

Geospatial Technology: New Micro-credential and Hands-on GIS Exercise

Jonathon Little: Associate Professor of Geography/GIS

In chat, your intro

- Name and current location*
- What is your favorite map, or the last time you made a map, or your dream country to visit.*



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.



Welcome and Introductions

Jonathon Little: Associate Professor of Geography/GIS

Thanks to

Jian Qin: Syracuse University Library Information Science

Lisette Child: School of Information Studies

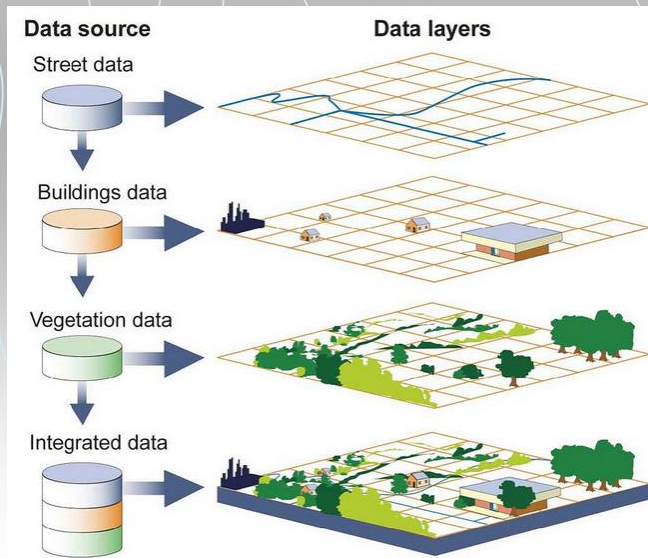
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Welcome and Introductions

Your “chat” intro...

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Q: What is geospatial technology?



What is Geospatial Technology?

**GEOSPATIAL
REVOLUTION**

WPSU
PENN STATE

Geospatial tech =
Integration of GIS,
remote sensing,
and GPS.



Episode 1

Episode 2

Episode 3

Episode 4

Trailer

Geospatial Revolution Trailer

<https://www.youtube.com/watch?v=ZdQjc30YPOk>

MCC's Geography/GIST program

Current:

24 Credit GIST Certificate

A.S. Geography concentration in GIST

9 (or 12) credit micro-credential for GIST professionals

Future:

A.A.S. in GIST

Geography



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.

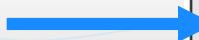
[Start My Application >](#)

[Explore Careers >](#)

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

Take Intro GIS or Earn a GIST Certificate Information

Or, try GEG 130 this summer online,



Distribution Requirements	Credit Hours
FALL SEMESTER: 13 CREDIT HOURS	
GEG 100 Physical Geography I Laboratory	1
GEG 101 Physical Geography I	3
GEG 130 Digital Earth	3
GEG 131 Cartography	3
GEG 133 Introduction to Remote Sensing	3
Total	13
SPRING SEMESTER: 11-12 CREDIT HOURS	
GEG 102 Human Geography	3
GEG 230 Spatial Analysis and GIS	3
GEG 239 Capstone in Geospatial Technology	2
PROGRAM ELECTIVE*	3-4
Total	11-12
TOTAL CREDITS	24-25

Jonathon Little jlittle@monroecc.edu
MCC GIST Certificate Program

Professional GIST micro-credential

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>UAS 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

Or, try GEG 130 this summer online.

Or GEG 133 (remote Sensing)

Micro-credential, GEG 236

Micro-credential, GEG 237

Micro-credential, GEG 238

Interested? Email as may be able to change prereq for 236

Fall 2021

Geospatial Data Acquisition and Management

GEG 236 (3 credit hours) - Part of the series (GEG 236, 237, 238) and A.A.S. in GIST (awaiting SUNY approval)



This course addresses the interpretation and understanding of a variety of data formats used by geospatial professionals. It introduces the fundamental concepts such as primary Geospatial Information Science (GIS) data creation, geodatabase design and creation, data management, and discusses quantitative techniques for the collection, classification, integration, and management of geographical data. Advanced topics include: UAS data collection and processing, mobile data collection, automation using Python and enterprise geodatabases. Students will be guided through a series of lectures hands-on computer-based exercises, and an end of semester project.

