

Trash Troop: tackling trash together!

Google Earth Rivers

Most Polluted Rivers Activity

Goal

Familiarize students with Google Earth (GE) and its basic tools, including opening .kmz files, pinning locations on the globe, and measuring distances.

Introduction

This Google Earth activity is instrumental in familiarizing students with the basic tools GE has to offer in order to be able to complete the NOAA Marine Debris Program's Urban Trash protocols and fill out the accompanying data sheet.

Next Generation Science Standards

Practices

- Developing and using models
- Constructing explanations

Core Ideas

- ESS2.C The role of water in Earth's surface processes
- ESS3.C Human impacts on Earth systems

Crosscutting Concepts

- Systems and system models


Supplies

- Desktop Google Earth
- Garbage Patch .kmz file
- NASA video of buoy movement
- National Geographic Graphic and legend

Instructions

1. Open Desktop Google Earth.
2. Load .kmz file showing garbage patches around the world graphed by using buoy data collected by NOAA.
3. Unclick all of the layers and then click them one at a time to add them incrementally and be able to visualize the movement of the buoys.
4. Identify the 9 top polluting rivers based on National Geographic's image showing the most polluted rivers in the world.
5. Find the mouth of the rivers on GE and pin them under a folder marked for most polluted rivers.
6. Load the different layers one at a time, focusing on the movement of the buoys closest to the mouths of the rivers



7. Based on the movement of the buoys as the layers are added, make a hypothesis as to which of the several garbage patches around the world each of the rivers feeds.
8. Check this hypothesis with the NASA video showing the movement of the deployed buoys around the world.
9. Measure the distance traveled by the trash from the mouth of the river to the center of the garbage patch by using the measuring tool ().
10. Figure out which distance is the greatest to see just how far trash travels all around the globe.

Discussion

- From which river mouth does trash travel the greatest distance?
- How user friendly is Google Earth?
- Did you have any difficulties with any part of the activity?

