Mapping the Flood

Compare map sources to explain where flooding affects people.

USG.P.2.3.B "Compare and analyze complex maps and mapping technologies to analyze spatial patterns of human and physical environments, explaining relationships between the environment and events, past and present."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline at least three map sources, circle one physical pattern and one human pattern, and connect the circled patterns with a line to show a possible relationship.

Houston Through Different Maps

1 In August 2017, Hurricane Harvey stalled over southeast Texas, dropping extreme rain on Houston and nearby communities. To study why some blocks flooded, a geographer could begin with a topographic map, which shows land elevation and the paths of Buffalo Bayou and other waterways. Low ground near a bayou can collect runoff from higher streets. A second layer, a map of roads and buildings, shows which homes and travel routes lie in those low areas. Together, these maps connect a physical pattern, where water is likely to gather, with a human pattern, where people live and move.

2 Before Harvey, flood-risk maps showed areas likely to flood during storms of certain sizes. They were useful for planning, but they did not predict exactly which homes would flood in Harvey. As rain fell, weather radar mapped where heavy rain was falling, not where water had already reached the ground. After the storm, satellite radar images helped locate standing water, even where clouds blocked an ordinary camera. Comparing these sources revealed a mismatch: some flooded places lay outside previously mapped high-risk zones. Each technology answered a different question, so no single map told the full story.

3 An analyst might compare a 2017 satellite flood image with a current street map to ask which roads could be cut off by a similar event today. That comparison needs care: new construction, drainage work, and shifting land use can change the routes water takes. A flood image records one event, while a risk map estimates chances across many years. If a busy road crosses low ground where floodwater spread in 2017, planners could inspect that crossing before choosing evacuation routes. They should also check updated elevation and road data rather than treating the old flood image as a forecast.

2 ANSWER WITH EVIDENCE

Use the passage

1. What relationship could a topographic map and a map of roads and buildings reveal about flood risk to people?

2. How would weather radar and satellite radar images give different information about Harvey?

3. What did comparing flood-risk maps with images of Harvey's floodwater reveal, and why is that difference important?

4. Which map sources should planners compare before using a road near Harvey's floodwater as an evacuation route today? Explain why.

3 YOUR TURN

Your own words

Imagine planning for a heat wave in another city. In four sentences, name two different map layers you would compare, predict a spatial pattern they might reveal, explain how that pattern could affect people, and state one limit of your evidence.

ANSWER KEY

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HIGH SCHOOL · USG.P.2.3.B

PART 1 · READ AND MARK

Underline at least three map sources, circle one physical pattern and one human pattern, and connect the circled patterns with a line to show a possible relationship. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	What relationship could a topographic map and a map of roads and buildings reveal about flood risk to people?	**They could show where homes and travel routes lie on low ground near waterways, where runoff may collect.**
2	How would weather radar and satellite radar images give different information about Harvey?	**Weather radar showed where heavy rain was falling. Satellite radar images helped locate standing water after the storm.**
3	What did comparing flood-risk maps with images of Harvey's floodwater reveal, and why is that difference important?	**Some places flooded outside previously mapped high-risk zones. A risk map estimates the chance of flooding, but it does not predict every place that will flood in a particular storm.**
4	Which map sources should planners compare before using a road near Harvey's floodwater as an evacuation route today? Explain why.	**They should compare the 2017 flood image with current road and elevation data. Construction, drainage work, or land-use changes may have altered the road or how water moves.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

I would compare a satellite map of surface temperatures with a city map of tree cover. Blocks with little tree cover might show higher surface temperatures than shaded blocks. People waiting outdoors on those hotter blocks could face greater heat exposure. Satellite surface temperatures do not directly measure the air temperature people experience.

Accept other map comparisons when students accurately distinguish what each source shows and explain a plausible relationship between a physical pattern and people's activities or safety.