

Meet US Geological Survey Geographer



Erin Korris

Erin Korris is a Geographer at the US Geological Survey. She works within the National Geospatial Technical Operations Center (NGTOC), which is responsible for *The National Map* and the US Topo map series. Erin has worked on a variety of projects, currently focusing on the volunteer mapping program, *The National Map Corps (TNMCorps)*. She does a variety of work for *TNMCorps* including: outreach and education, data processing, writing documentation, data quality assurance, among other things. She recently traveled to 4-H headquarters in Chevy Chase, Maryland to teach a class on *TNMCorps* at the Youth Summit on Geospatial Technology.

Erin received a B.A. in Geography with a concentration in Environmental Studies and a certificate in Geographic Information Science (GIS) from the University of Colorado Denver. She began working at the USGS as a temporary student employee while pursuing her undergraduate degree. After graduating in the fall of 2010 she began working full-time at the USGS. Working on an innovative crowdsourcing project like *TNMCorps* allowed her to learn many new skills related to geographic data collection and project management. She enjoys the opportunity to present *TNMCorps* at conferences and events such as the 4-H Youth Summit.

When Erin isn't recruiting amateur geographers and processing geographic data she likes to spend time with her husband, dog and cat. Originally from Kansas City, she loves living in Denver and exploring the city, especially checking out new local restaurants and going to concerts.

STEM Connections

Colorado State University

Extension



Connecting Science, Technology, Engineering, and Math concepts to our everyday lives.

ProblemsLayers Part 2

Let's Talk Trash Analysis

Activity taken directly from NYSD Maps and Apps

The activity this month is the original proposal the Colorado team (lead by Claire Dixon and Christy Fitzpatrick) sent to National 4-H. It became the 2nd activity in the 2013 National Youth Science Day Maps and Apps activity.

In the last mapping activity, *ProblemsLayers: Let's Talk Trash*, we learned about how modern maps are made in different layers. This month, we will analyze those layers to determine how we can reduce the trash found throughout Sterling, CO.

Remember, from the activity, you made a map based on the following information:

The mayor in the City of Sterling, Colorado has asked for your expertise to help resolve a messy situation. In this city, the middle school, high school, recreation center, and fairgrounds are all located close together. Whether it's the county fair, a Friday night football game, or a special community event, this area sees a lot of traffic—and a lot of trash. The city has already picked up the trash and recorded where everything was using a grid. To help reduce the amount of trash this area sees in the future, the mayor would like to install recycling and trash receptacles throughout the area and wants your help in determine the best location for them.

EXPLORE IT - DESIGN IT - DO IT

Modern mapping terminology uses words to describe attributes of different features. Common terms include **point feature**, **line feature**, and **polygon feature**. A **point feature** is something represented by a single point, for example a house or trash or trash receptacle. A **line feature** represents things like roads and rivers. A **polygon feature** represents things like fields, lakes, or buildings.

- From last STEM Connection, you made a 4 layer map with the base layer as Sterling, Colorado.
 - "Layer 1: Plastic Bottles."
 - "Layer 2: Aluminum Cans."
 - "Layer 3: Paper Goods."
 - "Layer 4: Non-Recyclable"
- If you didn't last time, cut your page protector apart into the 4 sections, order each layer on top of the base map, and clip them together with the binder clip.
- Look carefully at the map and the layers. You may need to shift the layers a bit to have them align properly. For example, if you have a plastic bottle in the middle of a building, you need to shift that layer a bit to align everything properly.
- **Analyze your data:** Look carefully at your map. What observations can you make about the locations of the trash?
 - What areas seem to accumulate the most trash? Why do you think this happens?
 - How do different factors such as precipitation and wind impact where and how trash collects?
 - This section of Sterling does not have any waterways, but think about an area that does have a waterway running through it. How might trash that collects near waterways enter the water and flow downstream? What impacts could that trash have on reservoirs, major tributaries, and ultimately the ocean?
- Clean it up! Place a new transparency on top of your layered map. From your analysis, did you make some determinations about possible source of the trash? Where would you place trash receptacles? Use **red for plastic receptacle**, **blue for aluminum can receptacle**, **green for Paper Goods receptacle**, and **black for trash cans**.
- How would you present these findings to the mayor?

