Geospatial Program to Support MCC Students

Heather Pierce: Assistant Professor of Geography/GIS

Jonathon Little: Associate Professor of Geography/GIS

Your 30 second intro…

- Name

- Library/role

- What is your favorite map or when was the last time you made a map

Monroe Community College
STATE UNIVERSITY OF NEW YORK

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

Heather Pierce: Assistant Professor of Geography/GIS

Jonathon Little: Associate Professor of Geography/GIS

Wayne Howard: Adjunct Professor and Solara Concepts

Thanks to
Capital District Library Council and Susan D'Entremont
University of Albany and Priscilla Seaman

Your 30 second intro…

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Welcome and Introductions

Your 30 second intro…

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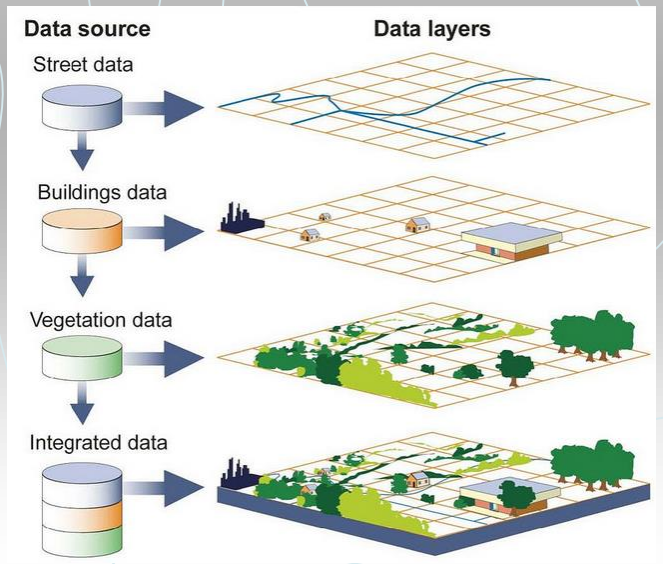


https://www.nationalgeographic.org/encyclopedia/geographic-information-system-gis/

Q: What is geospatial technology?

What is Geospatial Technology?

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

- Geospatial Revolution Trailer
  https://www.youtube.com/watch?v=mBlUwPcFjCw

MCC's Geography/GIST program

Current:

24 Credit GIST Certificate

9 credit micro-credential for GIST professionals

A.S. Geography

A.A.S. Geography concentration in GIST. Stackable!

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

Start My Application >

Explore Careers >

School of Science, Technology, Engineering & Math (STEM)

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.

GIST Certificate Information

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 and A.S. in GIST

Microcredential

Requirements

GEG 236, Geospatial Data Acquisition and Management, 3 credits, C or higher.
Prerequisite: GEG 130 and Corequisite GEG 133 or GEG 133 pre-req, or instructor permission.

GEG 237, Web Mapping, 3 credits, C or higher,
Prerequisite: GEG 130, or instructor permission.

GEG 238, Introduction to Geospatial Programming, 3 credits, C or higher.
Prerequisites: GEG 130, GEG 133, and GEG 230 or GEG 236 all with a grade of C or higher, or instructor permission.

A.A.S. in GIST

Monroe Community College
STATE UNIVERSITY OF NEW YORK

A.A.S. degree in Geospatial Information Science Tech (GIST)

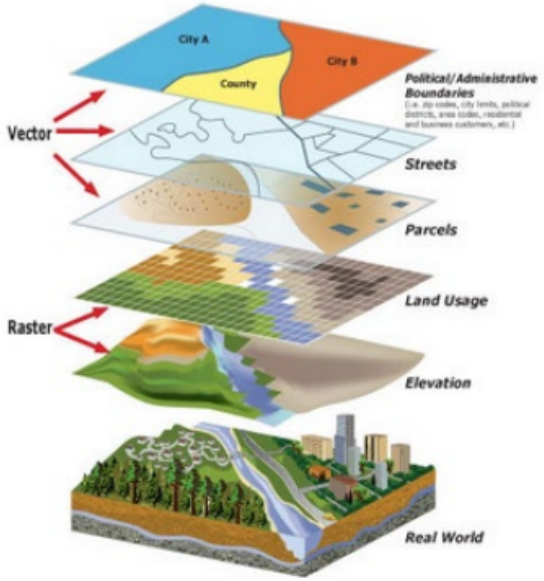
What is GIST?

Geospatial Information Science & Technology (GIST) is a growing field of study that includes Geographic Information System (GIS), Remote Sensing (RS), drones, and Global Positioning System (GPS). GIST allows us to acquire data and use it for analysis, modelling and visualization. GIST is a part of everyone's daily life (finding nearest restaurant) to marketing, politics, and environment.

Salary? What do GIST Professionals do?

Projected growth* through 2028 is faster than average. Median wage† for mid-career $50-88K/yr.

Potential employers include: EagleView, LaBella Associates, Esri, NY City, Town of Oswego, and more. GIST professionals pursue careers in education; business; government; and nonprofit organizations. Job titles: Geospatial technician and analyst, Remote Sensing Analyst, Drone pilot, cartographer, surveying and mapping technicians.



New Courses (micro-credential*):

GEG 236 Geospatial Data Acquisition & Management

GEG 237 Web Mapping

GEG 238 Introduction to Geospatial Programming

Past/Current MCC student Projects

13 virtual internships, including many in NY state.

