

Mar 24th, 10:00 AM - 11:30 AM

# An Introduction to Using Geographic Information Systems (GIS) in the Classroom

Lisa K. Millsaps

University of Northern Iowa, [lisa.millsaps@uni.edu](mailto:lisa.millsaps@uni.edu)

Follow this and additional works at: <https://digitalcommons.georgiasouthern.edu/stem>



Part of the [Science and Mathematics Education Commons](#)

---

## Recommended Citation

Millsaps, Lisa K., "An Introduction to Using Geographic Information Systems (GIS) in the Classroom" (2018). *Interdisciplinary STEM Teaching & Learning Conference*. 11.

<https://digitalcommons.georgiasouthern.edu/stem/2018/2018/11>

This event is brought to you for free and open access by the Conferences & Events at Digital Commons@Georgia Southern. It has been accepted for inclusion in Interdisciplinary STEM Teaching & Learning Conference by an authorized administrator of Digital Commons@Georgia Southern. For more information, please contact [digitalcommons@georgiasouthern.edu](mailto:digitalcommons@georgiasouthern.edu).

# An Introduction to Using Geographic Information Systems (GIS) in the Classroom

Lisa Millsaps

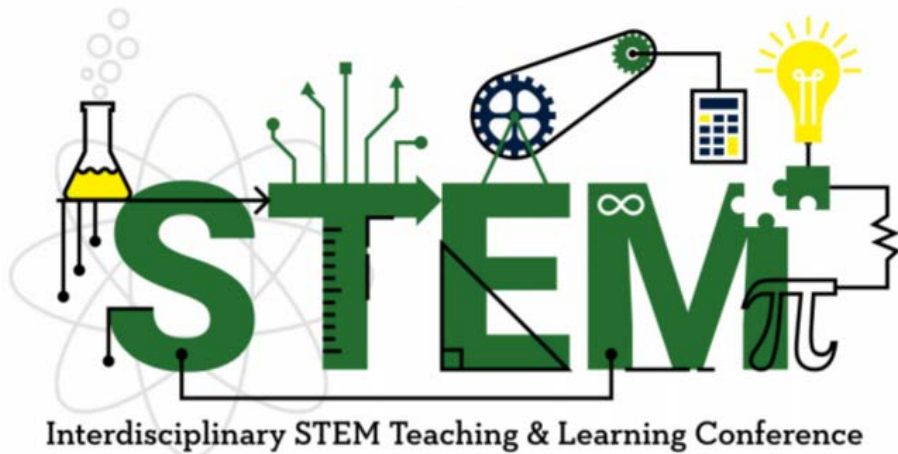
David Jensen

University of Northern Iowa

2018 Interdisciplinary STEM Teaching and Learning Conference

# Welcome

- Good morning!
- Introductions – us and you 😊



# Agenda

	<b>Welcome!</b>
<b>10:00</b>	Agenda , introductions, and overview
<b>10:10</b>	Teaching with maps and GIS
<b>10:20</b>	Story Maps
<b>10:40</b>	GeoInquiries
<b>11:00</b>	ArcGIS Online
<b>11:20</b>	Wrap-up and final questions

# Goals for today

- To familiarize you with available online GIS programs to be used in your classroom or educational setting
- Give you the time and assistance to (hopefully) find something you can readily go out and use in your classroom or educational setting
- Spark new interests for using maps in STEM

# Building the Case for GIS and Mapping

# The Power of Maps

- <http://twistedrifter.com/2013/08/maps-that-will-help-you-make-sense-of-the-world/>
- Go to this website, look at the maps, and take 5 minutes discussing with your neighbor the most fascinating maps



**You had one job!**  
**One job!**

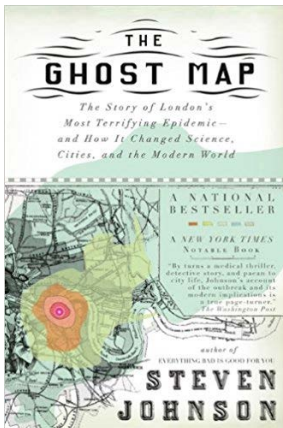
# Benefits of using maps and GIS in your classroom...