Prerequisites: Introduction to Remote Sensing (GEG 133) or permission of the instructor.



Students in this course:

- Learn important geospatial data management skills that are in high demand!
- Learn the fundamentals of UAS (drone) training, safety, mission and flight planning.
- Develop skills in UAS data collection and processing.
- Learn advanced skills in mobile data collection.
- Interact in a multi-user environment using postGIS.

Topics covered:

- Data models, data formats and data management
- Best practices for data collection and processing
- Database management systems and schema
- Advanced geodatabase design
- Topology
- Enterprise geodatabase design
- Using QGIS in a multiuser, postGIS environment
- Introduction to Python automation



Day/Time:

Weds. 5:30 to 9:11 PM

Faculty:

Wayne D. Howard

Registration:

<http://www.monroecc.edu/depts/recreg/howtoreg.htm>

Remote learning or face to face (TBD)

For more information, email: whoward11@monroecc.edu

Spring 2022

Web Mapping

GEG 237 (3 credit hours) Part of the new micro-credential series (236, 237, 238)



This course is an introduction to Web-based GIS. Students will learn about the usefulness and application of Web GIS tools such as ArcGIS Online Story Maps, Esri Dashboard, Esri Insights, Volunteered Geographic Information (Open Street Map), and Map services (Mapbox or GISCloud). Students will become adept at storing and accessing spatial data in the cloud, practice developing Story Maps to communicate spatial data, and learn how web mapping is key to mobile GIS applications such as field data collection (Esri Field Maps). Students will be guided through a series of lectures and hands-on computer-based lab exercises. An end of a semester project will allow students to work on a project of their own design. Course material used are based upon the United States Department of Labor's Geospatial Technology Competency Model (GCTM) for entry level geospatial occupations including Geospatial or GIS Technicians or Technologists.

Prerequisites: Digital Earth (GEG 130) or permission of the instructor.



Students in this course:

- Learn important geospatial web mapping skills that are in high demand!
- Apply web GIS tools such as ArcGIS Story Maps, Open Street Maps, and MapBox.
- Develop field data collection apps.
- Apply cartographic principles in online map design.
- Practice using web maps as a tool for topics such as emergency management.

Topics covered:

- Web Mapping vs. Desktop
- Spatial Data in the cloud
- Web GIS platforms
- Online map publication on a web service
- Story Map Design
- Apply critical-thinking skills to solve problems by using Web GIS tools in the development, management, completion, and evaluation of a comprehensive geospatial project.



Day/Time:

ONLINE

Faculty:

Jonathon Little

Registration:

<http://www.monroecc.edu/depts/recreg/howtoreg.htm>

Register for a course or two: <https://www.monroecc.edu/admissions/iam/taking-a-class-or-two/>

Sample [Web Map](#)
Sample [MapBox](#)

Current MCC student Projects

13 virtual internships, NYSDOH, + many more in NYS.

