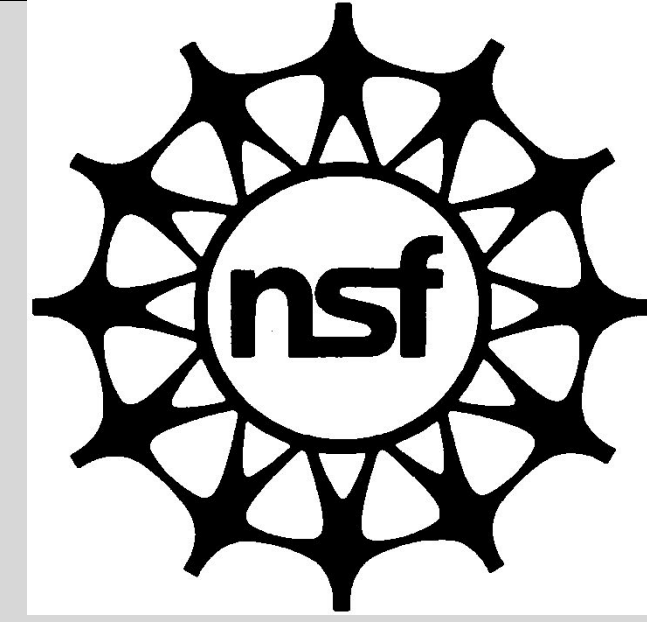


Geography Information Systems and Crime Analysis: How does technology help fight crime?

Angel Moses
East Community High School



BUFFALO STATE
The State University of New York

Abstract

This project will expose students to Geographic information systems (GIS) and their potential use in crime reduction. GIS is computerized mapping or a system designed to capture, store, manipulate, analyze, manage, and present geographic data. [1] It helps us to answer the who, what, why, when, where, and how. Students will explore GIS applications such as google earth, and sketch up to grasp the concept of computerized mapping as it relates to crime analysis. Students will use ArcGIS software to create a story map, explore and create grouping, and to illustrate areas of heavy criminal concentration.



Students will also analyze data such as per capita income, education and housing in efforts to compare and contrast relationships between socio-economic factors and crime causation. Students will use data to develop a story map of their findings. The project will culminate with a field trip to Erie County Crime Analysis Lab.

Introduction

People use geographic information systems everyday. This technology has become so common place that we don't really consider the fact that we are using it, we just simply use it. We pick up our cellphones to locate directions, and we turn on the television to get weather predictions; yet most people, including myself, prior to being involved with GIS camp, would say that they don't use GIS in their every day lives. GIS crime mapping applications have become widespread and almost commonplace in law enforcement agencies nationwide as well as worldwide. "Probably one of the most invaluable tools available for effective crime fighting is information. [2] Knowing when and where a crime is likely to occur helps police plan where to allocate their resources at different times of the day". [3] This technology is not only being used to map crimes that have been committed, but also to predict future crimes and apprehend criminals before the criminal activity has been carried out. The goal of this project is to allow students to explore the developments in geographic mapping of crimes.