Age Appropriate:
4th—HS grades

Time Required:
About 45 minutes

Materials:

- Transparent page protector
- **Red**, **blue**, **green** and black sharpie pens
- Base map and 4 layers you made from the prior STEM Connection, held together with binder clips

The Set-up:

- Collect all your materials
- Fold page protector in half

The Clean-up:

- Put away pens and binder clips
- Dispose of the map

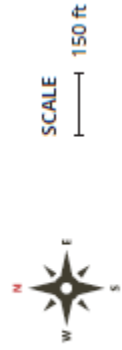
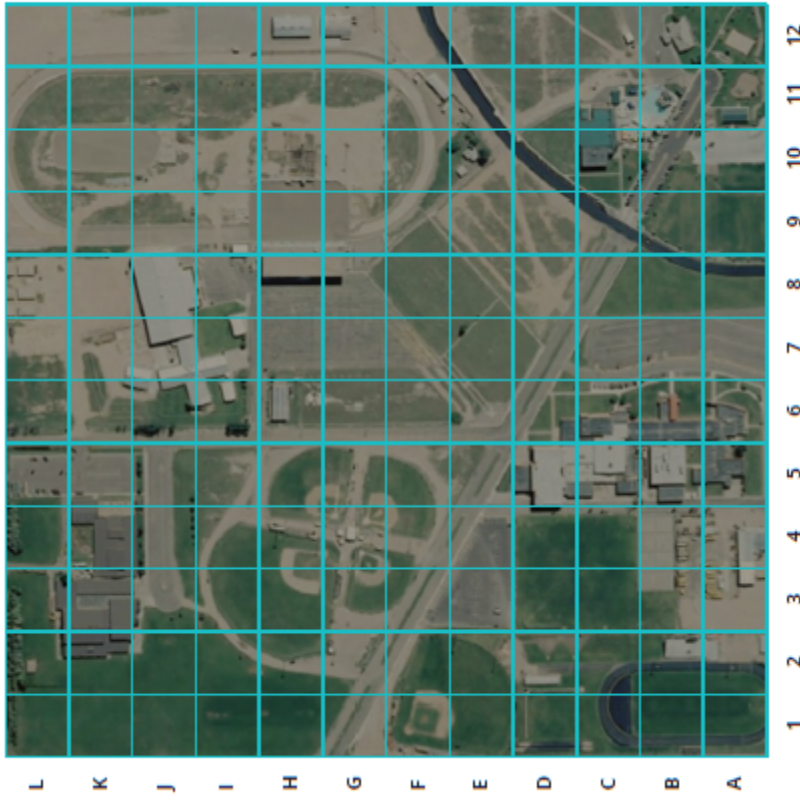
Power Words

- **analyze:** examine in order to explain or interpret
- **data:** factual information, especially information organized for analysis or used to reason or make decisions
- **feature*:** a representation of a real-world object
- **line feature*:** a map feature that has length but not area at a given scale, such as a river on a world map or a street on a city map
- **point feature*:** a map feature that has neither width nor length at a given scale, such as a city on a world map or a receptacle on a city map
- **polygon feature*:** a map feature that has both length and area at a given scale, such as country on a world map or a football field on a city map

* Definitions from NYSD 2013 Maps and Apps Youth Guide Glossary



BASE MAP OF STERLING, COLORADO



Layer _____:

TRASH DATA CHARTS

Layer 1: Plastic Bottles

	Y Coordinate	X Coordinate	# of Bottles
1	B	2	2
2	B	10	3
3	C	6	4
4	C	10	2
5	G	4	7
6	H	4	1
7	I	6	4
8	J	3	6
9	J	4	12
10	J	5	4

Layer 2: Aluminum Cans

	Y Coordinate	X Coordinate	# of Cans
1	A	10	2
2	B	2	3
3	F	1	3
4	G	4	7
5	H	7	3
6	H	8	10
7	I	8	3
8	J	3	4
9	J	4	3
10	J	5	2

Layer 3: Paper Goods

	Y Coordinate	X Coordinate	# of Paper Items
1	A	7	3
2	B	7	6
3	C	7	4
4	C	10	3
5	H	8	2
6	I	8	2
7	J	3	5
8	J	4	6
9	J	5	3
10	K	5	2

Layer 4: Non-Recyclable Trash

	Y Coordinate	X Coordinate	# of Items
1	C	6	3
2	F	5	5
3	G	5	7
4	H	5	8
5	I	11	5
6	J	3	1
7	J	4	2
8	J	5	1
9	J	11	4
10	K	11	5