- Supports integrated teaching of multiple subjects
- Assists with the use of dual-encoding
- Works well with inquiry-based activities
  - Incorporates well with the STEM and technology movements
- Presents a significant amount of content in a geographical context
- Contemporary technology that introduces students to an in-demand job skill

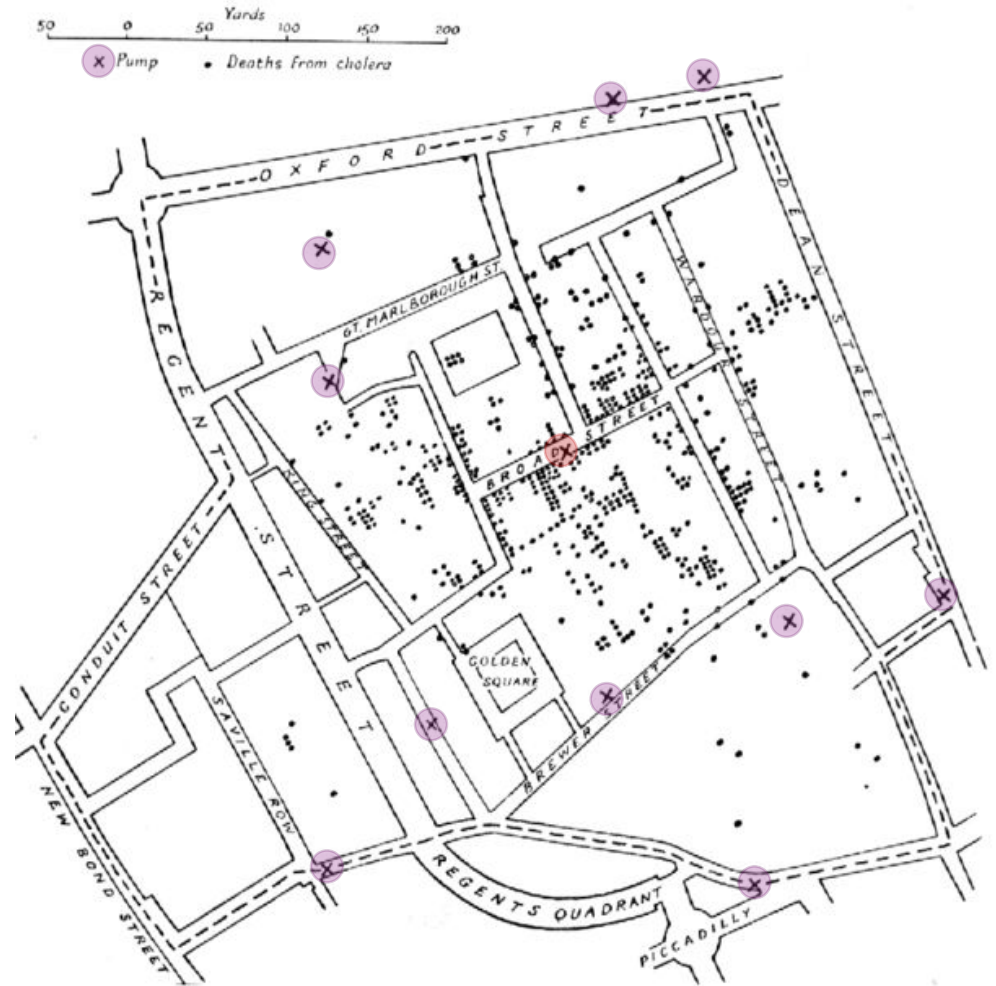


# Geographic Information Systems (GIS)

- any **information system** capable of integrating, storing, editing, sharing, analyzing, and displaying **geographically referenced information**