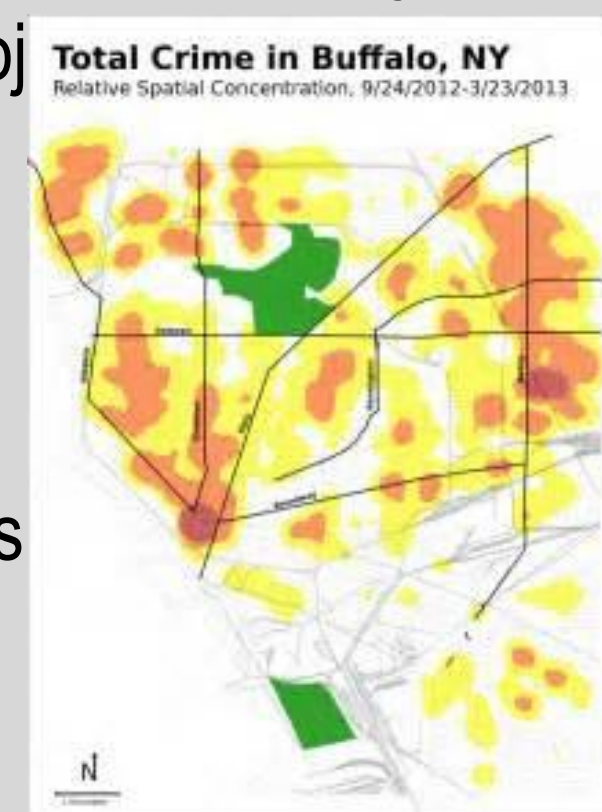
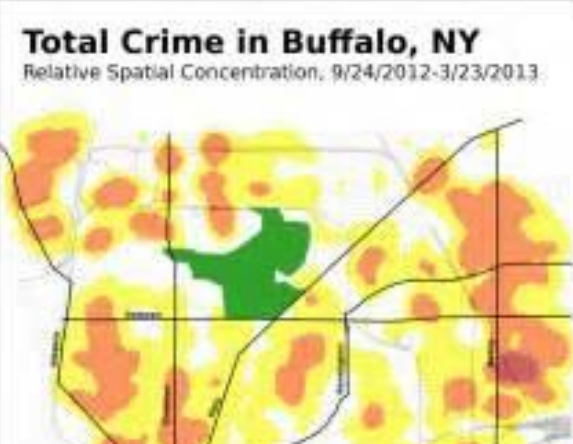
Figure 1: Topography of San Francisco if elevation represented crime [4].

Teaching Implementation/Student Learning Goals

Over the course of a four week GIS summer camp, teachers learned to use ArcGIS software to plot data, and perform analysis to examine how factors such as income, education, housing, employment etcetera relates to other data such as location of contaminates. In addition, teachers developed their own story maps with ArcGIS software. I chose to use my map as a template/example for students to analyze and use to produce their own maps.

Students will be given approximately eight slides within a story map to analyze and make inferences on crime rates in Buffalo, NY. Furthermore, students will perform an analysis to determine the relationship between crime and various socio-economic factors such as level of education to draw their own inferences. Crime analysis has many facets and can become very complex depending on what crime is being examined and usage of the data. This project

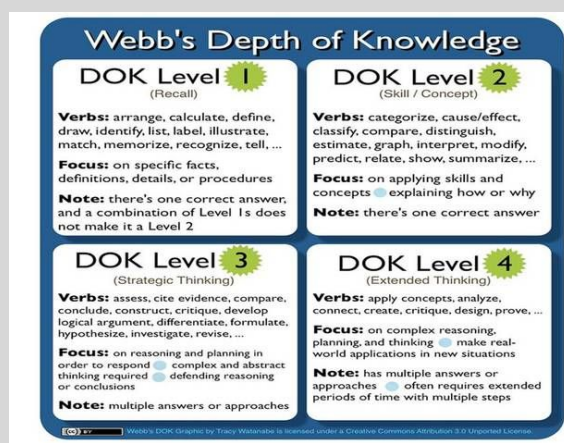
1. Analyze one feature of violent crime (homicides) to obtain a basic understanding of the role of GIS in law enforcement.