<u>International virtual internships for students:</u>

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

Past/Current MCC student Projects

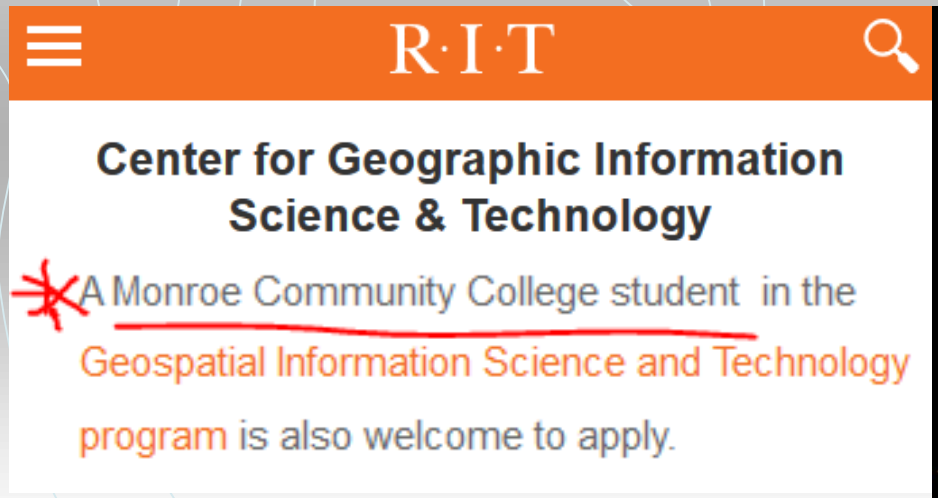
International virtual internships for students:

2) Assess land cover changes in Costa Rica

3) Develop mapping app for local citizens in Mexico to collect water quality data.

4) Identify wheat disease in KZ

5) App development for farmers - Malawi



MCC student Opportunities

2022 Virtual Internships in GEG 239

1) Mexico

2022 Student travel

1) Rwanda
2) Maine – University of Maine (forests + remote sensing)

2023 Student Travel Opportunities + Project

1) Disaster Mapping in Rwanda as a part of a NSF IRES Rwanda led by RIT (2022-2025)
2) *University of Maine*

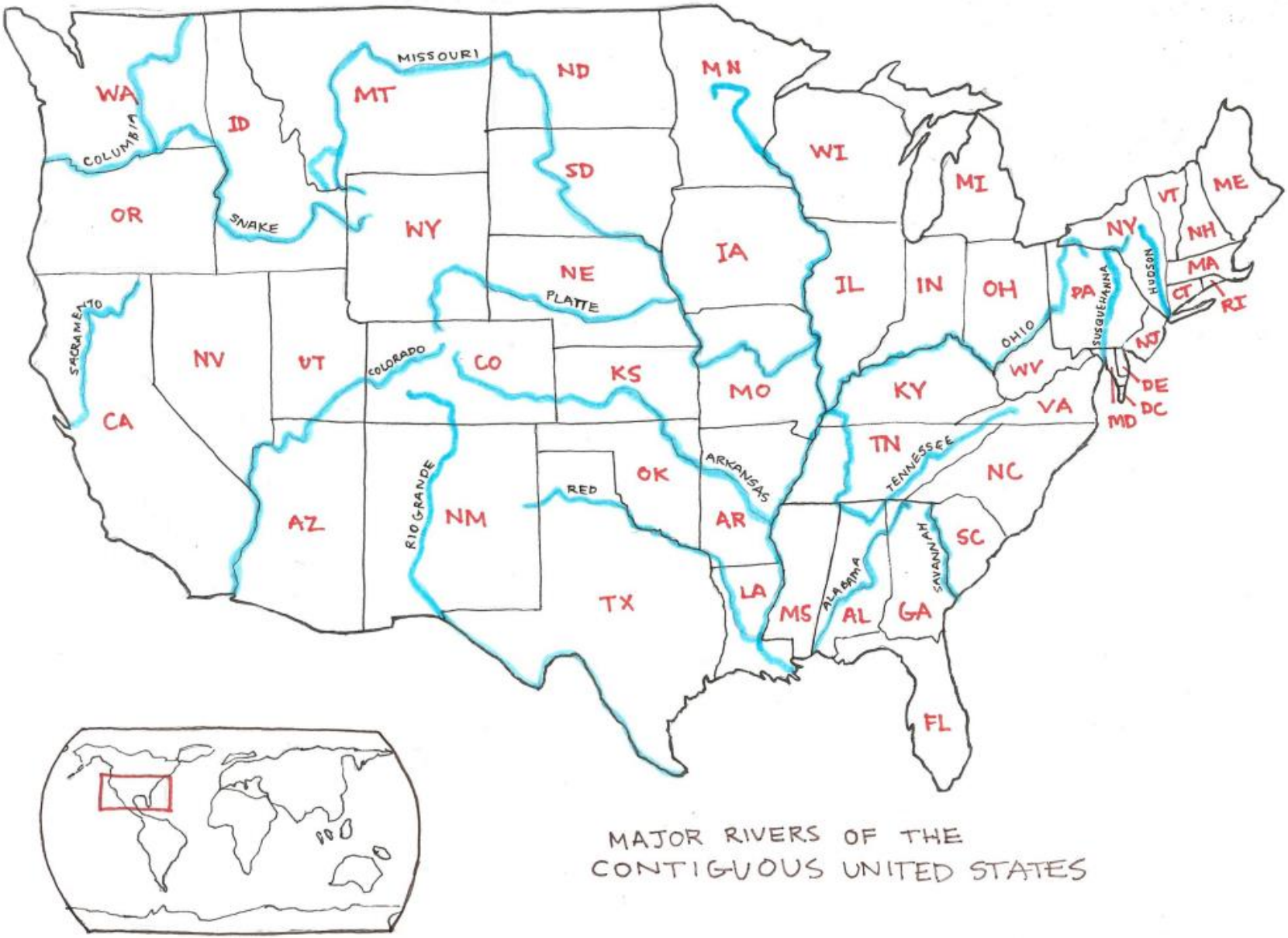
Goals of the workshop

- 1) GIST/Geospatial awareness
  2) Learn more about MCC's GIST program
  3) Provide very basic support to introductory GIST students the first week or two of classes (e.g., accessing software, saving, accessing data)
  4) Provide student support midway through the semester as students work on finding GIS data. The librarians will not be providing GIS technical support, which we will make clear to students.