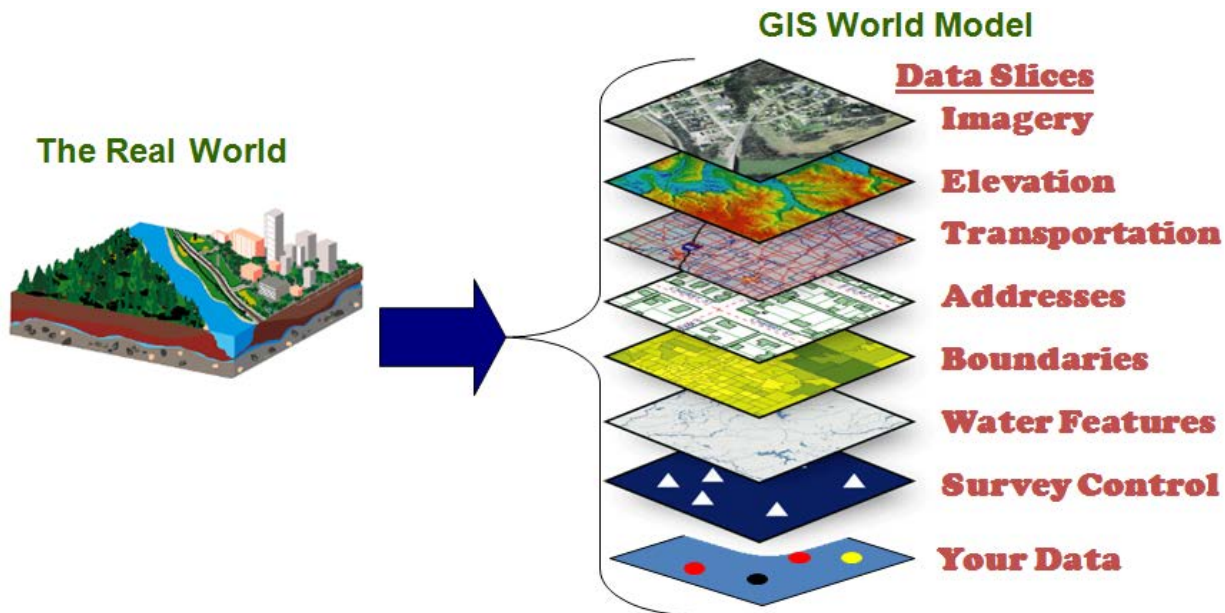
The Ghost Map  
by Steven Johnson



John Snow's 1855 map of the Soho cholera outbreak showing the clusters of cholera cases in the London epidemic of 1854

# What makes GIS unique?

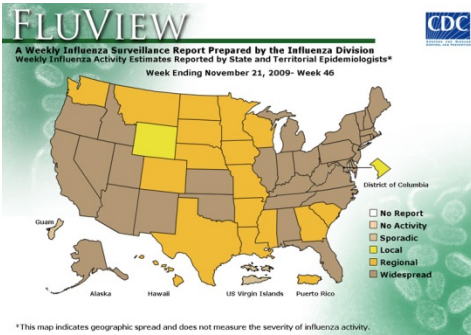
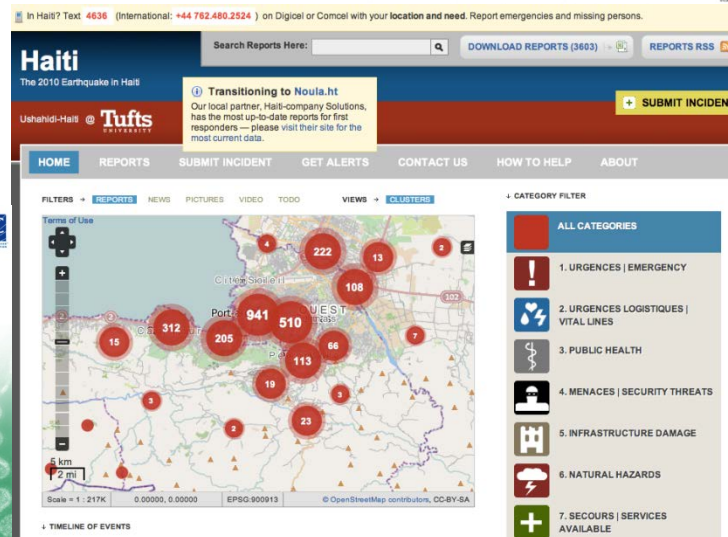
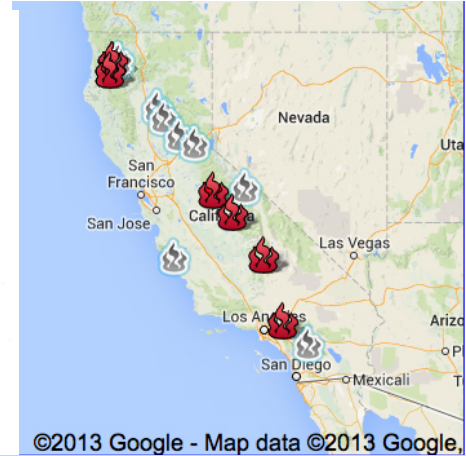
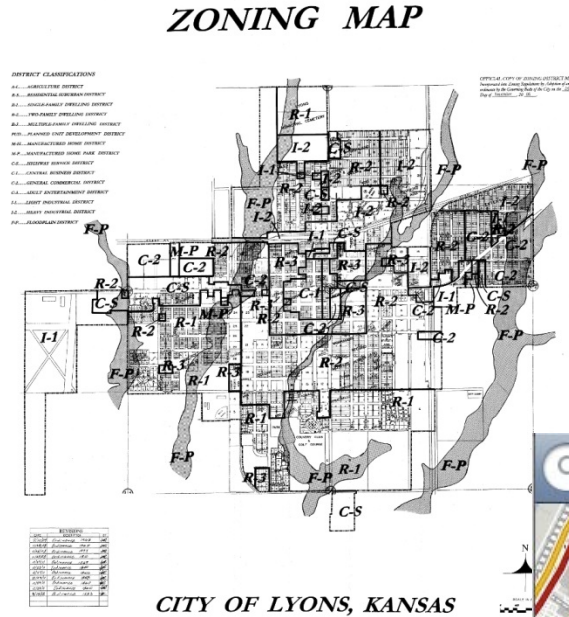
- Use of layered data
- Stacking or breaking apart of the whole