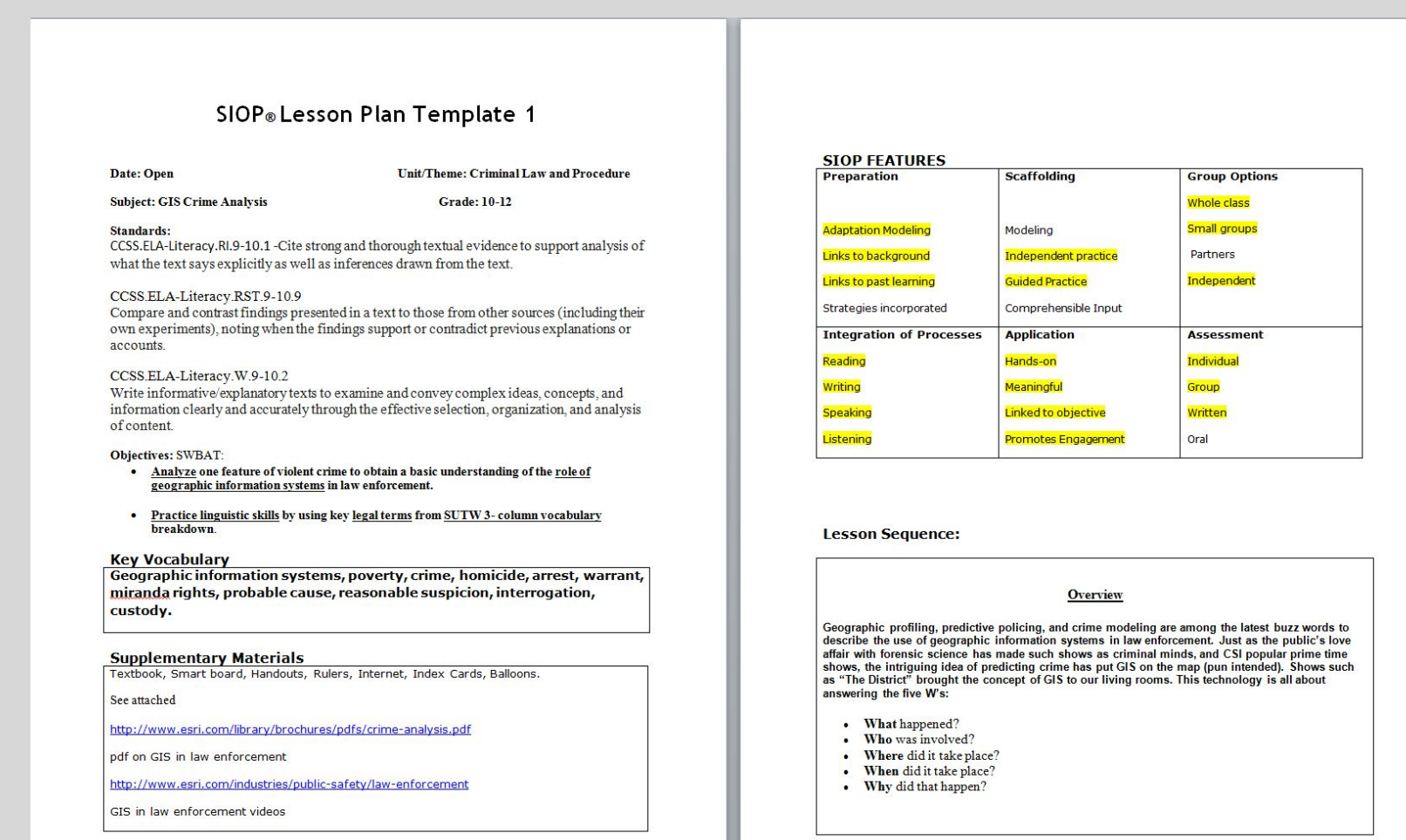
Teaching Implementation / Student Learning and Terminology

This project will be a good example of interdisciplinary concepts to show students how the future of learning will be interdependent. GIS can be used it virtually every classroom. Students will be exposed to various subject areas including: criminal law, police science, and computer technology. The project will also use a number of popular teaching strategies including:

