

Satellite Image Watershed Exploration

33 Google map sheets
1 paper map assembly template
Set of 16 animal cards with 16 labels
Key to animal cards

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Guiding Questions

Have you ever followed or traced your local river on a map from its source to the ocean? Where does it start? Where does it end? How might the surrounding landscape influence the river's flow along its course? Ask students what a watershed is and what can be found in a watershed.

Content

A watershed is an area of land that drains water to a common point, be it a river, the bay, or the ocean. Santa Clara County is mainly in the Guadalupe River Watershed in which rain falls on the hills surrounding the southern end of San Jose, creeks form on those hills and combine into the Guadalupe River. The Guadalupe River runs north through the middle of San Jose into the San Francisco Bay which then drains into the ocean. All living things are a part of a watershed. A healthy watershed is necessary for the plants and animals living there.

In cities, the water which flows into storm drains when it rains flows directly into creeks and out to the San Francisco Bay. This means that any trash, motor oil, fertilizer, or other waste also may be washed down the storm drains. On the contrary, water which goes down the drains in our kitchens and bathrooms goes through pipes to waste water treatment facilities. Here, the water is strained of solid particles and bacteria are added to water which eat floating particles. This removes 90% of particles. Then, this bacterial sludge is removed, chlorine is added to kill harmful bacteria and viruses, chlorine is removed through evaporation, and the water is pumped out into San Francisco Bay.

This waste water treatment doesn't make the water completely safe though. Drugs like aspirin and heavy metals like lead and mercury are not removed from the water during the cleaning and end up in the environment.

Activity

Give each student one Google maps sheet. Explain that these are images of parts of our watershed taken with satellites from above the Earth and point out some of the obvious features:

- Blue lines = rivers and creeks
- Yellow lines = roads
- Green patches = vegetation
- Light geometric shapes = buildings.

Have students individually write down observations about their section of map listing as many different things as they can find. Then, as a class, share what was found and differentiate between man-made and natural features. If possible, use a document camera to show certain sections to the whole class.

Lay the paper template on the floor and gather the class around it. Have students lay each section of the map down matching the number on the back of the piece with the numbers on the template. There will be overlapping. Point out interesting features as you go:

- Top of the Guadalupe River Watershed at Mt. Umunhum.
(not on map, but located about 2 inches south of section 29)
- Bottom of the Guadalupe River Watershed at the San Francisco Bay.
- Creek locations near your school.
- Cities and streets.

In what direction does the water flow? What might be in the water after it flows through the city? Where is the water cleanest? Discuss the difference between water in the sanitary sewer system that goes to a water treatment plant versus that in the storm drain which flows straight to the creeks and the bay.

Who else uses the water?

Take out the animal photo cards and their matching names. Hand out one card to each student and instruct them to find their partner who has the matching card. Then have each pair of students discuss where on the map they think their animal is likely to be found. Prompt their discussion with suggestions such as: Have you seen this animal before? Where was it? Are you more likely to see it in an urban or natural area? Then have each pair share their answer and place their animal on the map.

Is there a pattern to where these animals are located? Challenge students to look for critters next time they cross a creek or are in a park. Ask the students what actions we can take to keep the water clean for everyone.

Extension Activity

Download "Watching Our Watersheds interactive map layers" from the Santa Clara Valley Water District website. Use these maps in Google Earth to see past and present landscapes of the Santa Clara Valley. Find it at <http://www.valleywater.org/WOW.aspx>