# GIS in the World Around Us

- Mapping
- Planning and zoning
- Disaster relief
- Route planning
- Crime analysis
- Health

STEM!!!



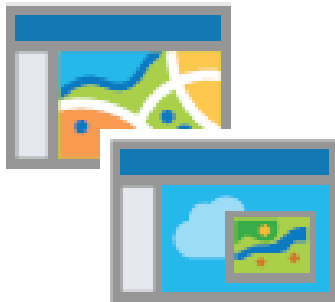
# Core Elements of GIS



Create Geographic Data



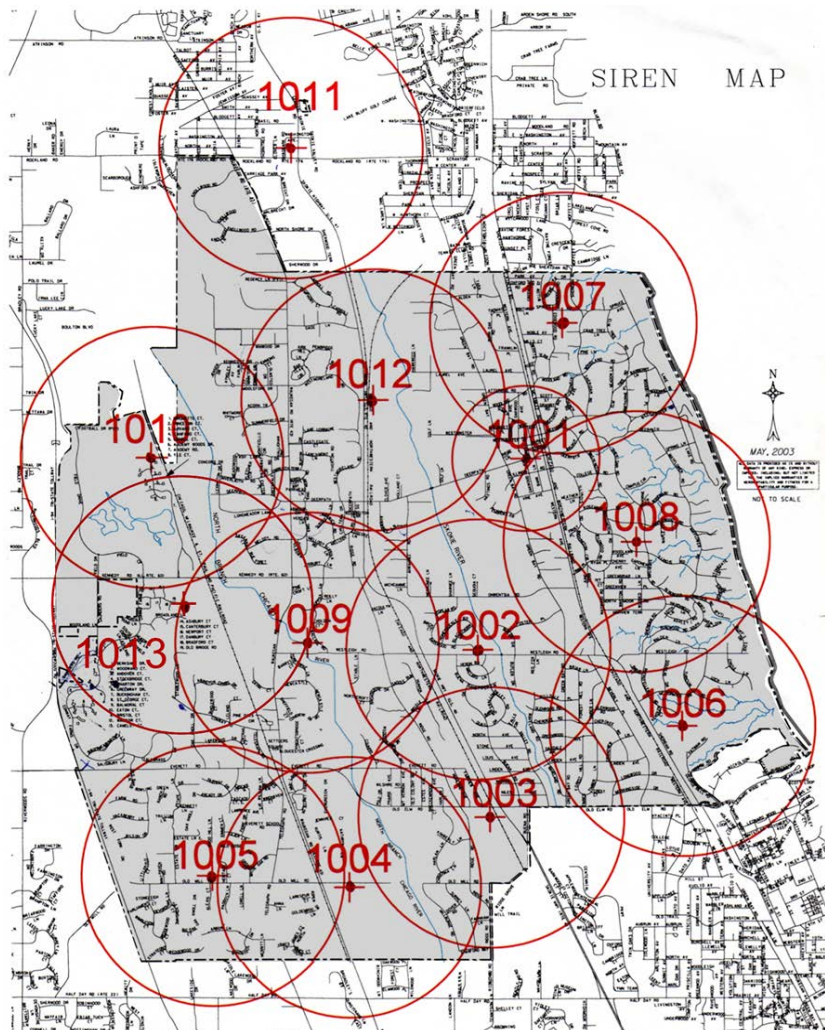
Analyze Data Spatially



Represent Data

# How Can I Use GIS in My Classroom?

## Tornado Siren Coverage in Lake Forest, IL



- Examples of projects that can use GIS:
  - Demographics information for countries of the world
  - Visualization of historic events
  - Natural change over time
  - Earthquake and volcano location
  - Travel routes