Questions/Break, return at…

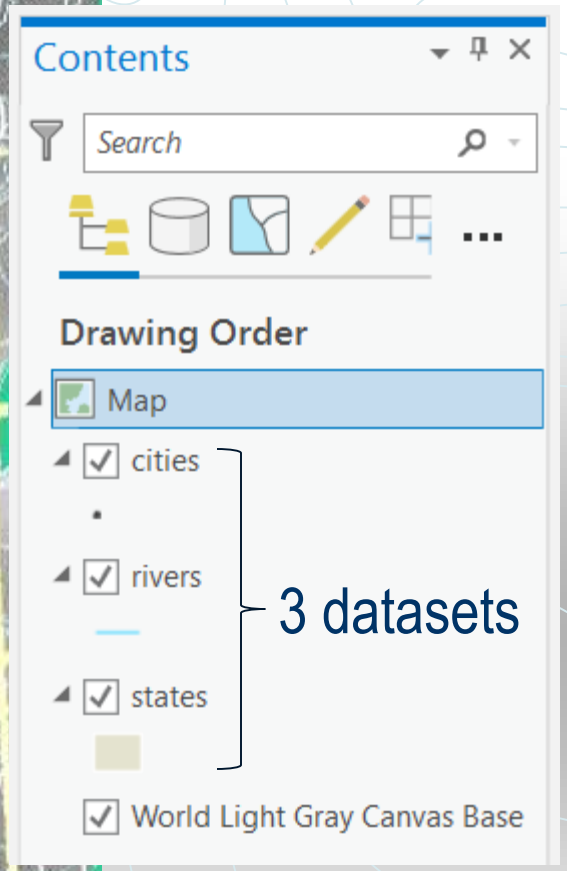
So You Want to Make a Map

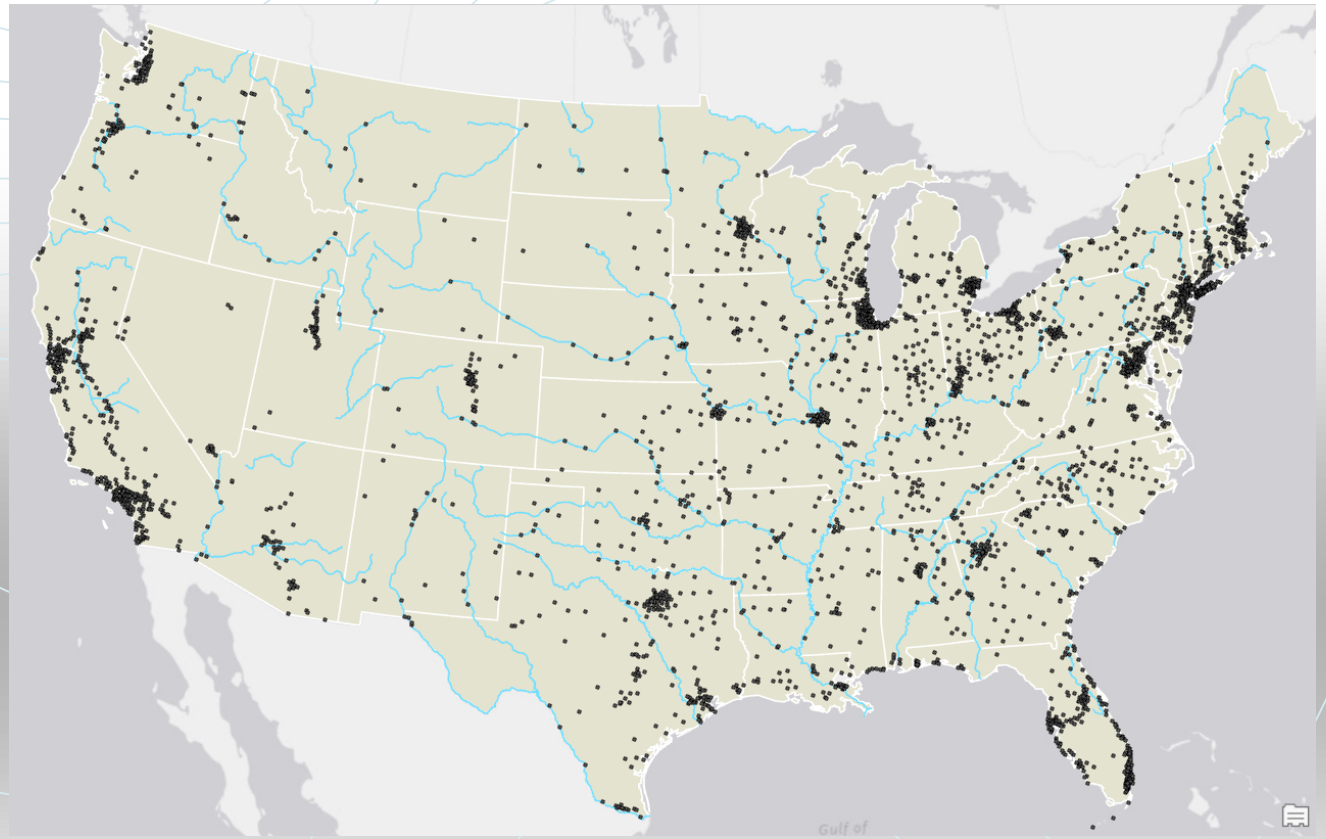
An Introduction to GIS Data



MAJOR RIVERS OF THE CONTIGUOUS UNITED STATES

