Celebrate Geologic Map Day!

Friday, October 16, 2020

Welcome to Geologic Map Day, a special event designed to promote awareness of geologic mapping and its vital importance to society. Geologic Map Day focuses the attention of students, teachers, and the general public on the creation, study, uses, and significance of geologic maps for education, science, business, and a variety of public policy concerns.

Organizing partners of Geologic Map Day are the U.S. Geological Survey, the Association of American State Geologists, the National Park Service, the Geological Society of America, NASA, and the American Geosciences Institute. The event is celebrated on the Friday of Earth Science Week (**www.earthsciweek.org**), a public awareness campaign that reaches over 50 million people each year with educational resources, information, and activities promoting awareness of Earth science. Please join us!

GEOLOGIC MAP RESOURCES ONLINE

Geologic Map Day
www.earthsciweek.org/geologicmap/

Look for Geologic Map Day on Facebook and Twitter!

FREQUENTLY ASKED QUESTIONS

What is a geologic map?
Like all maps, a geologic map shows where things are in relation to each other. But while other maps highlight where you can find things like streets and streams, a geologic map traditionally shows the distribution, nature, and age relationships of rocks, faults, and strata.

A geologic map is often superimposed over a regular map, or base map, to help you find familiar locations on the map. The base map usually is printed in light colors, while geologic features are represented using bolder, more readily visible colors, lines, shapes, and symbols. Each color on a traditional geologic map stands for a different geologic unit, that is, a volume of rock of a particular type and age.

How do you read a geologic map?
A geologic map typically has a map key, which is a table explaining the meanings of all colors, line types, and symbols used to represent geologic features in the map. For example, geologic units usually are listed in order, top to bottom, from the youngest (most recently formed) to the oldest (formed earliest in time). The key often gives the name of each unit, as well as the age and a brief description of that unit's rocks.

In addition to units, the key usually explains the map's use of lines and symbols. Lines might show where two units meet and perhaps bend, fold, and warp up against one another. Symbols might indicate where you can find things like fossils, precious metals, or active faults.

How do you use a geologic map?
Like people all over the world, your life is shaped by the geology of your area. Is the ground good for building or farming? Are you likely to find available groundwater? What natural resources are there underground? What is the likelihood of a natural disaster such as an active volcano or earthquake?

As we can see in the maps on this poster, geologic maps can be used to identify and locate a variety of natural features and phenomena. Geologic maps are necessary to help us navigate among the many challenges and opportunities offered by the Earth systems that surround us, no matter who or where we are.

LEARNING ACTIVITY:

WHAT'S IN A NAME?

Grade Level: 6-10
Source: American Geosciences Institute.

How did the place where you live get its name? Was it named after an explorer, the town founder, or some other prominent community member? A perhaps surprising number of cities across the country are named for Earth materials found there.

You can find examples from coast to coast. Ironville, New York. Shale City, Illinois. Granite Quarry, North Carolina. Coalville, Utah. Oil City, Pennsylvania. Silverton, Oregon. Mineral, Virginia. And there are many more.

Surprising? Hardly. The availability of raw materials such as rocks, minerals, metals, aggregates, and fossil fuels shapes and is shaped by community activities such as mining, manufacturing, construction, transportation, food production, energy generation, and product recycling.

On the front of this poster, we discussed copper. Towns called Copperville can be found in Alaska, Arkansas, Idaho, Maryland, and New Hampshire. There is a Coppervale, California. You can even visit the Coppertown Mining Museum in Michigan.

In this activity, you will look closely at a geographic map of Arizona, research places across the country where raw materials have been instrumental in communities, and discuss how communities develop practices and policies that reflect their values in relation to Earth materials.

Materials
- Geologic Map of Arizona (shown here)
- Computer with internet access

Procedure
1. Look at the geologic map of Arizona shown here. What does the map show you? Where in Arizona can copper be found? Where is copper mined? What does the map tell you about the areas where copper is most commonly mined?

2. Now go online and do some research about the town of Copper Creek, Arizona. Though it is now a ghost town, it was not always so. View a map of Arizona that shows where Copper Creek is located, then find the spot on this geologic map of Arizona. How did the town get its name?

3. Research and discuss: In places such as Copper Creek, how are raw materials like copper extracted from the Earth? How are they processed, distributed, used, and finally disposed of or recycled? How do other raw materials factor into these processes, such as those used in roads, fuels, and packaging?

4. Next, visit the website of your state geological survey or state geologist (**https://www.stategeologists.org/**) and the National Geologic Map Database (**https://ngmdb.usgs.gov/**). Find geological maps for the area where you live. See which Earth materials can be found there.