  - Locations of a books plot
  - Explore the location and spread of disease/illness
  - Community projects and involvement

# Multiple GIS Options



- Story Maps – premade, focused on exploration, narrative, and patterns
- GeoInquiries – premade, actual activities
- ArcGIS Online - free reign use of the tool
  
- National Geographic MapMaker
  
- Google Earth
- Google Maps
  
- EdGIS

# Story Maps (literally maps that tell a story)

Story Maps ▾ Apps Gallery Resources Blog My Stories

Sign In

English ▾



## Story Maps

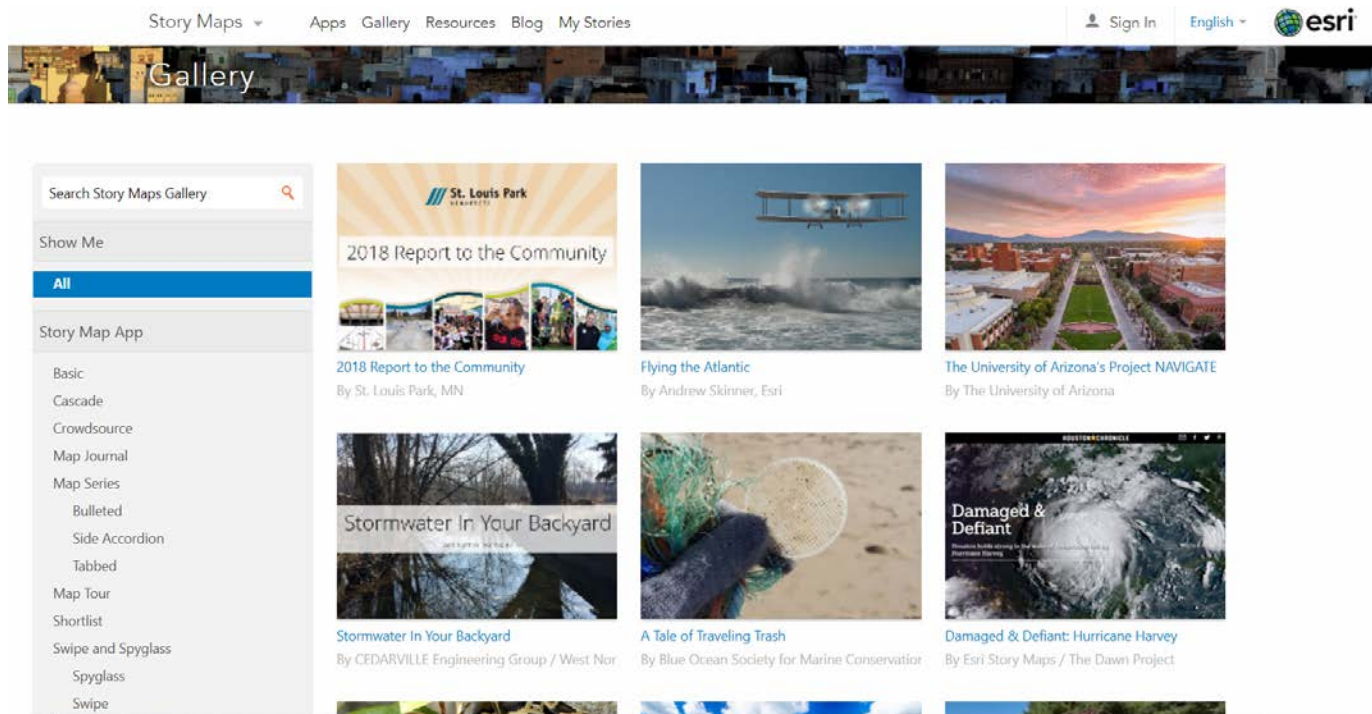
Everyone has a story to tell.  
Harness the power of maps to tell yours.