3 Current International virtual internships for students:

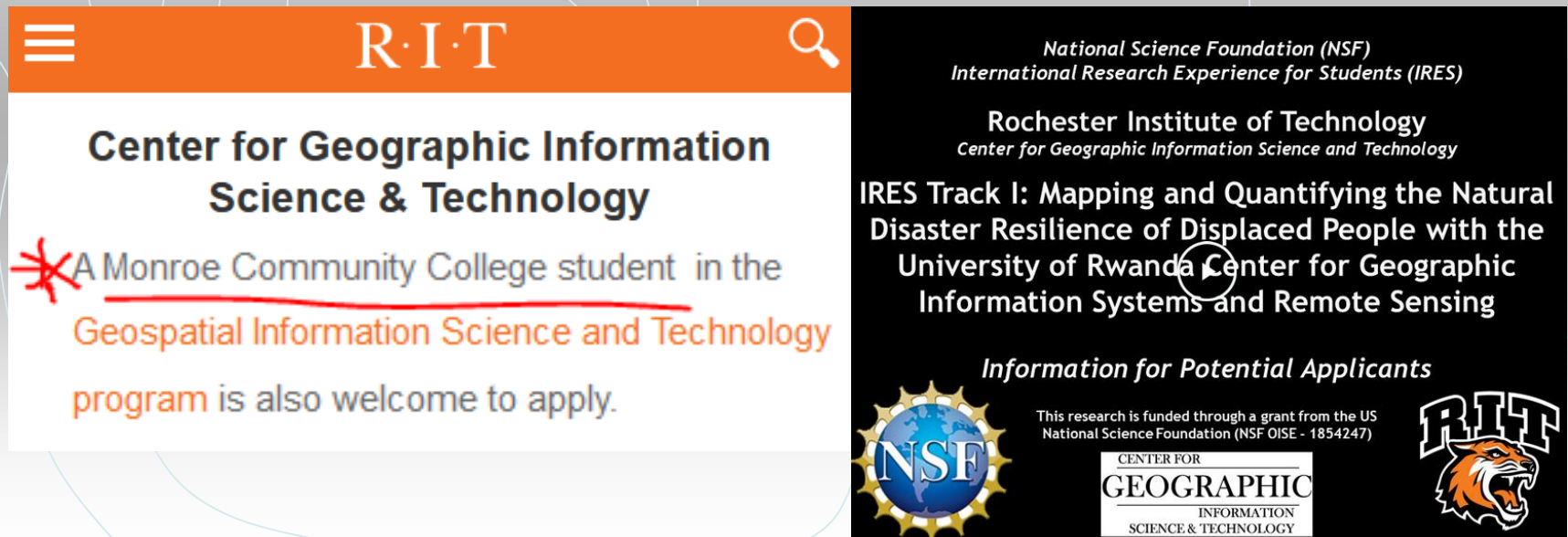
1) Cartagena, Colombia to use remote sensing (GEG 133) to assess changes in mangroves and how that is impacting the city/tourism. Ground truth in April w/ MCC student. Student travel. [VIDEO](#) 0--21 and 2:14-2:30





Current + Future MCC student Projects


International virtual internships for students:

- 3) Develop mapping app for local citizens in Mexico
- 4) Identify wheat disease in KZ
- 5) Disaster Mapping in Rwanda. *Travel!*
- 6) Malawi – app for farmers – Cornell Connection!



 **R·I·T** 

Center for Geographic Information Science & Technology

 A Monroe Community College student in the Geospatial Information Science and Technology program is also welcome to apply.



*National Science Foundation (NSF)
International Research Experience for Students (IRES)*

Rochester Institute of Technology
Center for Geographic Information Science and Technology

IRES Track I: Mapping and Quantifying the Natural Disaster Resilience of Displaced People with the University of Rwanda Center for Geographic Information Systems and Remote Sensing

Information for Potential Applicants

This research is funded through a grant from the US National Science Foundation (NSF OISE - 1854247)

 **CENTER FOR GEOGRAPHIC INFORMATION SCIENCE & TECHNOLOGY** 

Public Libraries in the U.S.

You can find magic wherever you look. Sit back and relax, all you need is a book. --Dr. Seuss



