

CULMINATING TASK: Challenge 1

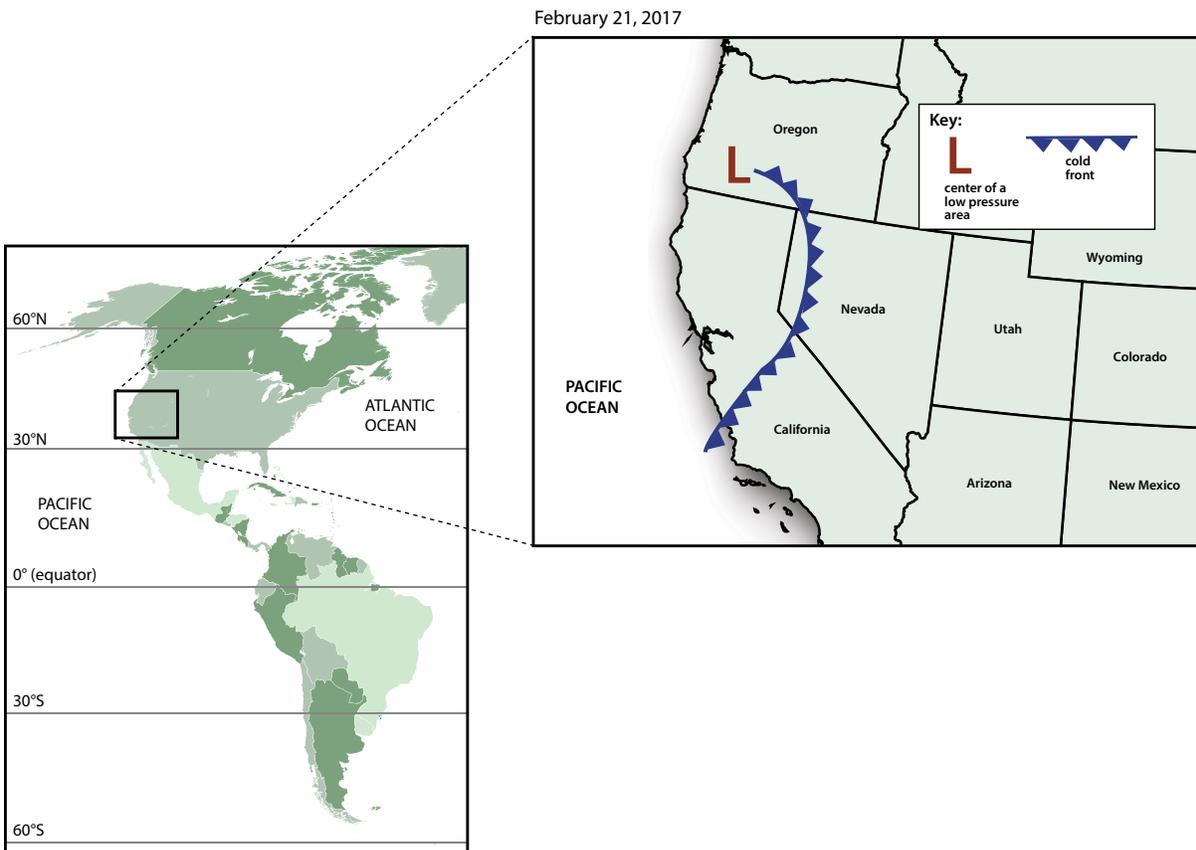
Why did the storm cause rain in some places and snow in other places in California?

On February 20, 2017, a storm passed through California on the West Coast of the United States. The storm brought extreme rainfall which caused flooding and mudslides in some places. The storm brought deep snow to mountainous areas of California.

USA TODAY:

Battered Northern California blasted by new storm

"The National Weather Service was calling for up to eight inches of rain over parts of the region Monday and Tuesday. Wind gusts in some areas could reach 65 mph. Flood warnings for a handful of rivers could last until week's end — this for a state that two months ago was mired in severe drought. Heavy snow was forecast to pound the Sierra Nevada Mountains, where totals will be measured in feet, not inches."



Why did the storm cause rain in some places and snow in other places in California?



STEP 1: Analyzing the California storm.

Use the maps on the previous page and what you have learned about storms to answer the questions below.

1. Based on what you learned about global winds, where do you think the cold front was located before it passed over California?
2. For a storm to cause rain and snow, there must be moisture in the air (humidity). Where do you think the moisture in this storm came from before it was in the atmosphere? Consider what you know about the water cycle as you answer.
3. Based on what you learned about cold fronts and the symbols on the weather map on the previous page, where do you think the storm will go next? How do you know?

Why did the storm cause rain in some places and snow in other places in California?



STEP 2: More details about the California storm: On February 21, 2017, the town of South Lake Tahoe, California, had 6.1 cm (2.4 inches) of rain. Meanwhile, the nearby summit of Heavenly Mountain had 61 cm (24 inches) of snow.

1. What information would you need to decide whether rain or snow will fall during a storm? Explain your answer.
2. Look below at the cross section showing the town of South Lake Tahoe and Heavenly Mountain. Use what you know about the atmosphere to explain why it snowed on Heavenly Mountain, but rained in the town of South Lake Tahoe.
3. Draw on the cross section below.
 - a. Indicate where the atmosphere is colder and where the atmosphere is warmer.
 - b. Indicate the location where it rained and the location where it snowed. Also indicate where along the ground you think a rain/snow mix may have fallen.
 - c. Indicate if there are places where you would like more information to know whether rain, snow, or a rain/snow mixture fell.