photo: Lokankara/CC-BY-SA 3.0

Get the latest Story Maps news delivered directly to you. Sign up today.

[www.esri.com/storymaps](http://www.esri.com/storymaps)

# Story Map Task



- Explore the gallery
  - Scrolling
  - Search bar
  - By story map type
- Find at least one map that you could use and plan to share which map and why



Reaction to Story Maps and the most useful  
maps you found





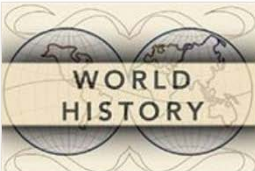



- Used to integrate ArcGIS Online technology to support subject matter content teaching.
- Lessons include learning objectives, technical “how-to’s”, textbook references, and formative whole-class assessment items – all packed into one page.
- These activities can be delivered in a classroom with as little as a tablet and a projector.
- Any teacher can use a Geolnquiry, regardless of their prior experience with digital mapping tools.

# Geolnquiries

Geolnquiries are short, standards-based inquiry activities for teaching map-based concepts found in commonly used textbooks.

Latest Content

[View All Group Content](#)

 <p>U.S. HISTORY</p> <p>Esri Geolnquiries™ collecti... by Geolnquiries</p> <p>Created: Feb 8, 2016 Updated: Sep 5, 2017 View Count: 503</p>	 <p>ELEMENTARY</p> <p>Esri Geolnquiries™ collecti... by Geolnquiries</p> <p>Created: Jun 16, 2016 Updated: Sep 5, 2017 View Count: 513</p>	 <p>MATH</p> <p>Esri Geolnquiries™ collecti... by Geolnquiries</p> <p>Created: Apr 7, 2017 Updated: Sep 5, 2017 View Count: 263</p>	 <p>AMERICAN LITERATURE</p> <p>Esri Geolnquiries™ collecti... by Geolnquiries</p> <p>Created: Apr 11, 2017 Updated: Sep 5, 2017 View Count: 225</p>
 <p>WORLD HISTORY</p> <p>Esri Geolnquiries™ collecti... by Geolnquiries</p> <p>Created: Apr 27, 2017 Updated: Sep 5, 2017 View Count: 207</p>	 <p>EARTH</p> <p>Esri Geolnquiries™ collecti... by Geolnquiries</p> <p>Created: Feb 8, 2016 Updated: Sep 5, 2017 View Count: 1,106</p>	 <p>HUMAN GEOGRAPHY</p> <p>Esri Geolnquiries™ collecti... by Geolnquiries</p> <p>Created: Feb 8, 2016 Updated: Sep 5, 2017 View Count: 794</p>	 <p>ADVANCED ENVIRONMENTAL SCIENCE</p> <p>Esri Geolnquiries™ collecti... by Geolnquiries</p> <p>Created: Jun 16, 2016 Updated: Sep 5, 2017 View Count: 855</p>

# GeoInquiries

Home Gallery Map Scene Groups

Sign In



## Esri GeoInquiries™ for schools

Overview

Content

Members



[www.esri.com/GeoInquiries](http://www.esri.com/GeoInquiries) - GeoInquiries are short, standards-based inquiry activities for teaching map-based concepts found in commonly used textbooks.

owned by [GeoInquiries](#)

### Description

Since 2014, GeoInquiries™ have been used to integrate ArcGIS Online technology to support subject matter content teaching. Lessons include learning objectives, technical “how-to’s”, textbook references, and formative whole-class assessment items - all packed into one page. These activities are technology agnostic and can be delivered in a classroom with as little as a tablet and a projector. Any teacher can use a GeoInquiry, regardless of their prior experience with digital mapping tools.