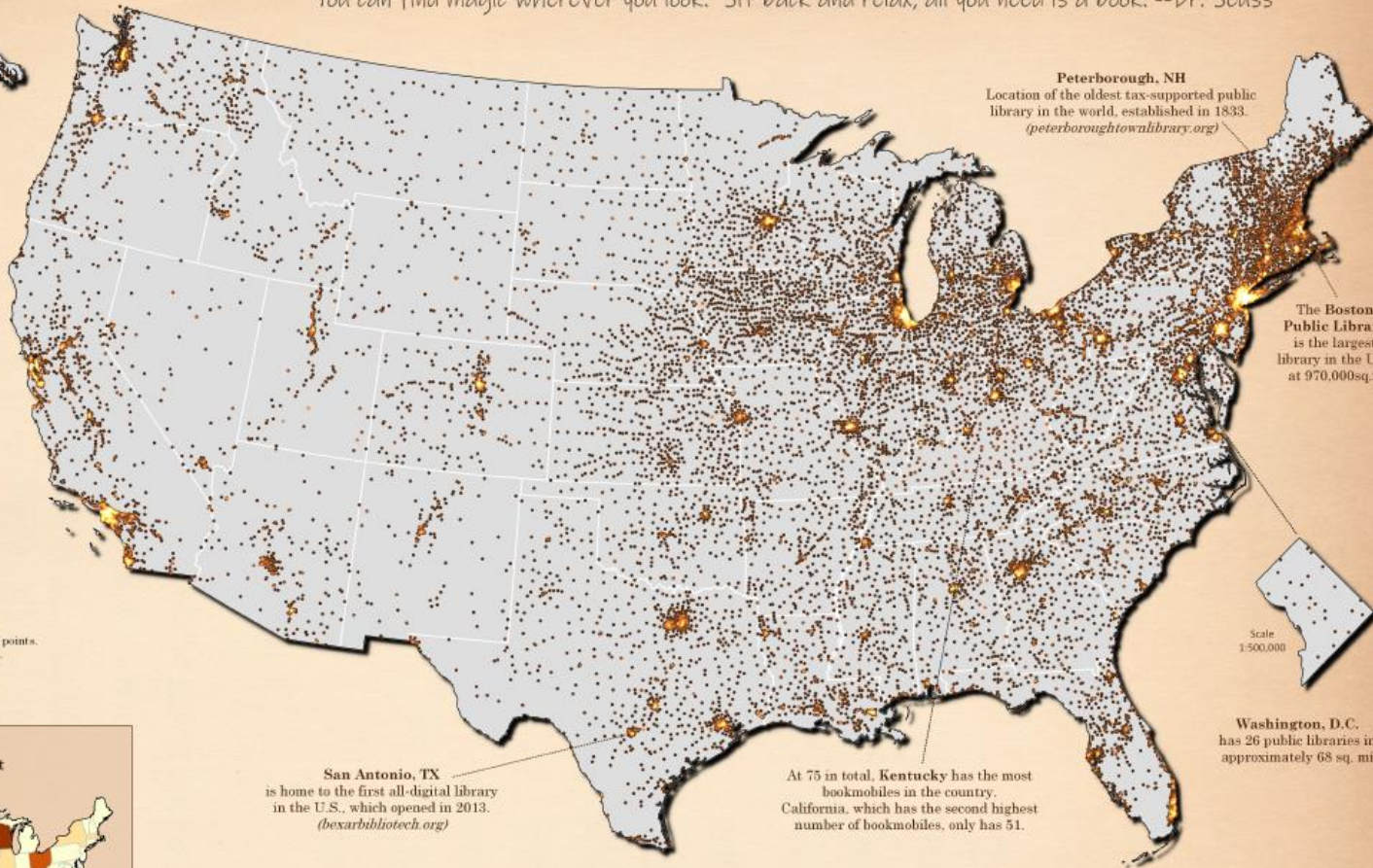
Alaska has 102 public libraries. That's 35 for every 250,000 people, but less than 1 per 1,000 sq. miles.



Hawaii has 50 public libraries. That's 9 for every 250,000 people and 8 per 1,000 sq. miles.

1 Dot = 1 Library

Bright spots denote a high concentration of points. Map contains a total of 17,409 points.



Peterborough, NH
Location of the oldest tax-supported public library in the world, established in 1833. (peterboroughtownlibrary.org)

The **Boston Public Library** is the largest library in the U.S. at 970,000sq.ft

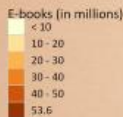
Scale
1:500,000

Washington, D.C. has 26 public libraries in approximately 68 sq. mi

San Antonio, TX is home to the first all-digital library in the U.S., which opened in 2013. (bexarbibhotech.org)

At 75 in total, **Kentucky** has the most bookmobiles in the country. California, which has the second highest number of bookmobiles, only has 51.

