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Endangered Species and Data Integration

Students have heard that we are living in the 6th age of extinction. They hear that the number of endangered species are rising consistently. They hear that this is a problem that needs to be addressed. But they don't know how to do anything about it. When asked what species are endangered they have uniformly answered, over the past five years in my class, that the polar bear is an endangered species. (1)

This idea was made popular by Vice President Al Gore in his 2006 documentary, "An Inconvenient Truth". The funny thing is that it is not true so far as we can tell. Since we began counting the number of Polar Bears they are currently at the highest population ever. (2)

Part of the problem is that we are getting our data interpreted through other people. These other groups may or may not have some kind of agenda. Even if we do not ascribe manipulative reasons for the discrepancies it is important that students become familiar with how to find the best available data and how to express it as best as they know how.

Towards that end I want students to look at geographic data about endangered and extinct species. I would like students to be able to find where those species originally existed, how those populations currently exist in comparison and whether there are any patterns that they can determine when they look at where endangered species are most likely to be found.

The goal would be to have students acquire data listing endangered plants and animals in the United States using data from the Fish and Wildlife Service (3). The data can be viewed as a statistical table which students could impose onto a map of the United States. This would allow students to see whether there are any patterns. Perhaps there is a relationship between human development and endangered species? Perhaps regions where migration patterns have been affected are more vulnerable? Maybe water ways are strongly correlated with vulnerability.

By beginning to see the relationship with geography and vulnerability students can propose other correlations that they might want to explore in a group setting. They could propose options for different layers of map data to examine and then present their findings to the class. This would be a good way for us to integrate data and for them to extend that data integration in ways that they connect with.

An assignment I would like to see students do would be to take the data of endangered species and place it in context on a map. The students would answer questions that helped them articulate certain patterns that might exist. Students would find, for example, that species on islands are more vulnerable to extinction that species that exist on larger land masses.

Once the students have created a visual representation of the data and answered questions to help them articulate the patterns they notice they would be able to write up their findings as a story map (4). A story map is an interactive narrative that would accompany the map they create. The students could present this information to the class. The investigation could be further extended by having students go in depth by exploring different aspects that influence endangerment or extinction. Some students might be interested in looking at a particular location and learning more in depth about the challenges there.

Maybe a student from the Caribbean might want to explore challenges in their region. Perhaps a student with a particular affinity for amphibians might want to explore why amphibious creatures are more vulnerable to changes in the environment when compared to other creatures. The possibilities for expanding this and allowing each group to develop their own expertise that they can share with the group is exciting. The opportunity to analyze data, create a visual representation of it to find patterns, and share those discoveries visually and through storytelling is an exciting opportunity for students.

1. https://www.nationalgeographic.com/science/article/polar-bears-starve-melting-sea-ice-global-warming-study-beaufort-sea-environment
2. https://www.canadiangeographic.ca/article/truth-about-polar-bears
3. https://www.fws.gov/endangered/
4. https://www.esri.com/en-us/arcgis/products/arcgis-storymaps/overview