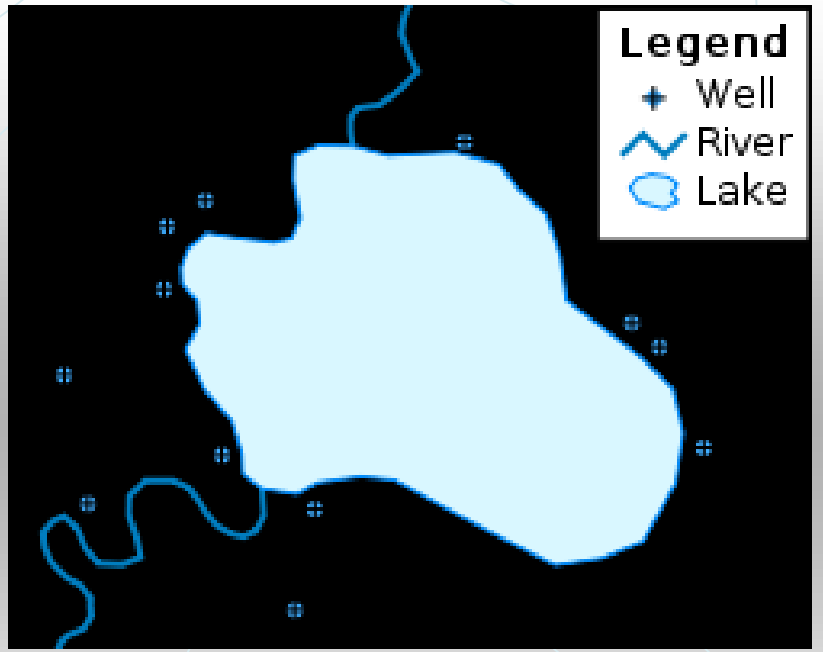
A GIS map contains layers





Some layers contain features

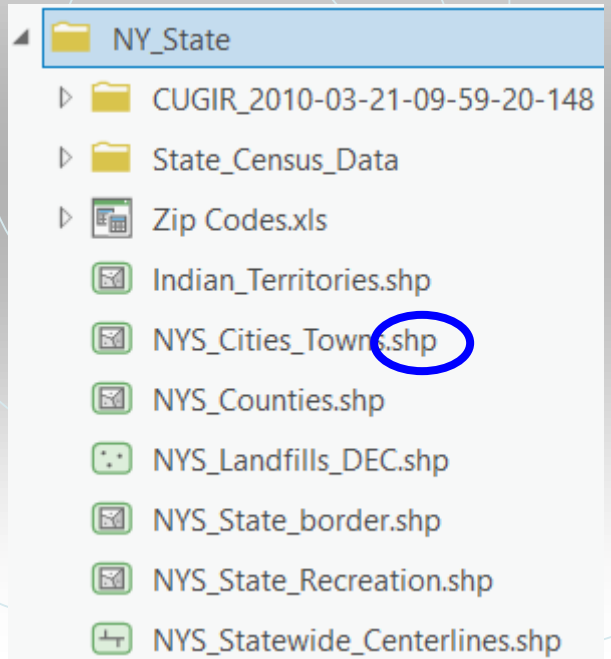
- Features have shape and size
  - **Vector data**:
    - **Points**
    - **Lines**
    - **Polygons**

