What is Geography and GIST?

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. Created 2024.

My name is Catherine DuBreck!

Education: BA Geography, 2015 (SUNY Geneseo)
MSc Geography, 2017 (Canada)
GIST Certificate, 2020 (MCC)
GIST Microcredential, 2023 (MCC)

Full-time Job: GIS Consultant, Locana
Part-time Job: GIST Employee, MCC
Part-time Job: Adjunct Lecturer, RIT

Volunteer: NYS GIS Association Board of Directors
NYS GIS Association Communications Committee
Friends of Webster Trails

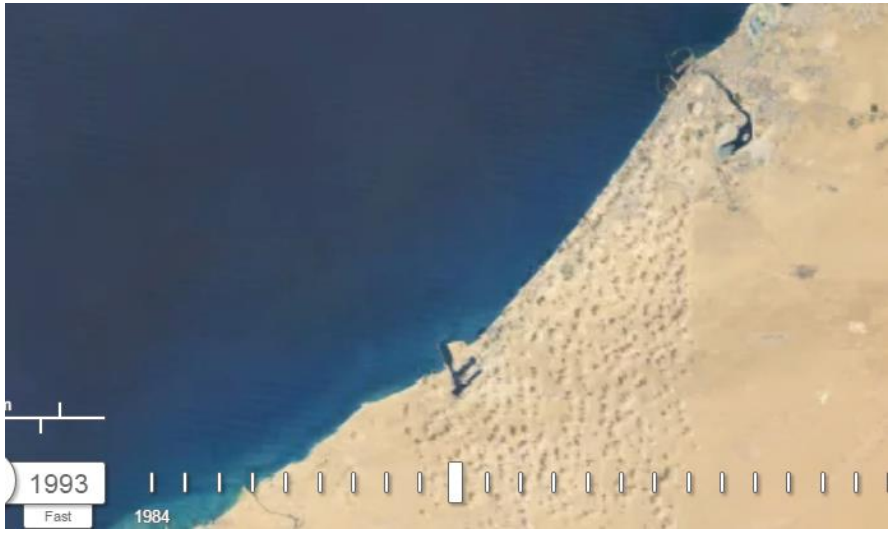
My name is Catherine DuBreck!

- My college plan: study physics & work for NASA
- My college reality:
  - ~~Physics~~ didn't understand, withdrew
  - ~~Biology~~ understood biology but not other required classes & failed organic chemistry
  - Need to pick a major before I get kicked out of college…
- Then I found… Geography!

What is Geography?

- Study of anything over space (spatial) and time

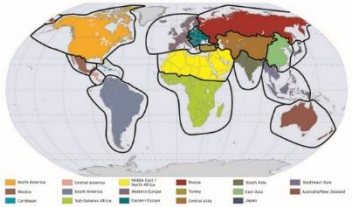
- The study of Earth and **where** things are



Four Subfields of Geography

Physical Geography
Physical/natural science subfield

Human Geography
Human/social science subfield



World Regional Geography
Unique aspects of places related to their culture, economy, climate, & environment

Geospatial Technology
Subfield focused on tools geographers use: GIS, Remote Sensing & GPS

What is GIS?

Geography… What's in a map?

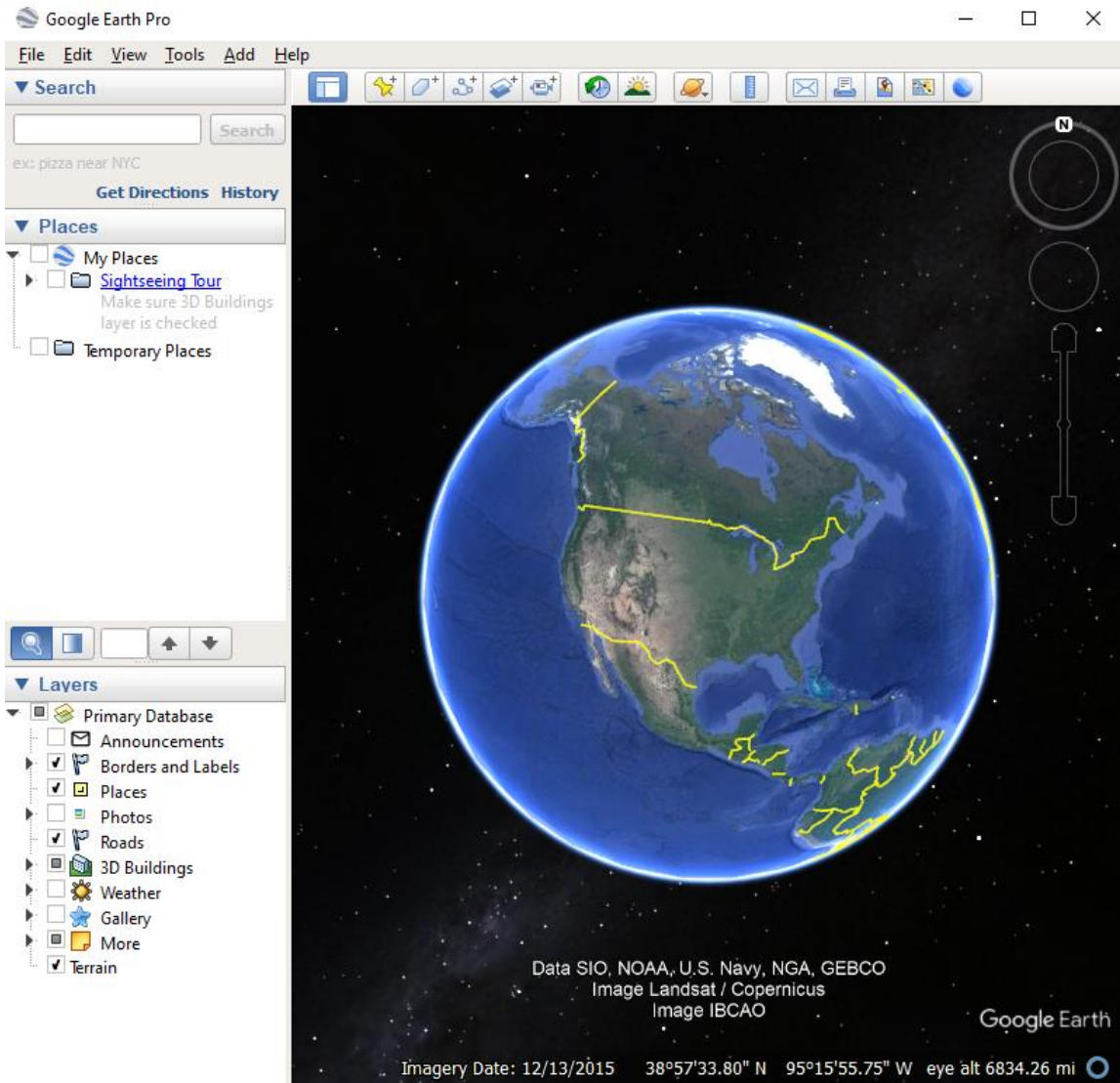
- Geography – the study of Earth & where things are
- How do we study this? MAPS!
- **GIS** – Geospatial Information Science
  - G = Geographic or Geospatial
  - I = Information
  - S = Systems or Science

- Maps use spatial data
  - Can you think of an example when you used spatial data or geospatial technology in your life?

