Student Opportunities

- Mount Hope Field Trips
- Holocaust, Genocide, and Human Rights Project



Thank you! Questions?

Michael Boester: Professor of Geography, Endowed Chair of Holocaust, Genocide, and Human Rights Project

Jonathon Little: Associate Professor of Geography/GIST and NSF ATE Principal Investigator

Heather Pierce: Assistant Professor of Geography/GIST and co-PI NSF ATE

MCC GIST program web site: <https://www.monroecc.edu/depts/geography/>

Questions: Little jlittle@monroecc.edu; Boester mboester@monroecc.edu; Pierce hpierce@monroecc.edu

Geography & GIST

Field Trips to
Mt. Hope Cemetery



Field Work in Colombia



Conferences



Drone flights



Mapping Club Mapathons