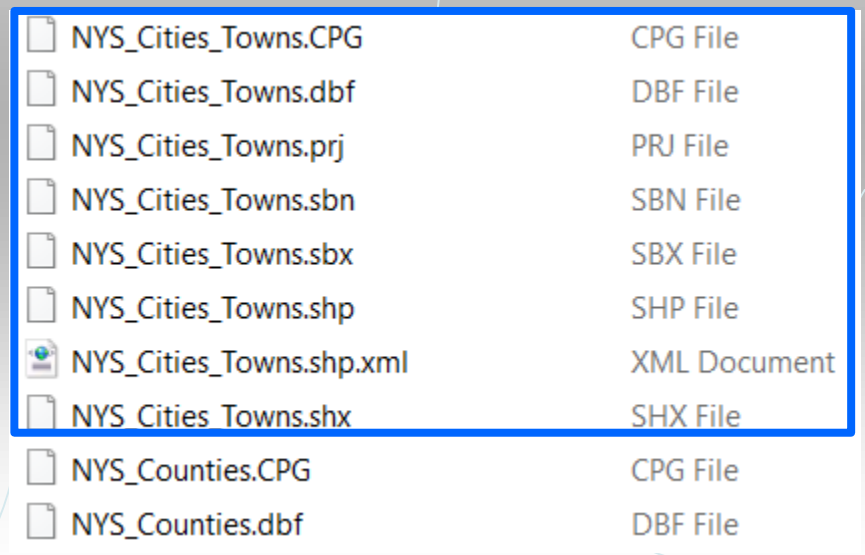


Common vector data formats

- **Shapefile (.shp)**
  - Can only be stored in a folder

points lines polygons



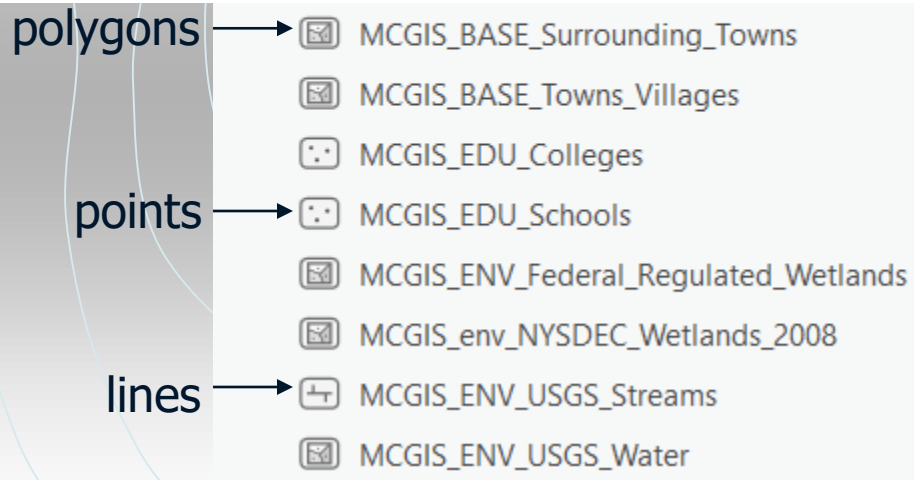


Common vector data formats

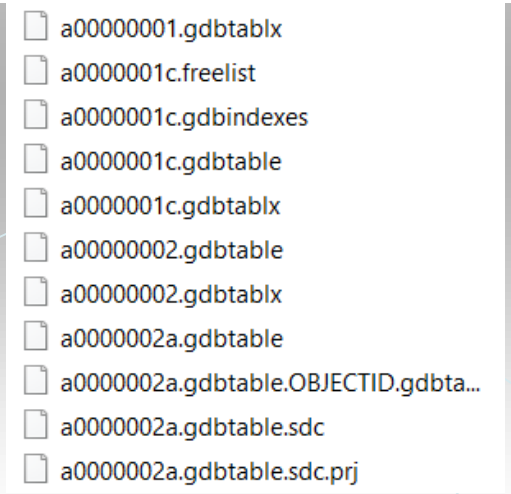
- **Feature class** (no file extension)
  - Can only be stored in a geodatabase

Files available to the Public

Files	Download	Metadata
NYS Civil Boundaries	GEODATABASE SHAPE	Metadata -



ArcGIS view



Windows view

Special Mention: Table Data

- Spreadsheets can be used if they have one of the following:
  - Latitude/Longitude (X/Y coordinate)
  - Address
  - Quantitative or qualitative data given per area
    - Ex. acres of crops grown per county, most popular baby name per state.

	A	B	C	D	E	F	G	H	I	J	K	L
1	County	Type	Y2009	Y2010	Y2011	Y2012	Y2013	Y2014	Y2015	Y2016	Y2017	Y2018
2	Albany	Total Arrests	9487	9236	8744	8999	8851	8198	7886	8131	8006	7115
3	Allegany	Total Arrests	1252	1234	1158	1164	954	915	819	951	798	827
4	Bronx	Total Arrests	88010	87702	84060	77368	73580	72383	64096	60258	54319	47420
5	Broome	Total Arrests	5556	5399	5671	5535	5762	5570	5238	5500	5586	5076

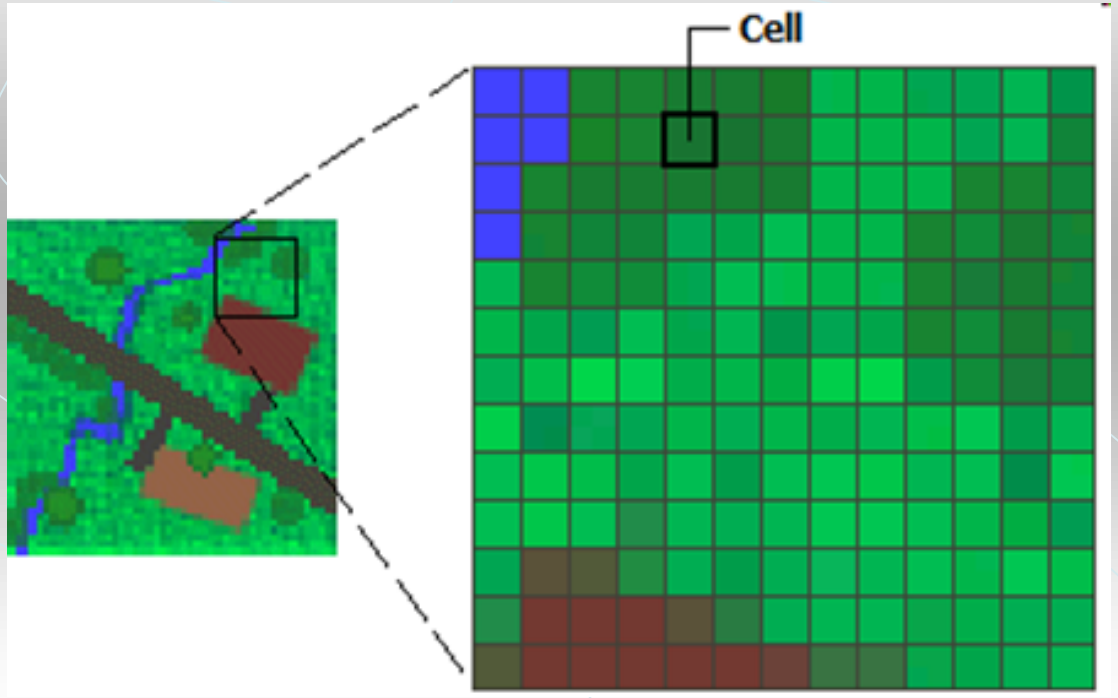
Counties_Shoreline

Field: Add Delete Calculate Selection: Zoom To Switch Clear Delete Copy

OBJECTID	Shape	NAME	ABBREV	GNIS_ID	FIPS_CODE	SWIS	NYSP_ZONE	POP1990	POP2000	POP2010
1	Polygon	Albany	ALBA	974099	36001	010000	East	292594	294565	304204
2	Polygon	Allegany	ALLE	974100	36003	020000	West	50470	49927	48946
3	Polygon	Bronx	BRON	974101	36005	600000	Long Island	1203789	1332650	1385108
4	Polygon	Broome	BROO	974102	36007	030000	Central	212160	200536	200600