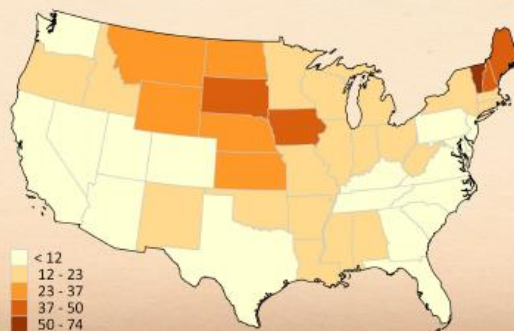
Is Print Dead? The Rise of Digital Content



In 2015, public libraries reported having just over 330 million e-books available for download by their patrons. Print books still outnumbered electronic books at almost 753 million copies.

However, as people change the way that they use and consume media, libraries have had to make changes in order to stay relevant, and it's not just books that patrons are borrowing. Audio and video downloadable materials add nearly 125 million to the total.

The Public Library Survey shows that the electronic materials increased by over 50 percent between 2014 and 2015.



Libraries per 250,000 people



Libraries per 1,000 sq. miles

August/Oct Workshops

- Reduce the digital divide through Librarian Support
- Do you want to learn more in August?
- Interested in assisting introductory GIST students in the fall for a couple hours in October?
- Interested in spatial data?
- Be on the lookout to register for the workshops.





