



## Rocky Mountain Mapping Center

### Land Use and Water Quality Lesson from USGS Rocky Mountain Mapping Center

#### Land Use and Human Impacts

Examine the USGS Map "Land Subsidence and Earth Fissures in Alluvial Deposits in the Phoenix Area, Arizona." This map shows how the land has been sinking, or decreasing in elevation, in the region.

1) Why is the land sinking in this part of Arizona? (7 points)

2) Is this land subsidence caused by humans or a natural occurrence? (circle your answer) (4 points).

human-caused      natural occurrence

3) What is the maximum amount of land subsidence in this area? (3 points)

4) What is the average amount of subsidence over this entire area? (3 points)

5) Do fissures, or crevasses, appear near land that is sinking or land that is not sinking? Circle your answer. (3 points)

sinking land      non-sinking land

6) Why have these fissures appeared? (5 points)

7) Name two reasons why land subsidence is a problem (8 points):

8) Is land subsidence more of a problem in urban areas or rural areas? (3 points) Circle your answer.

urban

rural

Beginning in the 1940s, the federal government subsidized development of cotton and other crops in the Arizona desert, using groundwater and water from the Colorado River. The heaviest concentration of cash crops for agriculture are in the Maricopa and Ak-Chin Indian reservations, and in the Santa Cruz Flats.

9) Circle the answer that best describes the climate in this region of the USA. (2 points)

Dry-hot summer with  
& dry-mild winter

Wet-hot summer  
& cool-wet winter

10) Based on your previous answer, would the cash crops in this region need to be irrigated or not? (2 points)

Yes, irrigation necessary  
necessary

No irrigation

11) Are the areas covered by cash crops prone to sinking or not? Circle your answer. (3 points).

Sinking

Non-sinking

12) Explain your answer to the previous question. (6 points)

## Water Quality and Human Impacts

Examine USGS Map I-857-E, "Lakes in the Colorado Springs-Castle Rock Area, Front Range Urban Corridor, Colorado."

13) Which lake contains water with the highest pH value? (3 points)

14) Is this value at the surface basic or acidic? Circle your answer. (3 points)

basic

acidic

15) In this lake, does the water become more basic or more acidic as one goes deeper into the lake? (3 points)

16) What are the two most significant factors that affect life in the water of these lakes? (8 points)

17) Are most of the large lakes (with graphs on the west side of the map) natural or human-built? (4 points)

18) How do you know? (6 points)

19) Look at the drainage patterns on the map. Why is the quality of water in Rampart Reservoir important to the community of Colorado Springs? (4 points)

20) Name three reasons why the growth of algae is a problem in these lakes. (9 points)

21) Which lake contains the most algae, and what is its concentration? (4 points)

22) Why is the chemical and biological quality of water in these lakes deteriorating? (7 points)

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Maintainer: [webmaster@rockyweb.cr.usgs.gov](mailto:webmaster@rockyweb.cr.usgs.gov)

URL: <http://rockyweb.cr.usgs.gov/public/outreach/landwat.html>

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