What is GIS?

Thinking spatially…

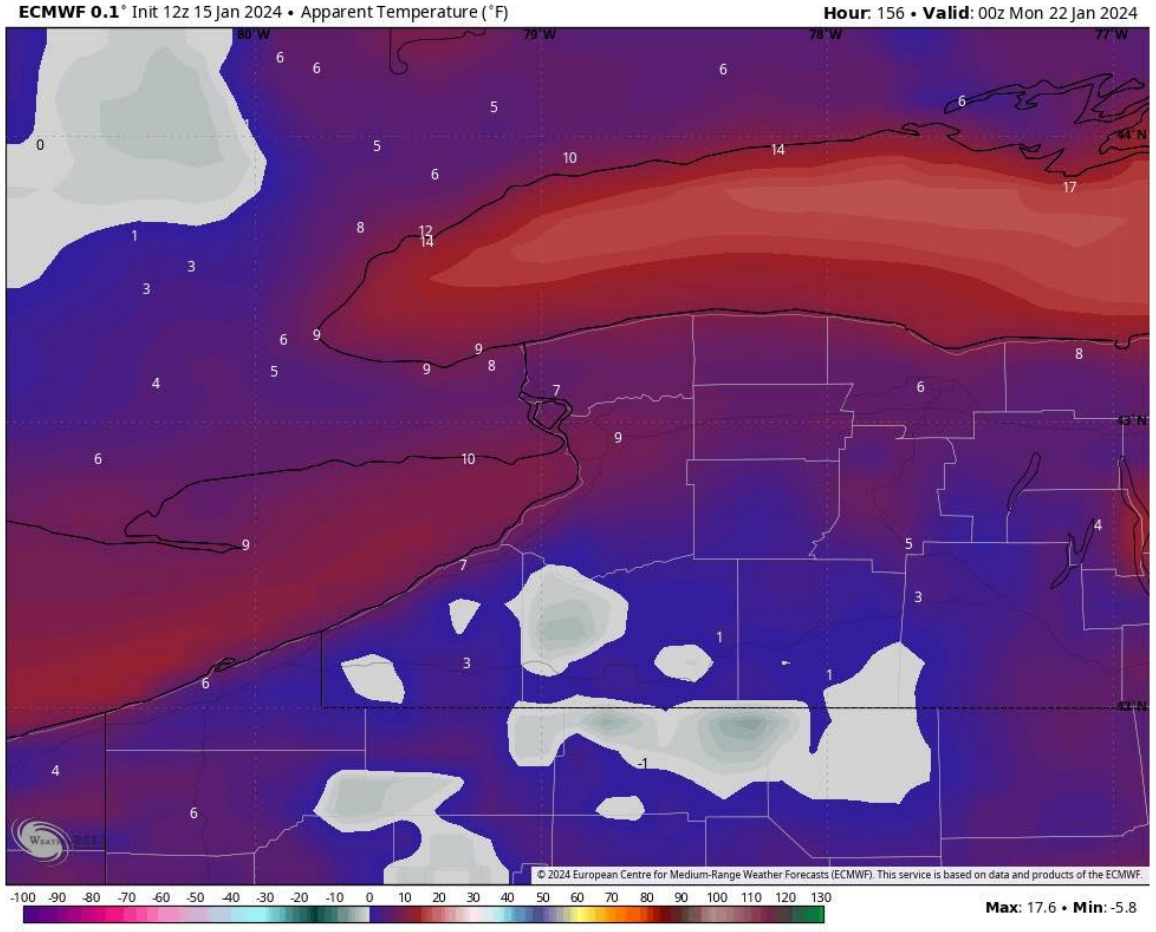
- Google Maps/Earth



What is GIS?

Thinking spatially…

- Google Maps/Earth
- Weather maps



What is GIS?

Thinking spatially…

- Google Maps/Earth
- Weather maps
- Movies/TV

What is GIS?

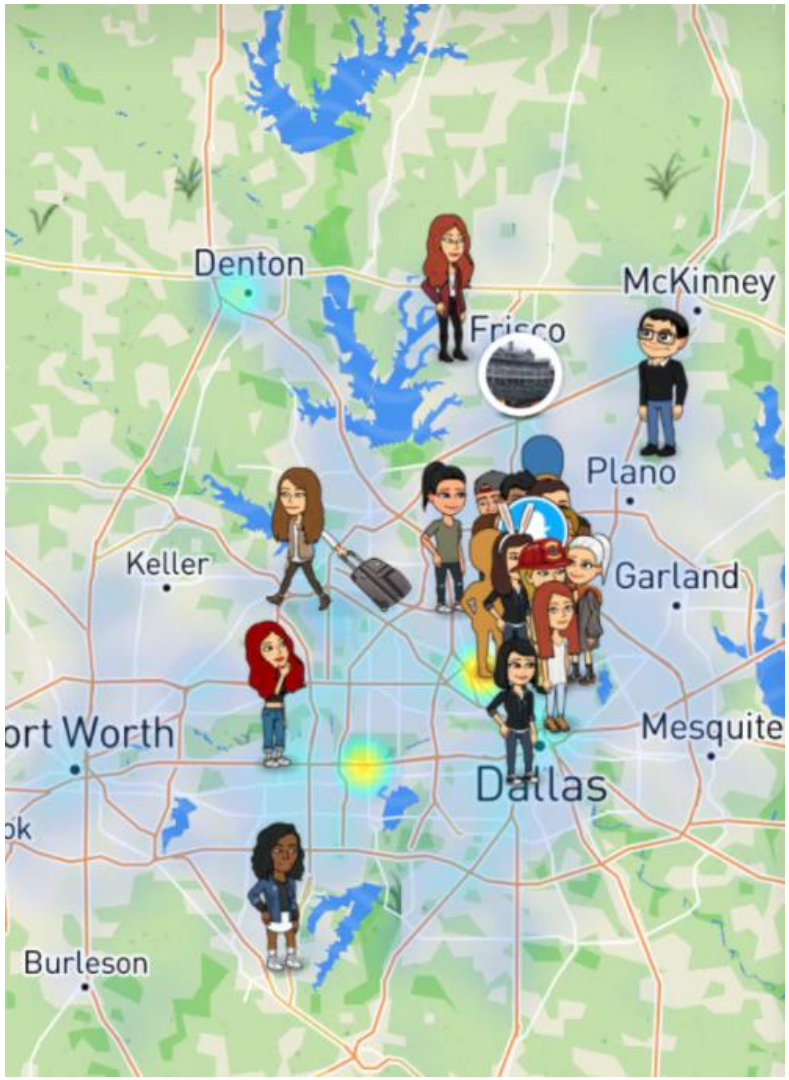
Thinking spatially…

- Google Maps/Earth
- Weather maps
- Movies/TV
- Video Games

What is GIS?