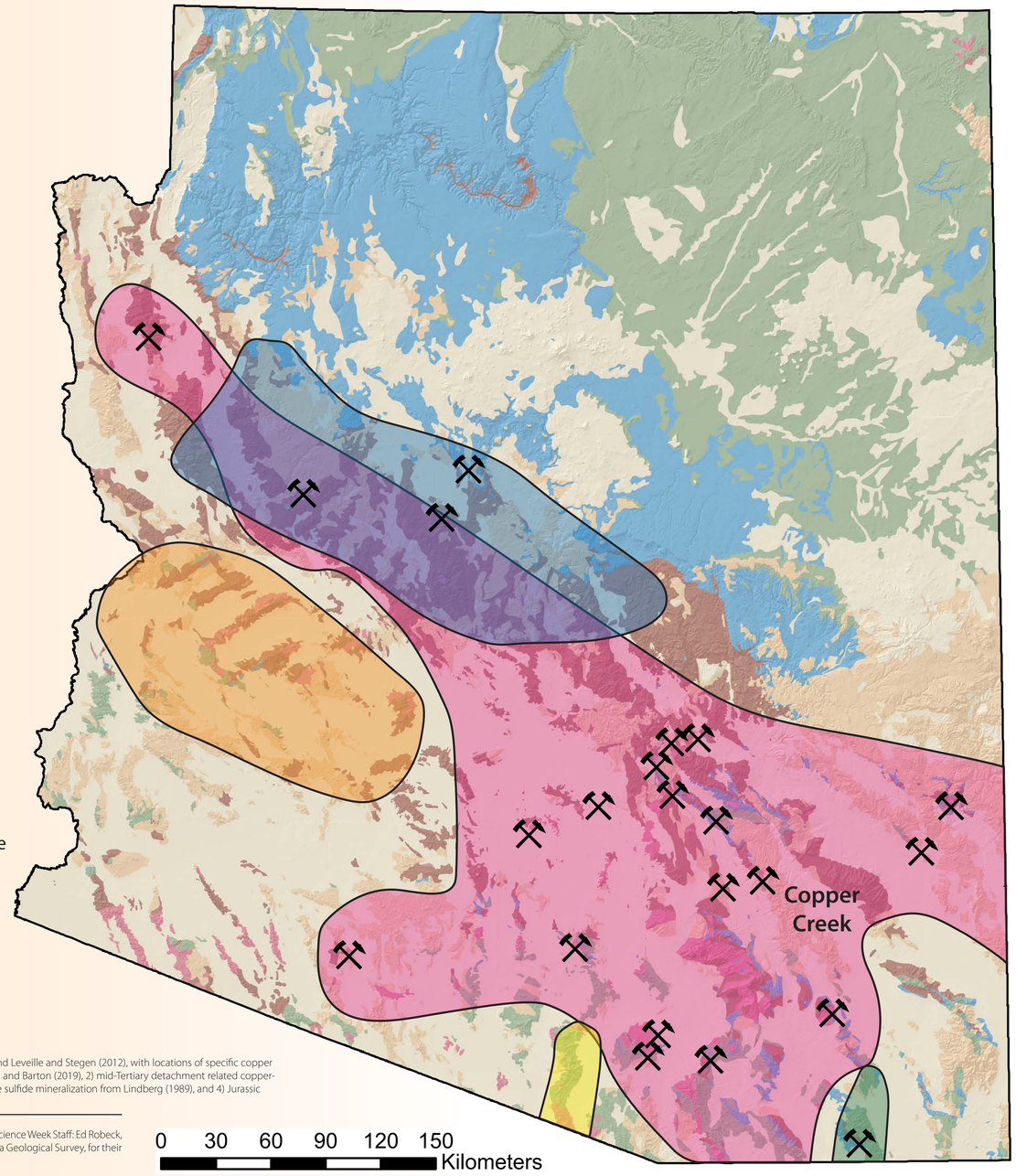
5. Finally, search online for a map of your state or region, and read the names of various cities, counties, valleys, hills, and other places. Find another place near you, like Copper Creek, that takes its name from an Earth material that has played a vital role in the community. Research the history of that place and how it got its name.

6. Research and discuss: How do people develop processes that enable them to turn Earth materials to things that have practical value? How do people develop policies that guide the way Earth materials are extracted, processed, distributed, used, and disposed of or recycled?

NGSS Connections
- Science and Engineering Practices — Natural Resources
- Disciplinary Core Ideas — Obtaining, evaluating, and communicating information
- Crosscutting Concepts — Systems and system models

Geologic maps depict the distribution, nature, and age relationships of rocks, faults, and strata in locations throughout the world. In doing so, such maps enable us to locate Earth materials including rock, fluid, gas, metal, soil, and mineral materials. Grand Canyon National Park (shown here) celebrated its 100th anniversary last year in northwestern Arizona, where copper deposits can be found.
Photo by Christopher Keane.

GEOLOGIC MAP OF ARIZONA, HIGHLIGHTING AREAS WITH COPPER DEPOSITS



Map by Carson A. Richardson, Ph.D., Arizona Geological Survey. Base geology from Richard et al. (2001) and Leveille and Stegen (2012), with locations of specific copper mines from Leveille and Stegen (2012). Extent of: 1) Laramide porphyry copper mineralization from Greig and Barton (2019), 2) mid-Tertiary detachment related copper-gold mineralization from Spencer and Welty (1989) and Long (1992), 3) Proterozoic volcanogenic massive sulfide mineralization from Lindberg (1989), and 4) Jurassic mineralization from Keith et al. (1983) and Barton et al. (2014).

Poster Editorial and Design: AGI/Geoff Camphire and Brenna Tobler; Student Activity: Geoff Camphire; Earth Science Week Staff: Ed Robeck, Geoff Camphire, Sequoyah McGee. Many thanks to Michael Marketti, USGS, and Carson Richardson, Arizona Geological Survey, for their assistance in obtaining maps. Printing: Stephenson Printing Inc. Printed in the USA on recycled paper.

american geosciences institute
connecting earth, science, and people

AASG Association of American State Geologists

USGS science for a changing world

THE GEOLOGICAL SOCIETY OF AMERICA®

NASA

NATIONAL PARK SERVICE