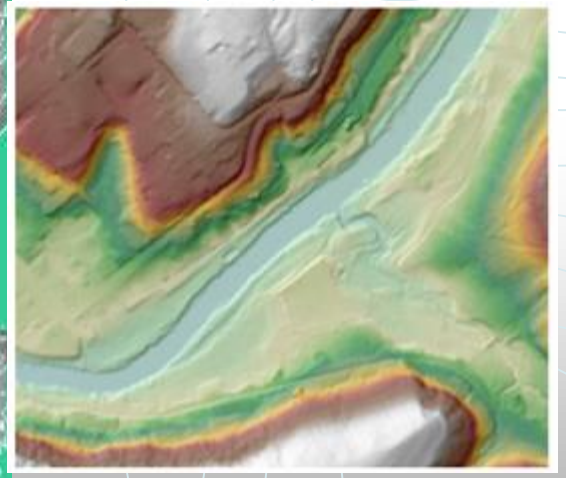
Some layers are surfaces

- Surfaces have numeric values
  - **Raster data**
    - A grid of square cells (i.e. pixels)



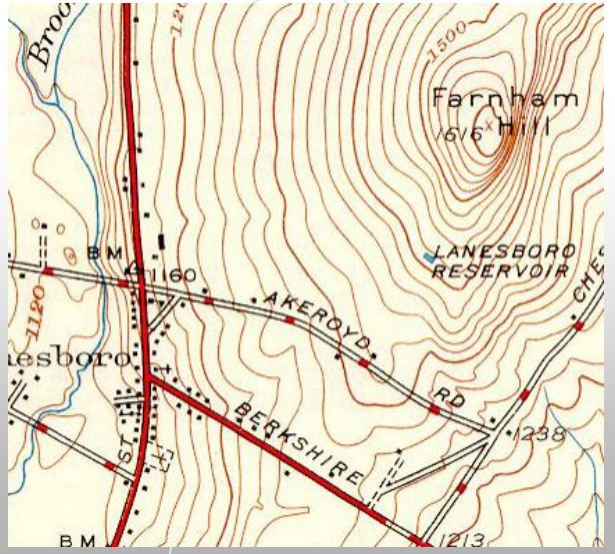
Raster data

- Often used as a basemap, but can be used for analysis



DEM

Satellite data



Topo map

- **Common raster formats**:
  - TIFF (.tif), JPEG 2000 (.jp2), MrSid (.sid), image (.img), etc.