Figure 3: HOTAAR Matrix **Figure 4: Depth of Knowledge Quad**



Teaching Implementation / Lesson Plan



Teaching Implementation/Lesson Plan

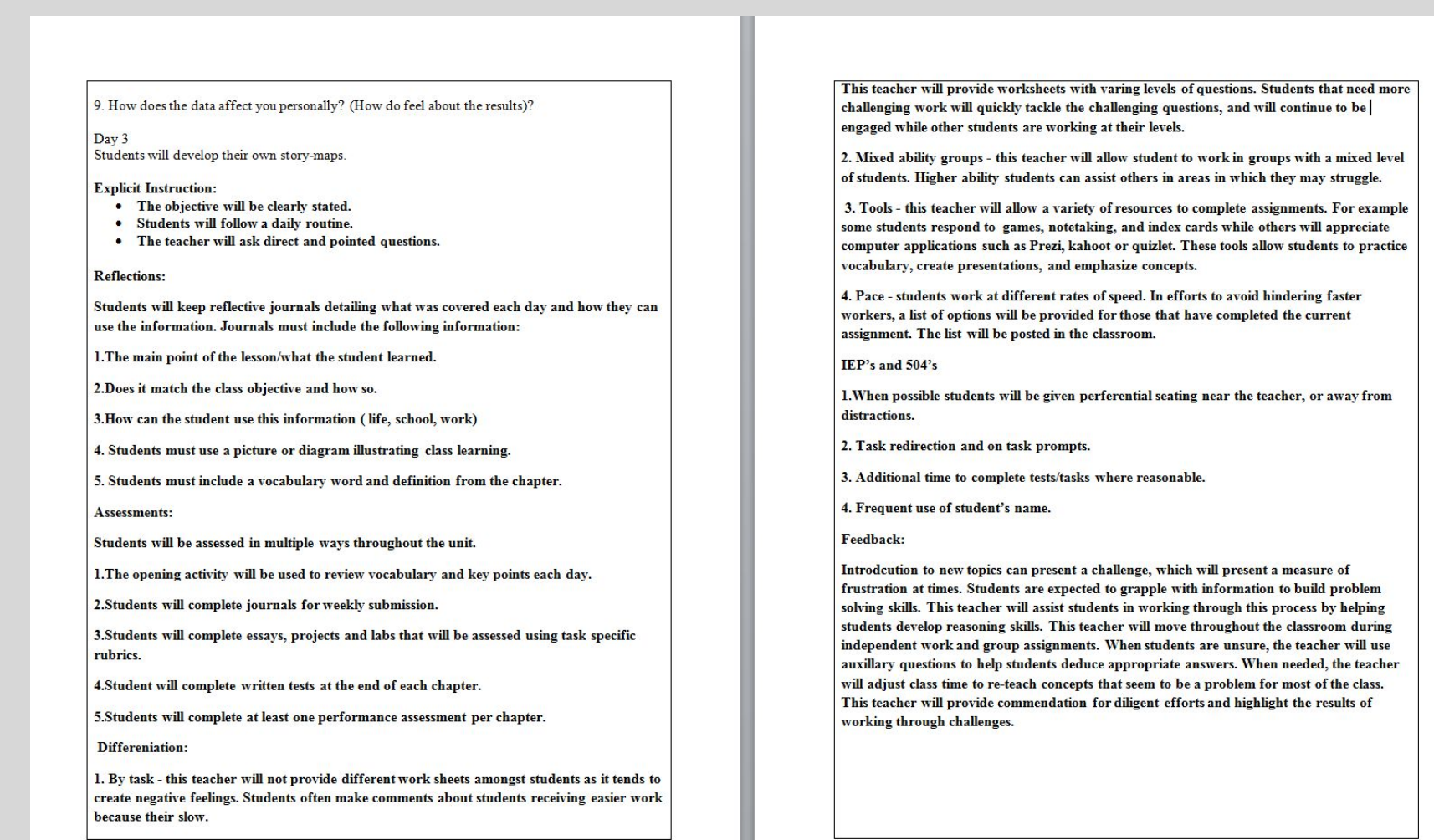
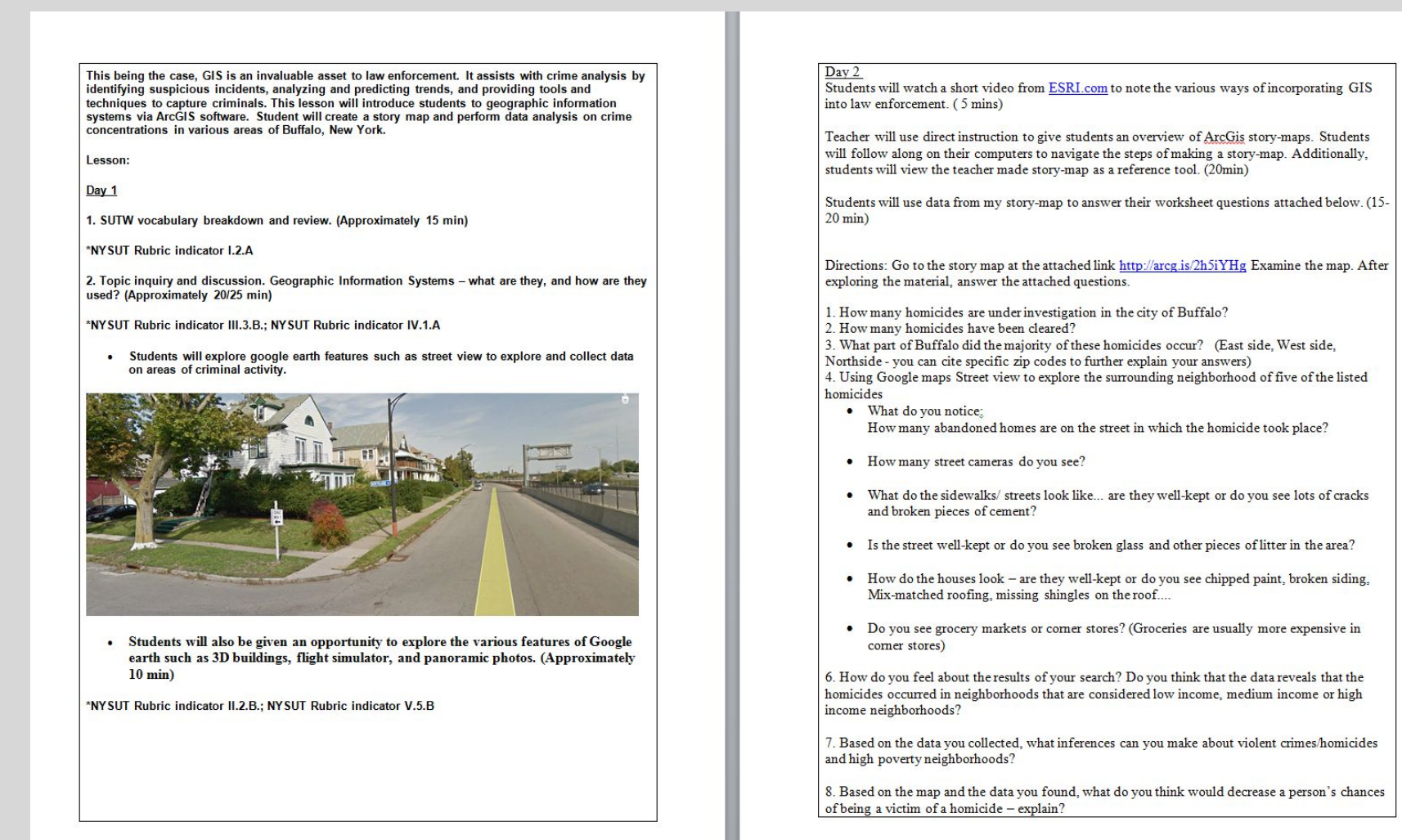