Thinking spatially…

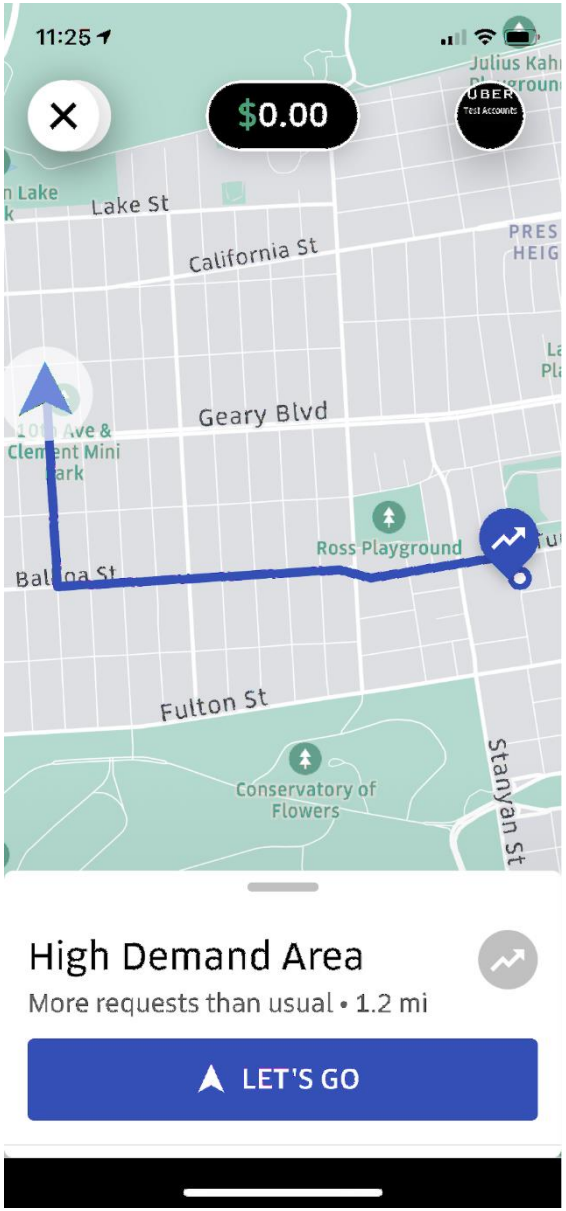
- Google Maps/Earth
- Weather maps
- Movies/TV
- Video Games
- Apps - Snapchat



What is GIS?

Thinking spatially…

- Google Maps/Earth
- Weather maps
- Movies/TV
- Video Games
- Apps – Uber

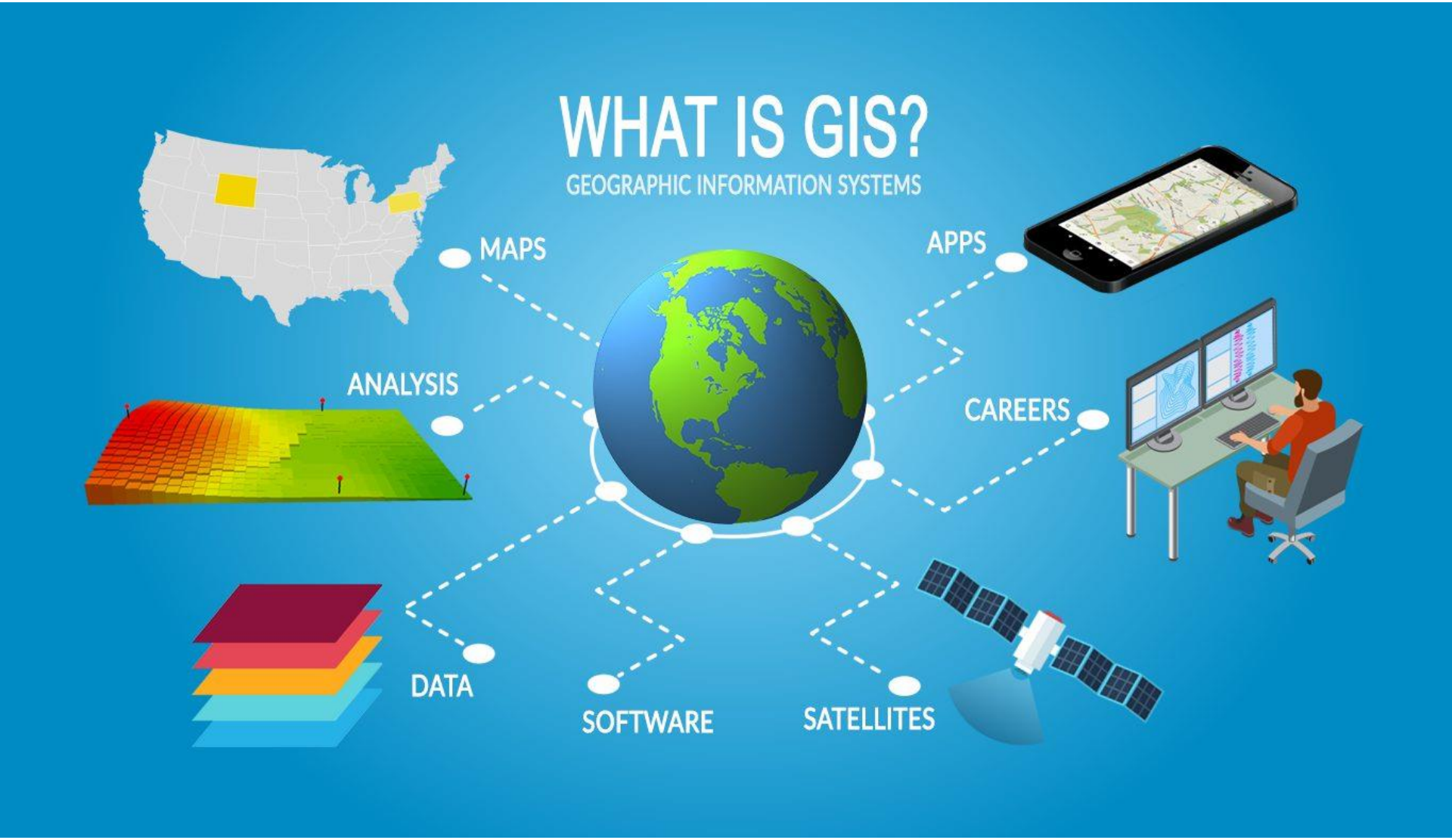


What is GIS?