So You Want to Make a Map

An Introduction to GIST Data

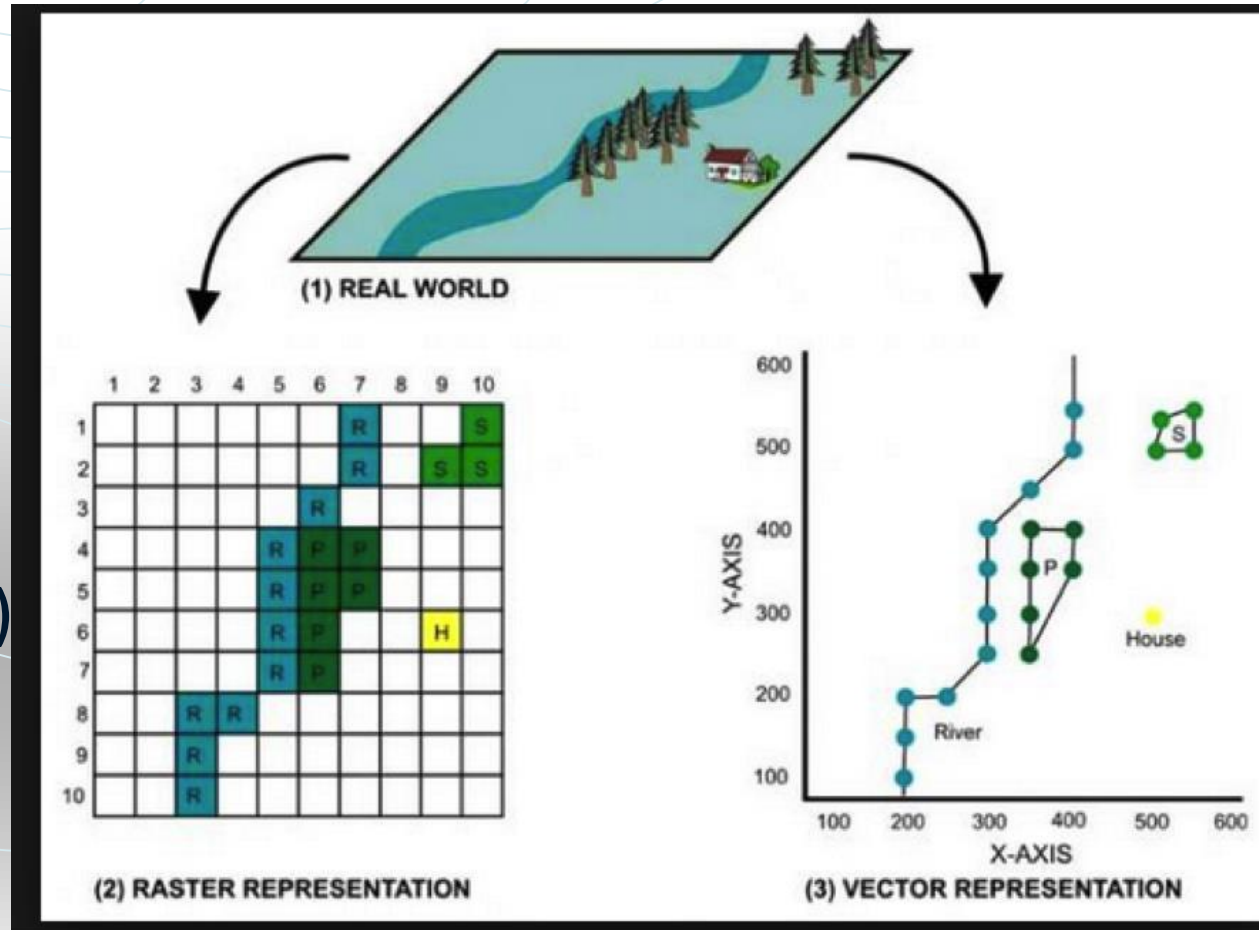
GIST Data: Vector vs. Raster data

- Vector data:

- Points
- Lines
- Polygons

- Raster data:

- Images (pixels)
- Satellite image
Landsat [video](#)
- Drone image
- Aircraft image



