

Citizen Science • Reflection Section Answer Guide

All Over the Map

Introduction

In your own words and in the form of a question, explain what the scientists were interested in studying. *How did the DYFI system change from 1999 to 2013? What are the advantages and disadvantages of gathering earthquake data from a citizen-based science network? How accurate and timely is the DYFI data?*

Based on what you have read so far, provide one example of how the DYFI system allows citizens to participate in science research. *The DYFI system allows people to report an earthquake right after they feel the earthquake. The citizens' reports help generate intensity maps for the earthquake.*

Methods

Name one reason you think the scientists were interested in learning about the timeliness and accuracy of the data from the DYFI system. Why do you think this reason is important? *Students will have individual answers to this question. They should, however, be able to give a reasonable and justified explanation for why they think scientists would want to know if the data are timely and accurate.*

What do you think are one or two advantages of comparing different maps for earthquake data? *Students will have individual answers to this question. They should, however, be able to give one or two reasonable advantages such as comparing maps may be advantageous because the comparison provides a more holistic view of an earthquake. Another advantage may be that comparing maps would show areas of missing data. Knowing where missing data occurred could be used to help improve the mapping system. Comparing maps may also help scientists determine how reliable and accurate the data are.*

Findings

The scientists found that the data were of better quality in areas with large populations and easy access to the Internet. Why do you think an area with a large population may have a better quality of data? *Students will have individual answers to this question. They should, however, realize that areas with larger populations may have more people reporting in to the DYFI system. The larger number of responses would likely result in better quality data.*

Now that you have read about what the scientists found in their study of the DYFI system, name one advantage of citizen-based science. *Students will have individual answers to this question. Some examples of answers may be that: (1) citizen-based science allows citizens who are not trained in gathering data to contribute to science research; (2) citizen-based science can provide a lot of high quality and timely data; and (3) citizen-based science can provide citizens a way of communicating and sharing experiences with each other.*

Discussion

U.S. Geological Survey scientists reported that they can now monitor and collect data on all felt and reported earthquakes. Why do you think this may be useful to scientists and the public? *Students will have individual answers to this question. However, students should realize that knowing where earthquakes are occurring (even ones with small magnitudes) helps scientists understand and respond to earthquakes better.*

All Over the Map (continued)

Scientific research often exposes advantages and disadvantages of programs or topics being studied. One of the main disadvantages of the DYFI system is that the system is not able to get a lot of entries from areas harder hit by earthquakes. The scientists in the research paper discuss both the advantages and disadvantages of the DYFI system. Why do you think it is important to examine a system's advantages and disadvantages?

Students will have individual answers to this question. They should, however, be able to give a reasonable and justified explanation for why it is important to examine the advantages and disadvantages of a system. For example, students may realize that knowing the disadvantages can help improve the system in the future.