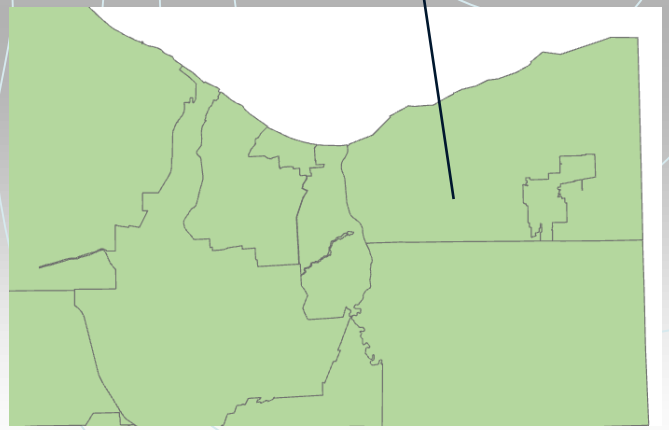
Map features are linked to info

- Information is stored in an **attribute table**

MCGIS_BASE_Towns_Villages

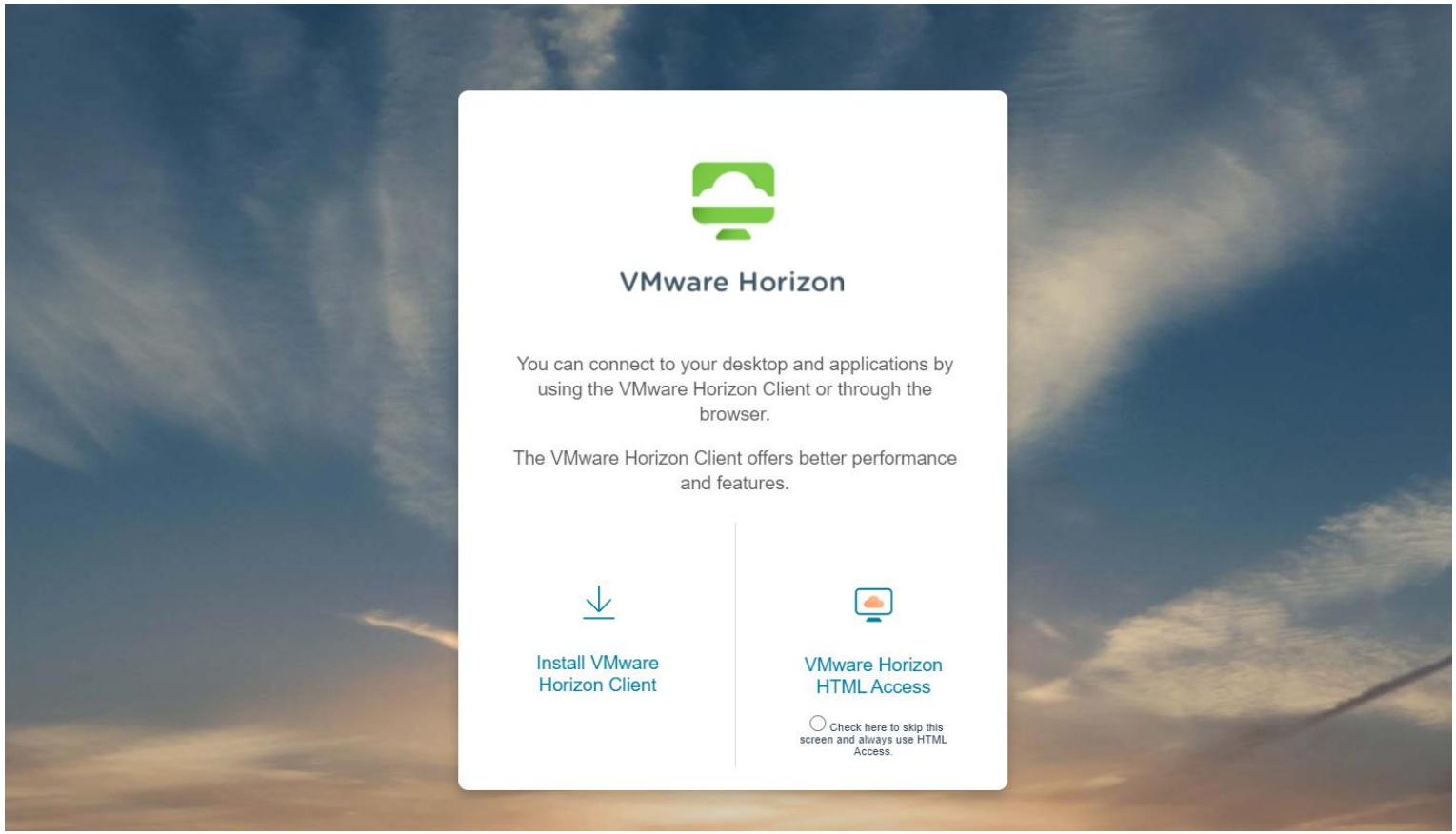
Field: Add Delete Calculate | Selection: Zoom To Switch Clear Delete Copy

OBJECTID	Shape	NAME	TYPE	COLOR	Shape_Length	Shape_Area
16	Polygon	Rush	Town	2	144479.75039	854206417.085859
17	Polygon	Churchville	Village	5	43391.61557	32121320.929048
18	Polygon	Webster	Town	3	186782.207819	914652448.160198
19	Polygon	East Rochester	Town	5	44031.315007	36589730.106925
20	Polygon	Brockport	Village	5	53343.099995	61648849.647938



Data in the attribute table can be selected, filtered, queried, and summarized.

Log on to the Virtual PC (VMware)



https://horizon.monroecc.edu/

Hands on Activity: ArcGIS Pro

We are available for breakout session for support

Lunch

Return at …

Finish ArcGIS Pro

Supporting MCC introductory GIST students through Zoom and Project Data

Expectations and Timeline:

Activities/Expectation	Timeline (# hours)
Complete ArcGIS Pro Activity	Workshop ~1.75 hrs
Complete Finding GIST Data	Workshop ~0.5 hrs
Complete workshop survey	Workshop ~0.25 hrs
Your Bio (text, online if possible)	Workshop ~0.25 hrs

Provide·GIST·project·data·support·to·cohort·of·introductory·students·face·to·face·or·Zoom¤	Late·Oct/Nov··~0.5·hr¤
Webinar·on·finding·GIS·data¤	Week·of·Oct·7·@·2·pm·····1.5·hour¤

Finding GIST data

Wayne Howard
Solara Concepts & GIS Adjunct

Finding GIS Data

Supporting Our Students

Digital Earth (GEG 130) Project Example

Are there enough DMV Offices in Monroe County?

Konstantin Sytch
GEG 130 – Digital Earth, Fall 2017

Problem Statement

There are approximately 749,600 citizens in Monroe County, and over half of them have a driver's license. With that many drivers, only three permanent-location DMV offices may not be enough. If there were more DMV office locations, people would not have to drive so far, wait in line for long periods of time, or wait for the right day for the Mobile DMV to be open in their town. More DMV office locations may be needed to serve the 749,600 citizens in Monroe County more efficiently.

Introduction

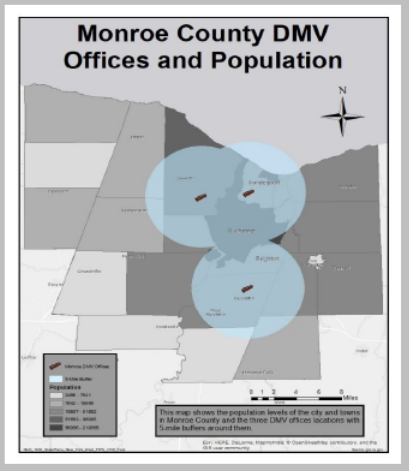
The wait times in the Monroe County DMV offices average between 15 minutes to an hour. These kind of wait times show there is scarcity and inefficiency. Many people who work full-time jobs can't leave work for such long periods of time to take care of their vehicle or other needs at a DMV office. A 10-mile, one-way drive and an hour wait time is excessive. This project analyses the locations of DMV offices and other factors that should be considered when choosing good locations and figuring out how to serve the population best.