Vector data

Contents

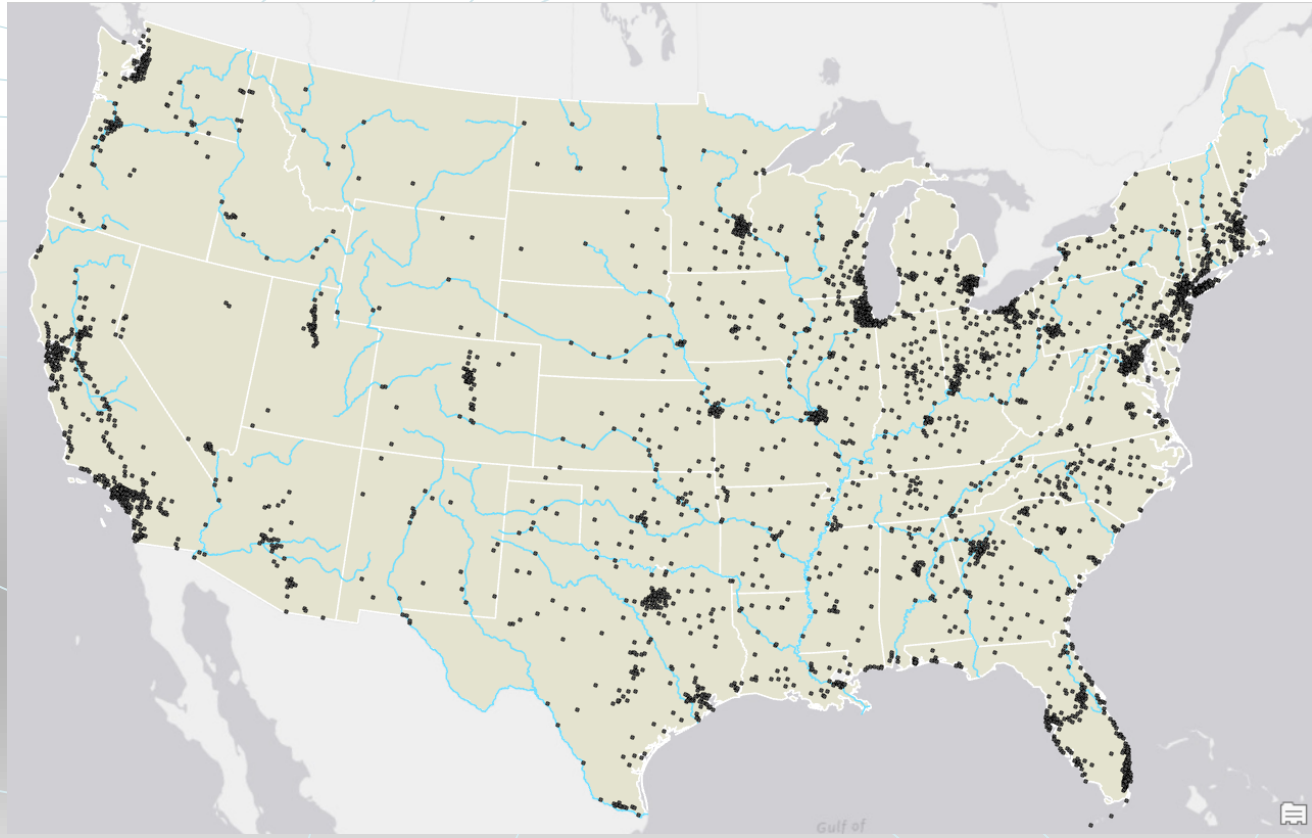
Search



Drawing Order

- Map
- cities
 -
- rivers
 -
- states
 -
- World Light Gray Canvas Base

3 datasets



GIST Software options

ArcGIS Online,
ArcGIS Desktop and
ArcGIS Pro

Open source options
are also available!
Example: QGIS



Hands on Activity: ArcGIS Online

1. Cholera Outbreak map

2. Living Atlas

3. Choose one! Skip sign in! Skip Saving!

Explore Spatial Data
Make a map of China

4. Be ready to share!

London Cholera Outbreak, 1854

Heat map of the cholera outbreak in the Soho District of London in 1854

Learn ArcGIS | Draft



Share

- Share something in chat about Living Atlas, spatial data or China map exercise.

The screenshot shows the ArcGIS Living Atlas of the World website. At the top, there is a navigation bar with the Esri logo and links for ArcGIS, Industries, About, and Support. A search bar is located in the top right corner with a 'Sign In' button. Below the navigation bar is a dark header with the text 'ArcGIS Living Atlas of the World' and a menu with options: Home, Browse (highlighted), Apps, Blog, Contribute, My Contributions, and My Favorites. A search bar is centered below the header with the placeholder text 'Search Living Atlas for maps, apps, and more' and a search icon. Below the search bar are 'Search Examples' and a row of category icons: All, Trending, Basemaps, Imagery, Boundaries, People, Infrastructure, and Environment. Below the categories are filters for 'All content types', 'All time', 'All regions', 'Esri-only content', and 'Authoritative-only content'. A 'Sort by: Relevance' dropdown is on the right. A '8922 Results' badge is visible. Two search results are shown: 'World Imagery' (Tile Layer By esri) and 'USA Current Wildfires' (Feature Layer By esri_livefeeds2). Both results include a thumbnail image, a title, a description, and an 'Authoritative' badge.

- If you have any questions, please let me know either in chat or by email – jlittle@monroecc.edu

Workshop Survey!

https://rit.az1.qualtrics.com/jfe/form/SV_0oFAONZXSy24Neu

Thank you!

Questions: Microcredential, GIST Certificate, upcoming workshops, other?

