

LESSON
11

What could cause a front to stall?

Even though Colorado is far from the ocean and other large bodies of water, there was an unusually high amount of moisture in the air above Colorado, and the storm didn't move for days, which led to the flooding event in September 2013. In this activity, you'll examine information about the storm. Your goal is to figure out what led to so much moisture in the atmosphere and to develop a model to show why this precipitation event lasted so long over Colorado.

STEP 1: Analyze data for the Colorado storm.

Using the table of daily rainfall totals collected during the storm at Centennial Middle School in Boulder, Colorado, choose which of the claims below you believe is true about the Colorado storm in September 2013.

DATE	RAINFALL* (mm)
9/10/2013	23.9
9/11/2013	35.1
9/12/2013	214.1
9/13/2013	84.1
9/14/2013	0.8
9/15/2013	4.8
9/16/2013	36.8

*Rainfall totals are for the same Colorado storm, which lasted for seven days.

- The Colorado Storm in September 2013 was an isolated storm.
- The Colorado Storm in September 2013 was a cold front.
- The Colorado Storm in September 2013 was unlike either an isolated storm or a cold front

1. Explain why the claim you chose is true. Use evidence to support your claim.

What could cause a front to stall?

STEP 2: Interpret the storm report.

Read the storm report below to collect information about how the air was moving, how moisture was moving, and where rain was falling during the storm.

STORM REPORT

➤ **High Pressure:** There was high pressure to the north, over Wyoming, which was pushing a cold air mass south and there was a high pressure area to the south, over Mexico, and high pressure to the east over Tennessee and the surrounding area. This caused the front to stall over Colorado.

Low Pressure and Moisture: Low pressure over Utah and Nevada pulled warm, humid air from the Gulf of Mexico and eastern Pacific into the storm.

The Effect of Mountains: As the air traveled up the eastern side of the Rocky Mountains, it formed clouds and then rain, and remained in place for days.

Create a model for the storm: Use the symbols from the key and the information in the storm report to develop a model. Indicate on the model the direction air is moving based on the highs and lows, and where the humid air that caused the storm is coming from.



KEY:



the center of an area of low pressure



the center of an area of high pressure



cold front



area of rain
(choose a color)

What could cause a front to stall?

STEP 3: Use your model to explain what happened in Colorado.

Use your model of the Colorado storm to answer the questions below.

1. Where did the moisture come from for the storm?
2. What kinds of air masses interacted in the storm? Which air mass had the moisture for the storm?
3. What caused the precipitation at the front?
4. Why did the front stall, causing days of drenching rain in parts of Colorado?