Figure 5: Image of lesson plan for unit instruction.

Teaching Implementation/Field Trip



Figure 6:
Visit to Erie
County
Crime
Analysis
Lab –
74 Franklin
St, Buffalo,
New York.

Per Commissioner O'Donnell, The Erie County Crime Analysis Center will provide an up-to-date snapshot, as well as a panoramic view, of crime throughout Erie County on a daily basis.”[6]

Results and Discussion

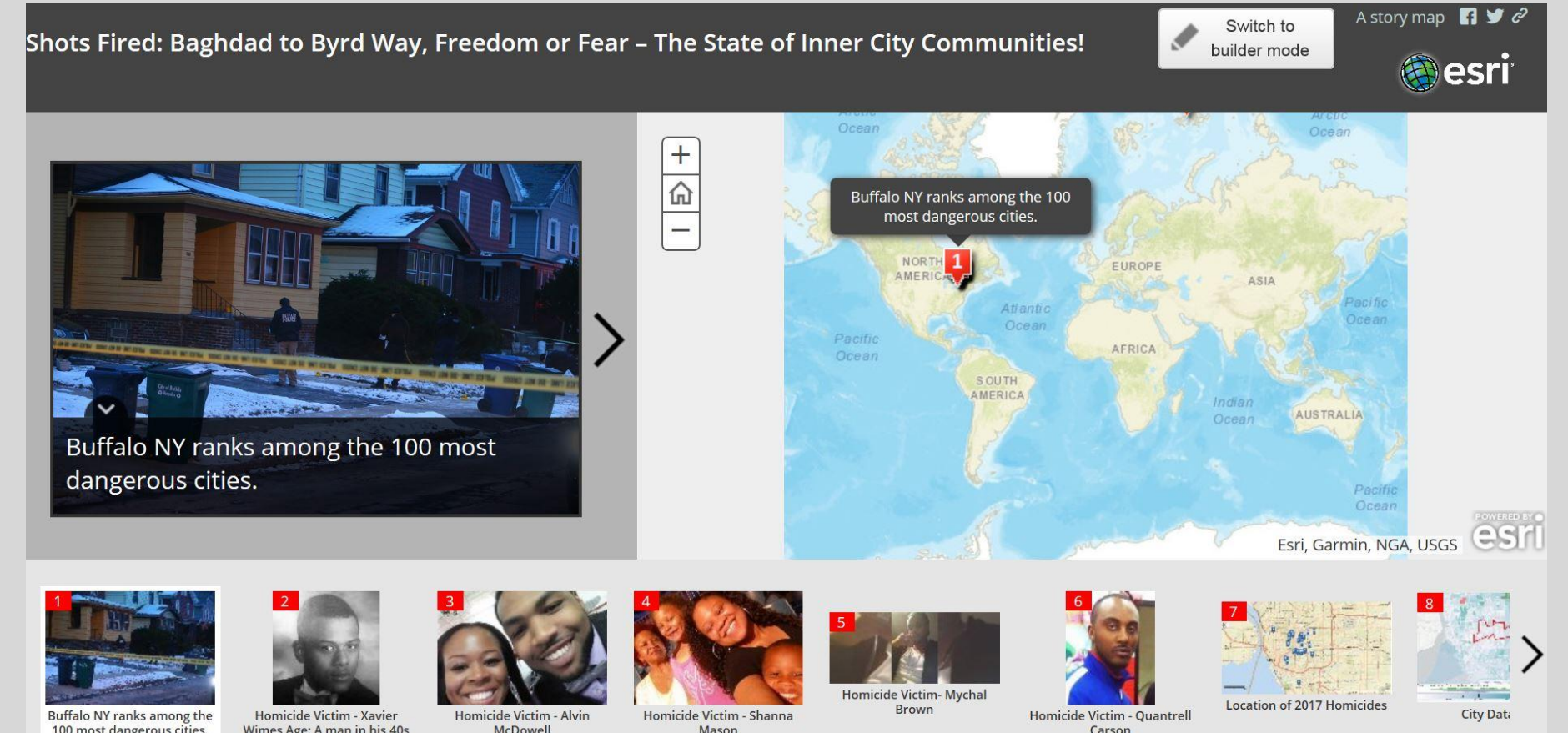


Figure 7: Image of story map.

- Review of five homicides and their locations as listed by the Buffalo Police Department. Students will analyze the remaining 12 homicides in their projects.