Email: Jon jlittle@monroecc.edu

Geography



Geospatial Information Science and Technology (Gist)

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

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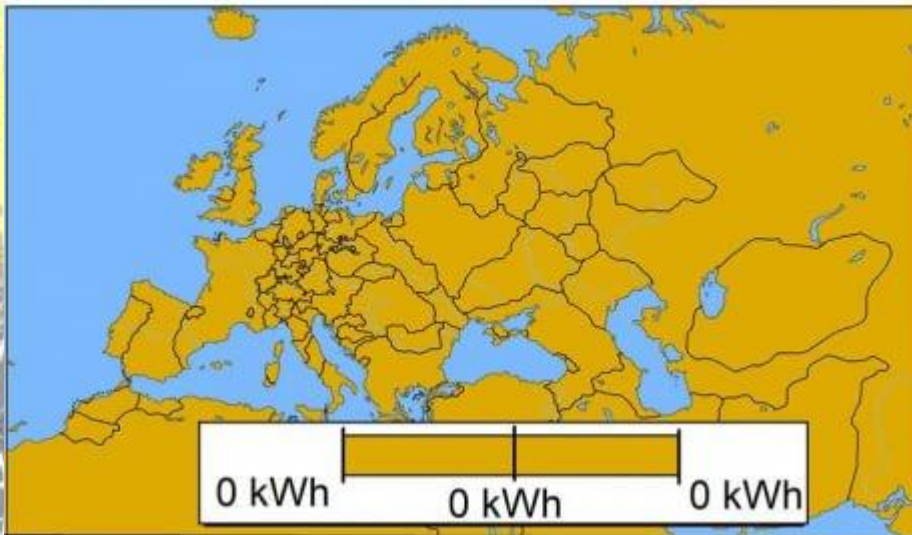
[Explore Careers >](#)

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

Workshop Survey!

Questions Email: Jon jlittle@monroecc.edu

Electricity consumption in Europe in 1507



COUNTRIES WITH MORE PEOPLE THAN BANGLADESH



2 Countries with more people than Bangladesh

A very tiny, very crowded country. [Via Reddit](#)

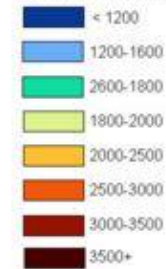
Workshop Survey!

Questions Email: Jon.jlittle@monroecc.edu

Europe vs USA: Sunshine Duration In Hours Per Year

Europe vs the United States

Sunshine duration in hours per year.



Metal Bands Per 100,000 People

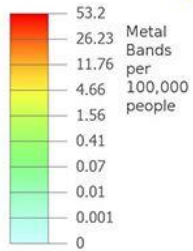
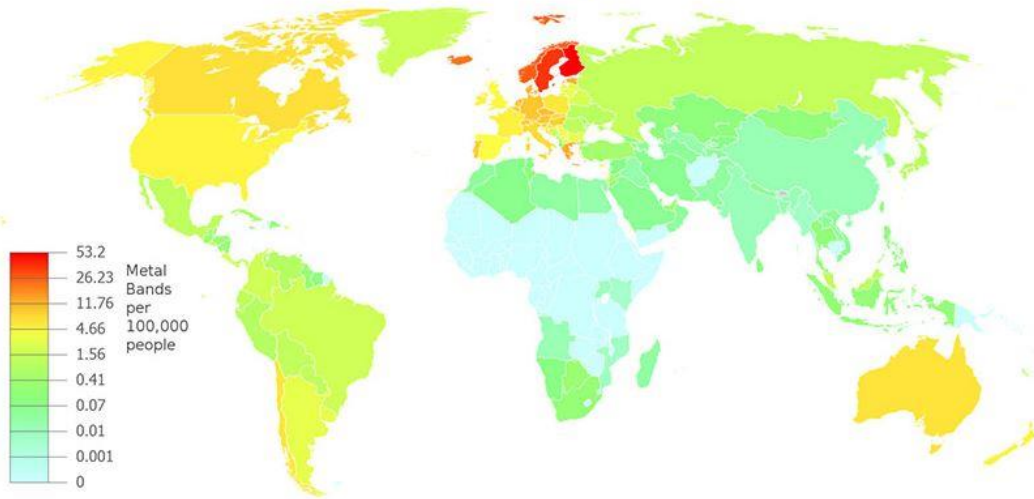


Image credits: targetmap.com

Image credits: imgur.com