Thinking spatially…

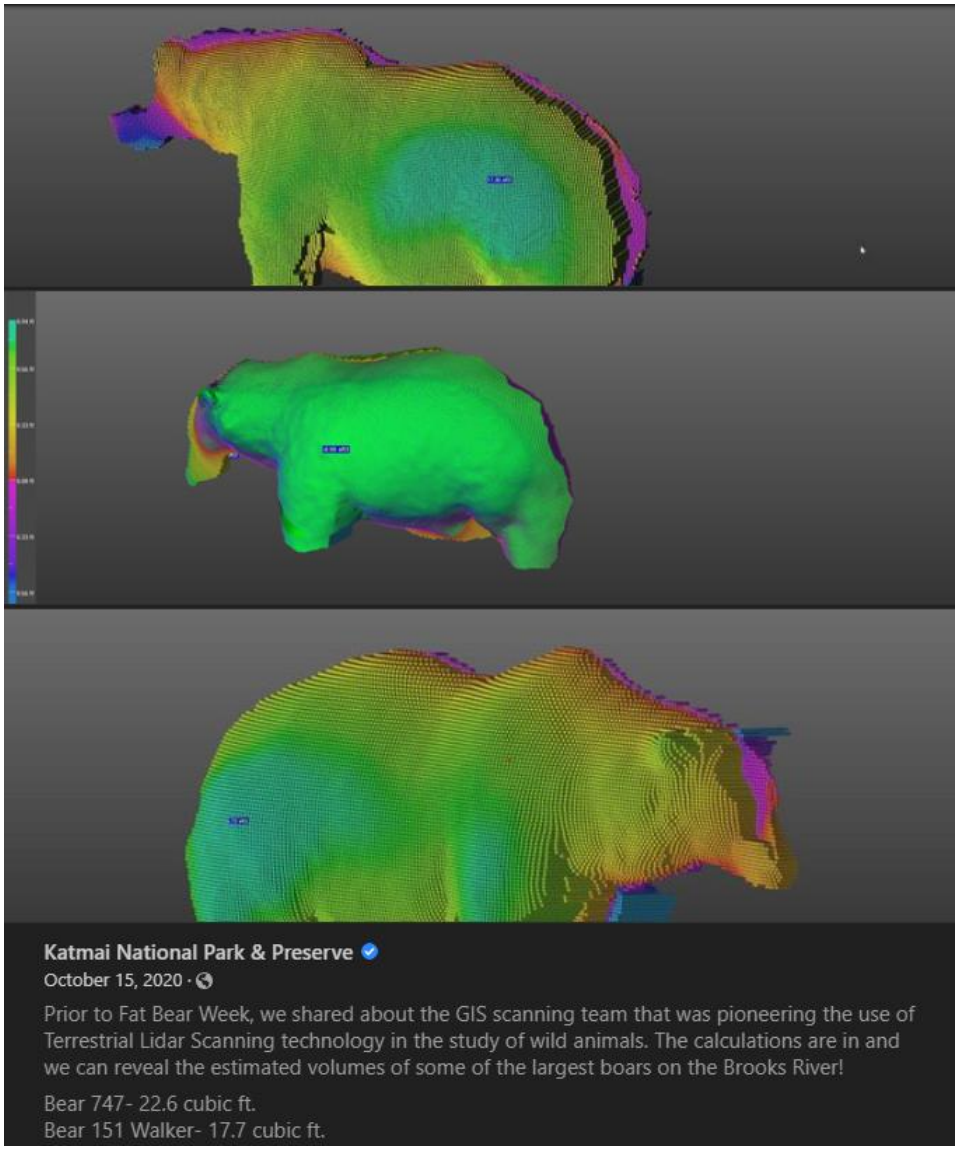
- **Emergency Response:** A 911 call came in for a person having a medical emergency. What is the fastest route to them? What is the shortest distance to the hospital?
- **National Parks:** Do wolves of one pack share the same habitat as wolves of another pack?
- **Public Health:** COVID-19 virus global outbreak begins around late 2019. To where is it spreading? Where is the highest number of cases?

What is GIS?


WHAT IS GIS?
GEOGRAPHIC INFORMATION SYSTEMS
MAPS
APPS
ANALYSIS
CAREERS
DATA
SOFTWARE
SATELLITES

What can you do with GIS?

- **Private/Corporate**
- **Public/Government**
  - Federal
    - -National Park Service
    - -NASA
    - -US Census Bureau
  - County
  - City
  - Town - Penfield
  - Town - Greece
- **Volunteering**
  - HOT
- **College!**



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Virtual GIST at MCC
https://atecentral.net/insites/MCC_GIST

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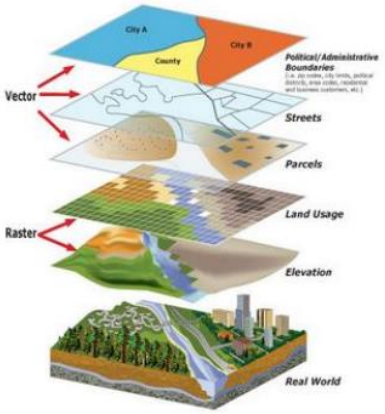
Earn your A.A.S. degree in GIST!

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.



Micro-Credential Courses**:
GEG 236 Geospatial Data Acquisition & Management
GEG 237 Web Mapping
GEG 238 Introduction to Geospatial Programming

GIS: Geographical Information Systems in which users can collect, manage, model analyze, and visualize data. This is a part of BIG data!

Remote Sensing: Using images taken from satellites, drones, and aircraft to analyze Earth's features over space and time. Very useful for looking at environmental issues.

GPS: Global Positioning Systems allows users to determine one's location. Smart phones have GPS receivers in them, as do airplanes, and tracking devices.

*2019 Bureau of Labor Statistics.

**Earn the 9 *credit GIST micro-credential as a stand-alone program, or as a part of the A.A.S. in GIST. MCC also offers a 24 credit GIST Certificate*

For more information: contact
Jonathon Little (jlittle@monroecc.edu) or Heather Pierce (hpierce@monroecc.edu)

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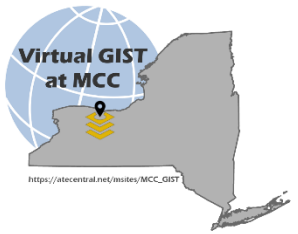

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Get the GIST! The Geospatial Information Science & Technology Certificate*

Availably completely online!

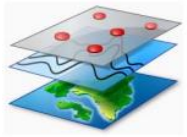
What do Geospatial Information Scientists and Technologists do?

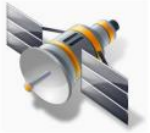
Geographic technologies, such as **Geographic Information Systems (GIS)**, **Remote Sensing**, **Global Positioning Systems (GPS)**, and **online mapping**, are increasingly important for understanding our complex world. Geospatial Information Scientists and Technologists research and develop geospatial technologies. They may produce databases, perform applications programming or coordinate projects. Many also specialize in areas such as agriculture, mining, health care, retail trade, urban planning, or military intelligence.

Job Outlook and Wages

Employment numbers are growing nationally at a rate of 15% per year and are anticipated to accelerate (U.S. Department of Labor). The US Department of Labor released a statement highlighting **geospatial technology as one of the most important emerging and evolving fields in the technology industry**.

As of 2024, normal pay for Geospatial Information Scientists and Technologists (e.g., remote sensing/cartographers) is **$86,510** per year (O NET online).