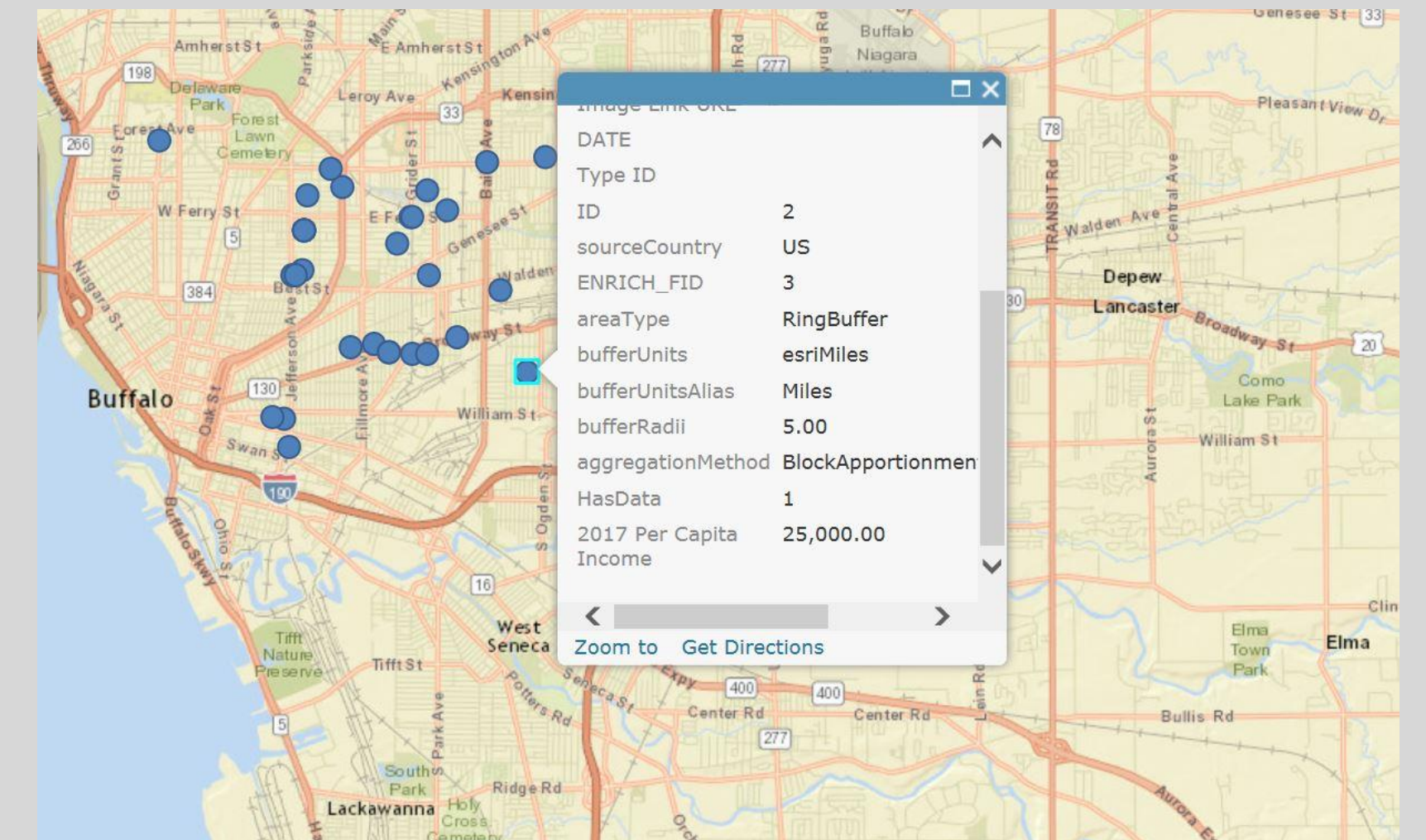


Figure 8: Map analysis of Buffalo NY homicides and per capita income.

- Most of the 2017 homicides took place in 4/5 of Buffalo's 44 zip codes.
- Household incomes for all homicide victims were below \$25,000.

Conclusions

- GIS is a flexible computerized tool that exemplifies the concept of interdisciplinary studies.
- GIS allows the presentation of information in multiple areas of study to analyze how data is similar or different, analyze how and why individuals behave in certain ways, and even predict future patterns of activity.

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