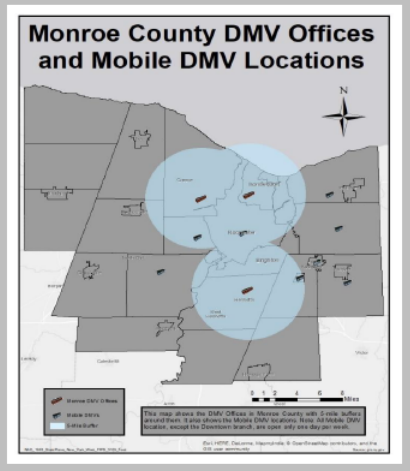
Methods

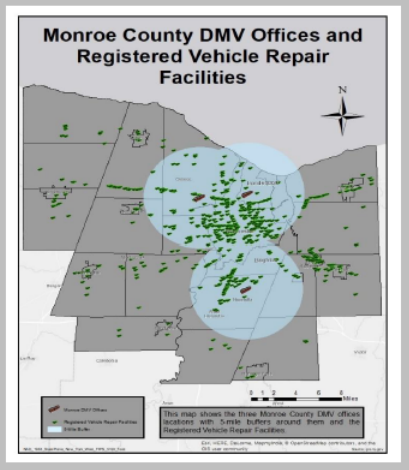
The Monroe County maps were created using ArcMap in the Transverse Mercator Projection. The data used in this project included DMV office locations, Mobile DMV locations, population, registered repair facility locations, and registered inspection facility locations. The shapefile of Monroe County and Monroe County population was provided by Monroe Community College. The DMV office location dataset, registered repair facility location dataset, and the registered inspection facility location datasets were provided by the NYS GIS Clearinghouse. The information on the Mobile DMV locations was entered into an Excel spreadsheet manually and then geocoded. All the maps were created using ArcMap.

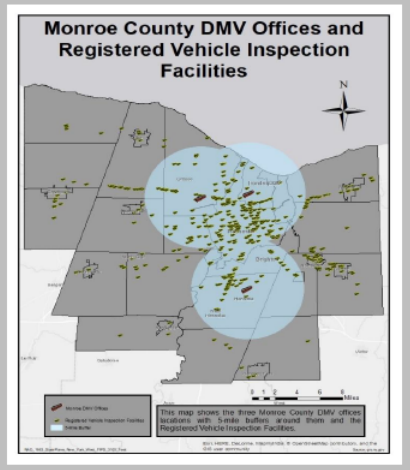
Results

Although the three Monroe County DMV offices seem to be placed in good locations, the results are what one might expect: three DMV office locations are probably not enough to serve the current population in a timely manner. A large part of western Monroe County is located more than five miles from a DMV office. Although the area is large, the population isn't. The bigger concern are the towns on the east side. These towns have larger populations and more businesses. That means that during the day there are many people in this area. With the current DMV office locations and the inconvenient hours, this is a problem. Also in this area, there are three main spots for dealers and automotive repair and inspection facilities. One big area is along Ridge Rd in Webster; other dealers are clumped on Route 31F and the North Washington St/Panorama Trail area. These businesses deal with automobiles. It would be beneficial to have a DMV office nearby.









Discussion

Although New York State has tried adding Mobile DMV locations, many people don't know about them, and even when they do, they can't make it during the hours of operation. All the Mobile DMVs are open from 10:00 A.M. to 3:30 P.M. For most people, that is directly in the middle of their workday. It seems that adding another DMV office would provide benefits such as less driving, less waiting, and better hours of operation. Instead of focusing on Mobile DMVs to be the solution, a permanent office location would probably be a better option.

Future Work

Something that could be examined in the future is where to place another DMV office. Looking at the data, somewhere in Penfield would probably be an ideal location since it is central to the three towns that have populations ranging from 19,857 to 51,692 and have no DMV offices.

Acknowledgements

This work would not have been possible without the information provided by the NYS GIS Clearinghouse and the help of Professor Pierce. Any findings, opinions, conclusions, or recommendations in this project are based on the information that was found and the opinion of that author, and do not necessarily reflect the views of Monroe Community College.

Sources

DMV.ORG. (n.d.). Monroe County, New York DMV Office Locations. Retrieved December 2017, from DMV.ORG: https://local.dmv.org/new-york/monroe-county/dmv-office-locations.php

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Public. (n.d.). Monroe County, New York. Retrieved December 2017, from Wikipedia - The Free Encyclopedia: https://en.wikipedia.org/wiki/Monroe_County,_New_York

NEW YORK STATE OF OPPORTUNITY. Department of Motor Vehicles

Data Exploration Activity

- Objective: Find a GIS dataset on a topic of interest
  - Think about:
    - Theme - What are you interested in that can be mapped?
    - Location - Whole world? One state? A city?
    - Date - Current or historical data?

- Example:
  - I'd like to make a map of vacant land in Rochester
    - What layers might be needed?
    - Where can I download them?
      - https://data.cityofrochester.gov/

Data Exploration Activity

- On your own: Find a GIS dataset on a topic of interest
  - Optional: can download it and bring it into ArcGIS

- Share with the group at the end:
  - What type of data is it?
  - Where did you find it?

- Can start here: https://libguides.monroecc.edu/gist/start

Introducing yourselves to students

- Email conversation to start to determine what day/time works
- Zoom

Introducing yourselves to students

- Availability for Zoom with students in
  - MCC early September
  - MCC October/November (as they begin their projects.

1.5-hour Webinar in fall

Support Fall with geospatial data for student project

Webinar Thursday, Oct 6 2-3:30

Workshop Survey!

Thank you!

Questions

Email: Jon jlittle@monroecc.edu

Wayne whoward11@monroecc.edu

Heather hpierce@monroecc.edu

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 >

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