Two-Semester Sequence

Fall Semester:
Physical Geography Lab (GEG 100) – 1 cr.
Physical Geography (GEG 101) – 3 cr.
Digital Earth (GEG 130) – 3 cr.
Cartography (GEG 131) – 3 cr. (Fall only)
Intro to Remote Sensing (GEG 133) – 3 cr. (Fall only)

Spring Semester:
Human Geography (GEG 102) – 3 cr.
Spatial Analysis and GIS (GEG 230) – 3 cr. (Spring only)
Capstone Course in Geospatial Technology (GEG 239) – 2 cr. (Spring only)
Elective (e.g., GEG 237) – 3-4cr.

* All courses are available online!

For more information:
Jonathon Little (jlittle@monroecc.edu) or Heather Pierce (hpierce@monroecc.edu)

The GeoTech Consortium of Western New York was funded through the U.S. National Science Foundation (NSF) Office of Advanced Technological Education under Grants Award # 1501076 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.

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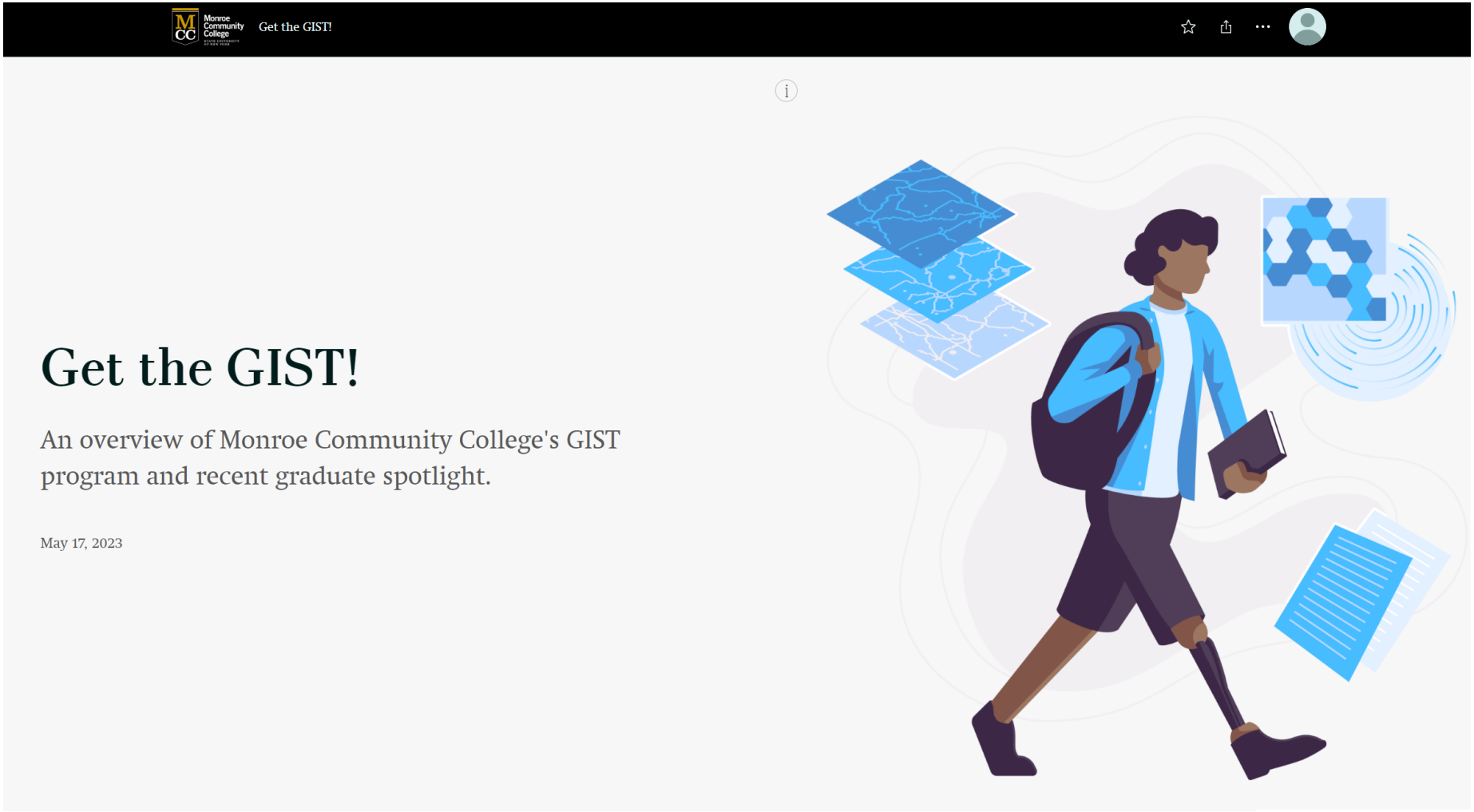
Virtual GIST at MCC
https://atecentral.net/msites/MCC_GIST



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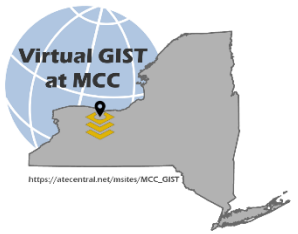
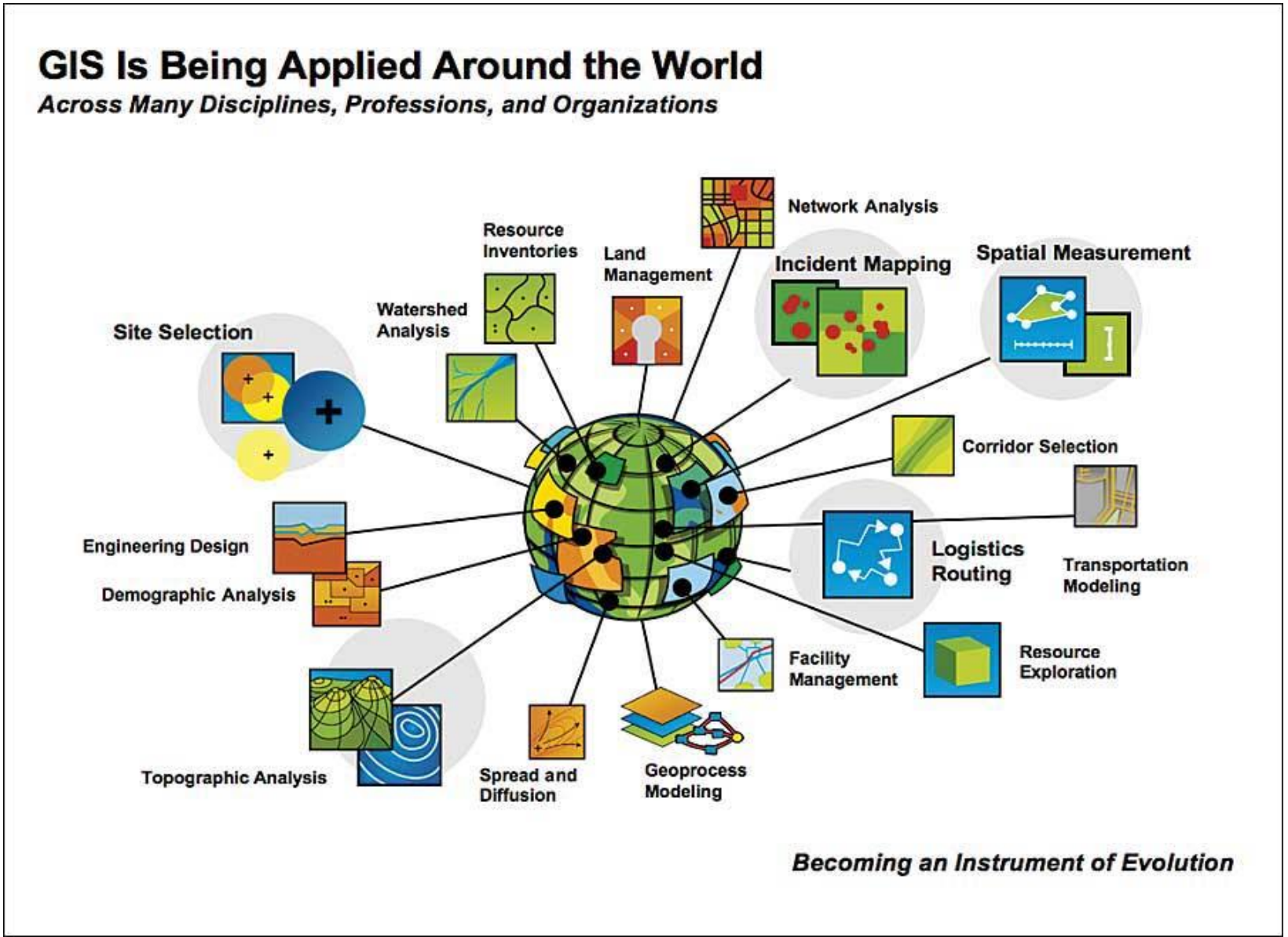
https://storymaps.arcgis.com/stories/16d98c5cd26e4b4baded9cb0fba70b4d