For questions or concerns, email [geoinquiries@esri.com](mailto:geoinquiries@esri.com).

### Latest Content

View All Group Content



Share

### Details

Created: February 8, 2016

Viewable by: **Everyone (public)**

Contributors: **Members**

2 11



### Owner



GeoInquiries

### Tags

[GeoInquiries](#), [ConnectEd](#), [GeoInquiry](#), [APHG](#), [Earth systems](#), [school](#), [APES](#), [US History](#)

- [www.esri.com/GeoInquiries](http://www.esri.com/GeoInquiries)
- Explore the geoinquiries
- Find at least one geoinquiry that you could use and plan to share which one and why

Reaction to Geoinquiries and the most useful  
Geoinquiries you found

# ArcGIS Online

- Online mapping program
- Create interactive web maps using provided data or your own data
- Share maps on the internet
- Access content shared by other users
- There are thousands of premade maps and data layers ready for you to use



But first, a quick demo...

# ArcGIS Online

ArcGIS Features Plans Gallery Map Scene Help

Sign In



# ArcGIS



Country Population Estimates, 2015, from



Crime Rate Comparison Map



Seismic Seafloor Feature Anomalies



Southern Pine Beetle Prevention Program

## ✓ Sign-up now

Get a free ArcGIS Online account and start making web maps today.

## 🗺 Make a Map

Create a map that can be viewed in a browser, desktop or mobile device. Share it on a blog, via email, or embed it in a website.

## 👨‍💻 ArcGIS for Developers

Build custom web and mobile applications that incorporate your maps and data.

## 🎓 Discover Lessons

Take hands-on lessons based on real-world problems.

[www.arcgis.com/home](http://www.arcgis.com/home) Complete self-exploration 5x5 activity

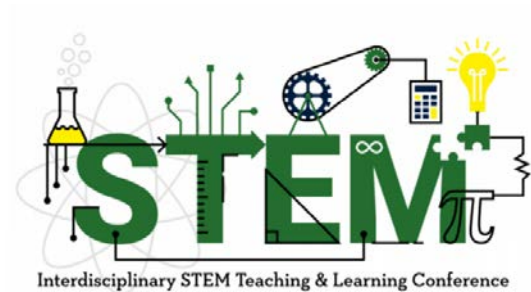
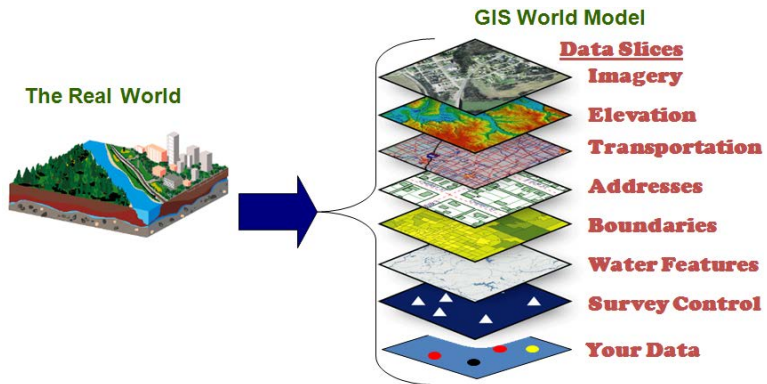
# Reaction to the 5 x 5 Activities



Can you visualize yourself using GIS in your classroom or education setting? How so?  
Share with us!

# Final Questions?

## Thank you!



Lisa Millsaps

[lisa.millsaps@uni.edu](mailto:lisa.millsaps@uni.edu)

David Jensen

[jensedae@uni.edu](mailto:jensedae@uni.edu)