References

Garbage Patch Visualization Experiment

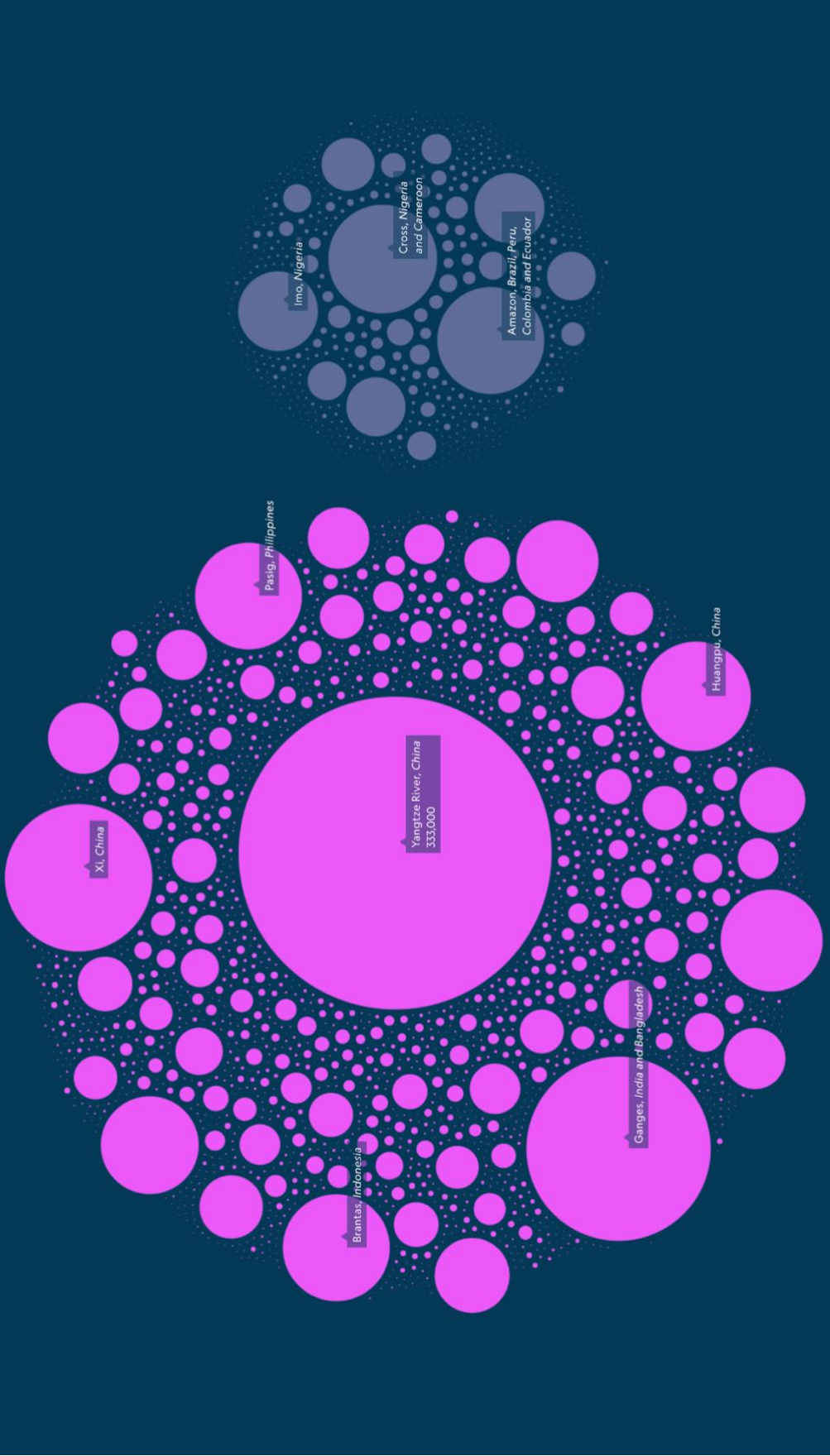
<https://svs.gsfc.nasa.gov/4174>

What Happens to the Plastic We Throw Out?

<https://www.nationalgeographic.com/magazine/2018/06/the-journey-of-plastic-around-the-globe/#close>

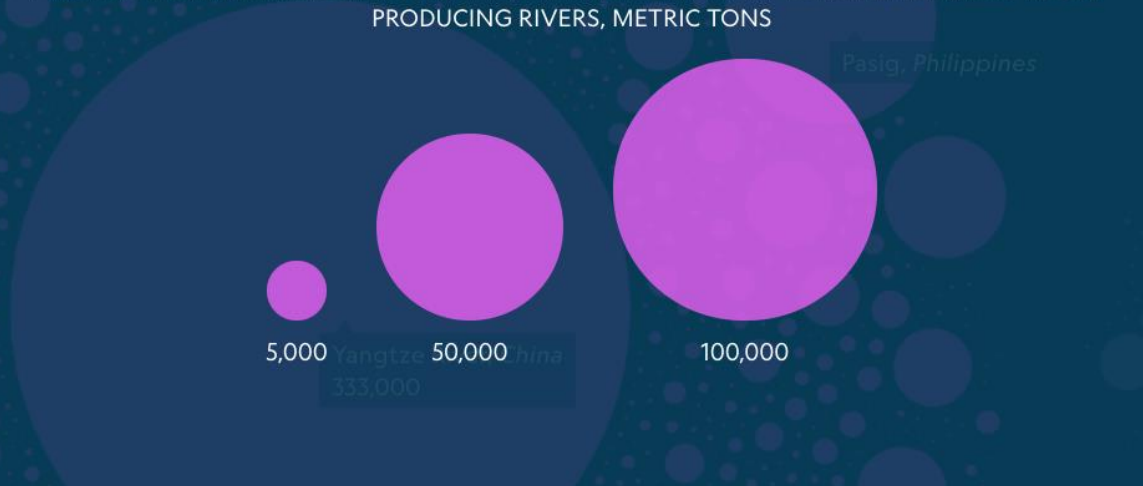
Marine Pollution

<https://admin.nationalgeographic.org/idea/exploring-oceans/>



● Asia ● Everywhere else

PLASTIC WASTE ENTERING THE OCEAN FROM RIVERS PER YEAR FROM THE TOP 3,000 WASTE-PRODUCING RIVERS, METRIC TONS



The 20 most polluted rivers account for two-thirds of the total amount of plastic entering the ocean from rivers. Fifteen are in Asia, in areas with frequent heavy rainfall and dense coastal populations. Rivers in Asia are responsible for 86 percent of input from rivers.

The top 122 rivers account for more than 90 percent of plastic input from rivers into the ocean and are fed by land that houses 36 percent of the global population. Relatively little plastic waste enters the ocean from North America and Europe because of their more robust waste-management systems.

Huangpu, China