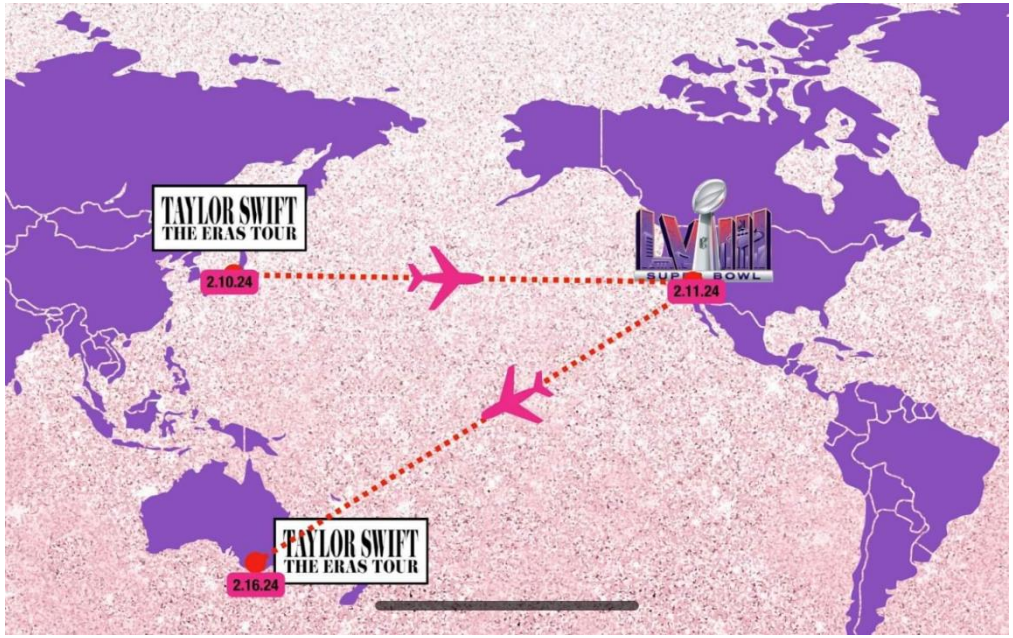
What can you do with GIS?



What can you do with GIS?

Have fun!

- Star Wars Film Locations Map
- Bigfoot Sightings Map
- The Beatles Concert Tours 1963-1966 Map
- Map of every shot Kobe Bryant took on the court in his career
- Mapping ingredients of your favorite salad



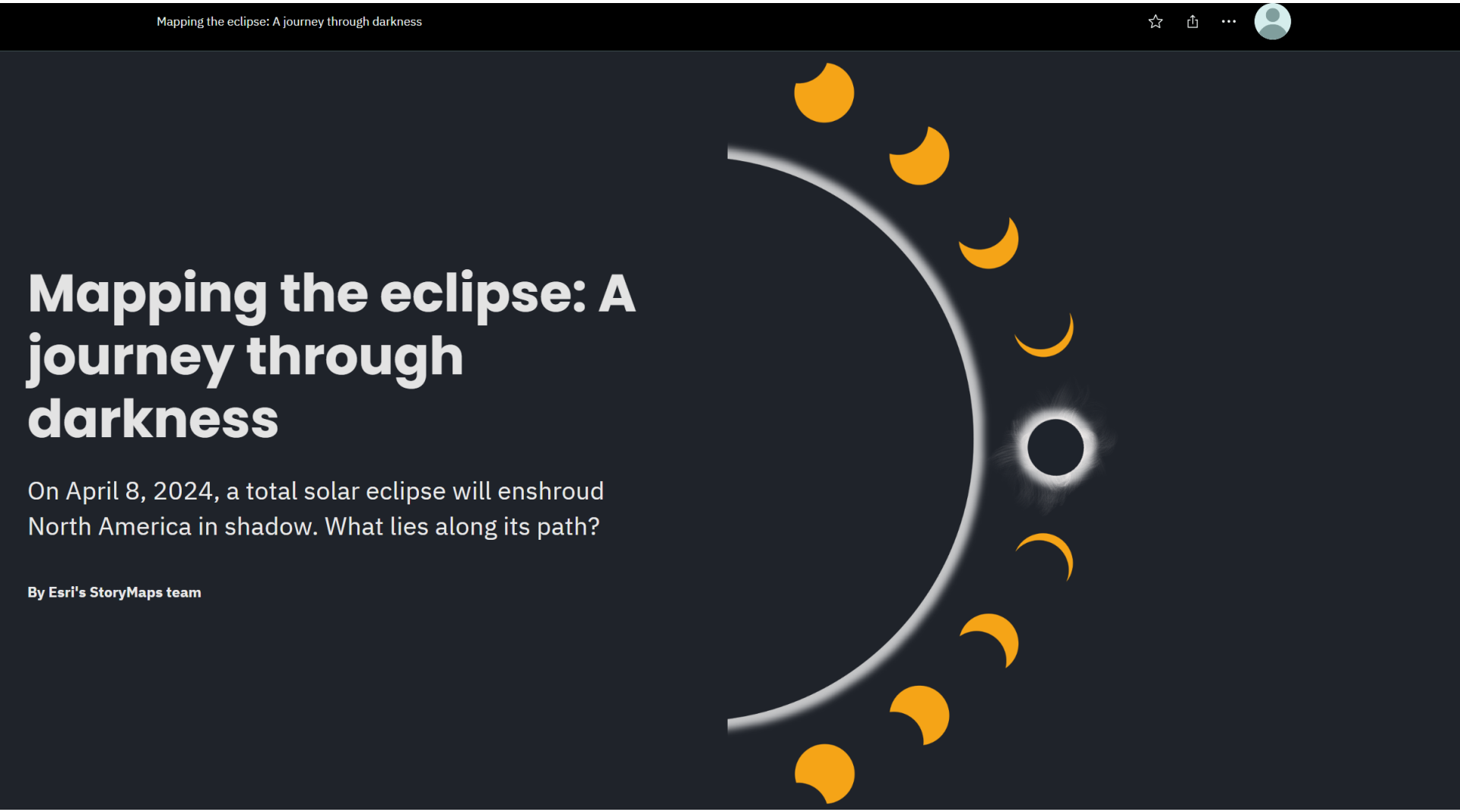
What can you do with GIS?

