

Expected Notecard Answers for Geospatial Activity

On a notecard:

1. Identify units of erosion measurement in Figure A. Convert the average erosion rate into mm/year.

$$21 \text{ m/my} \times 1000 \text{ mm/m} = 2100 \text{ mm/my} = 2100/1,000,000 \text{ y} = 0.021$$

2. Figure A: Determine which regions in the United States have the highest natural erosion rates and predict why these locations have the highest rates.

The highest natural erosion rates are in areas of high elevation, like the Rocky Mountains.

3. Figure B: Determine which regions in the United States have the greatest erosion from human activity.

The greatest erosion from human activity is in the central Plains and near the central East Coast (the piedmont).

4. Describe how that rate compares to the natural rate of erosion.

The average erosion from human activity ($600 \text{ m/my} = 0.6 \text{ mm/y}$) is more than an order of magnitude higher than the average natural erosion rate (0.021 mm/y)

5. Predict the potential source of human erosion in Figure B.

The source of human erosion is agricultural activity.

Exit Questions:

1) Based on your work today, how does agriculture threaten the sustainability of soil? (2 pts)

A correct answer will consider how the rate of agricultural soil erosion relates to soil production. (1 pt) It should also consider the spatial coverage of eroding landscapes. (1 pt)

Agriculture threatens the sustainability of soil because it increases the rate of erosion with respect to nature. Agricultural erosion rates are an order of magnitude higher than natural erosion rates. Students might recall specific numbers from the figures that they looked at (e.g. average agricultural erosion rates 600 m/my, vs. nature 21 m/my).

2) Does what you learned today through exploring the figures of natural and cropland erosion support or conflict with your initial perceptions of erosion? (1 pt)

Your answer should refer to your initial impressions of erosion as we looked at the pictures of agricultural and mountain erosion. Did you think mountains or croplands were more erosive? Is this consistent with what you learned by looking at the figures?

Student responses will vary but should describe initial perceptions vs. data examined.

3) Reflecting on your comparison between the two erosion figures, what question(s) do you still have?

1 question required, more allowed (1 pt).

Student responses will vary.