Have fun!

What can you do with GIS?

Have fun!

Mapping in the News: Web Maps & StoryMaps



https://storymaps.arcgis.com/stories/e7d0e4cef5044ecfaa54f44ac61de81e

Mapping in the News: Satellite Imagery

09_Overview of Mayfield consumer products candle factory and nearby buildings before tornado (Mayfield, Kentucky) 28jan2017

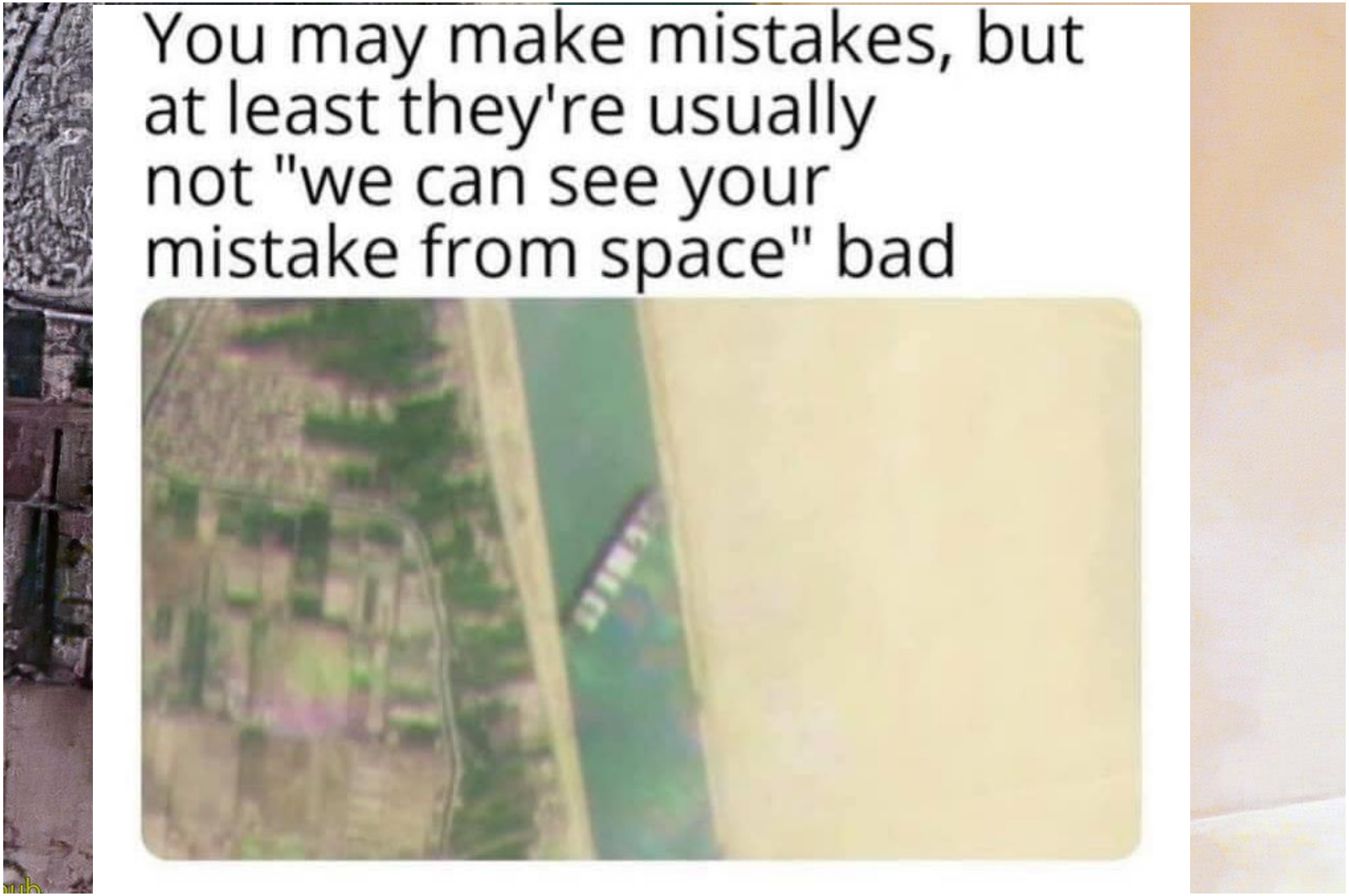
Satellite image ©2021 Maxar Technologies

10_Overview of Mayfield consumer products candle factory and nearby buildings after tornado (Mayfield, Kentucky) 11dec2021

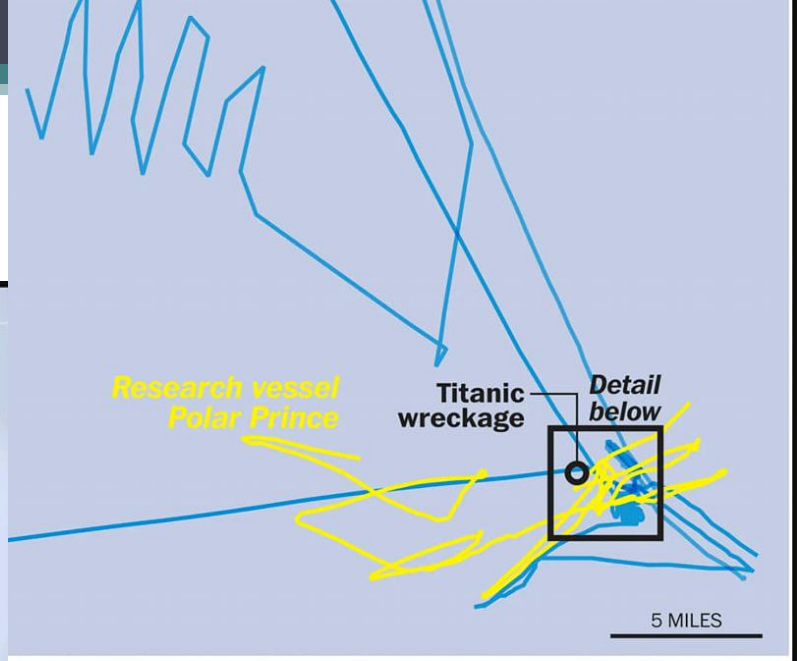
Image 10 of 14

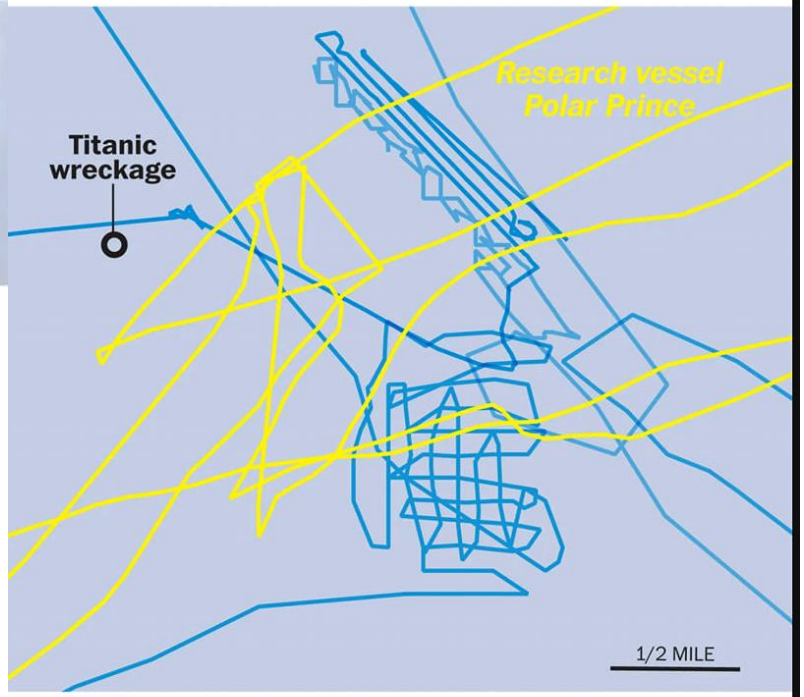
Satellite image ©2021 Maxar Technologies

Mapping in the News: Satellite Imagery



Mapping in the News





Data as of 10 a.m. Eastern on Wednesday.
Eight ships included in the mission are shown.
Sources: MarineTraffic, U.S. Coast Guard

Searching for the Titan submersible in 2023 – using GPS tracking to follow ship search patterns

Where has Geography/GIST taken me and where can it take you?

November 2013 – first Geography course at Geneseo

Summer 2014 – transportation planning internship, Boston

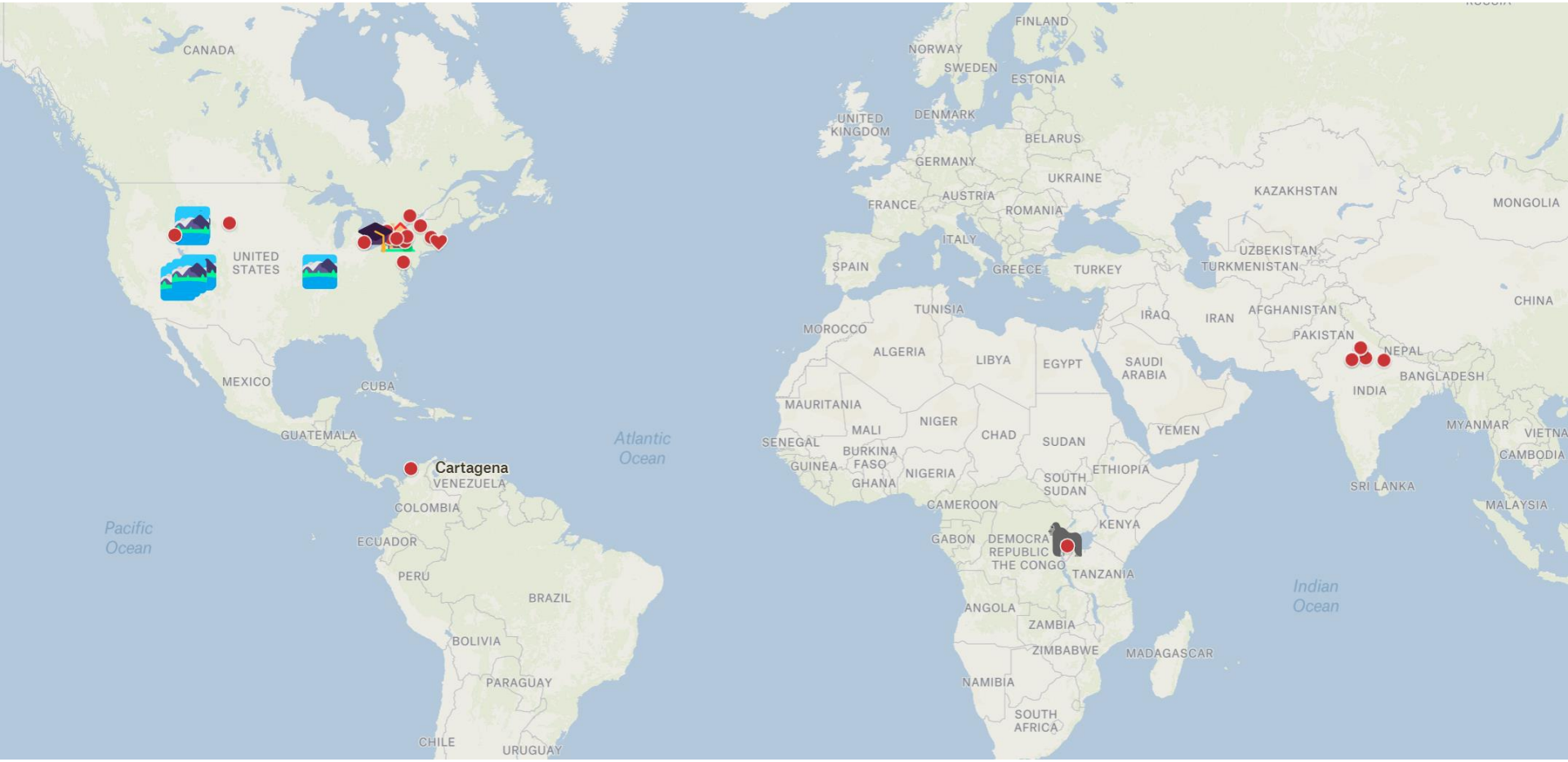
Fall 2014/Spring 2015 – planning/GIS internship, Geneseo

Fall 2015-2017 – grad school in Canada, geography

Work experience since moving back to Rochester in 2017:

- Regional Planning (government) – Downtown Rochester
- GIS Technician (government) – Town of Henrietta
- Project Manager (private/corporate) - Henrietta
- Junior Planner (government) – Town of Penfield
- GIS Consultant (private/corporate) – work from home
- Teaching – RIT
- Tutoring/teaching – MCC

Where has Geography/GIST taken me and where can it take you?



Thank you and MCC Contacts

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