

# Can Geo in the Classroom - Understanding Atmospheric Rivers

## Inquiry Question

What are atmospheric rivers? How can they shape weather patterns and affect people and environments?

## Time

30-45 mins

## Grade Level

9-12

## Learning goals

Students will:

- Interpret information presented in an infographic.
- Understand how atmospheric rivers form and move through the environment.
- Explain how physical geography can influence precipitation patterns.
- Consider how extreme weather events can impact communities.

## Part A: At First Glance

Begin by displaying the infographic image. Before reading any text, ask students to examine the infographic to make predictions about what type of weather system is being shown and how it might affect different places.

Tell students that this infographic shows a weather system that carries large amounts of moisture through the atmosphere. Knowing this, ask students the following questions to get them thinking about the image:

- What do you notice first in the infographic?
- What roles do the ocean, air, and mountains play?
- What natural features or processes are being shown?
- Why might this type of weather system produce very different effects depending on where it makes landfall?
- How might the impacts of this event differ in a remote or rural area compared to a densely populated region (city)?

## Part B: Understanding the Process

Distribute a copy of the infographic and a student worksheet to each student. Explain that atmospheric rivers are complex weather systems, but the infographic breaks the process into key ideas. As students read, ask them to focus on identifying the most important information about atmospheric rivers and to think about how they would explain the concept in their own words.

Students should summarize the main ideas from the infographic rather than copying phrases directly when answering the questions on their student worksheet. Once students have finished reading, briefly review the key concepts as a class.

## Part C: Applying Geographic Thinking

After students have developed an understanding of how atmospheric rivers form and move, shift the focus to how these weather systems can affect people living in different geographic regions.

On the other side of the student worksheet is a four-section organizer, where each section represents a different type of region or community that may experience atmospheric river events. Explain that students should use what they learned from the infographic to think about how atmospheric rivers might affect daily life, safety, infrastructure, and natural resources in each location.

Students will focus on the following regions:

- Coastal communities
- Mountain communities
- Inland or valley communities
- Dense urban areas

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In each section, students are encouraged to describe:

- what kind of weather impacts might occur
- how people living there might be affected
- possible ways communities could prepare or respond

Encourage students to consider both positive impacts (such as water supply) and negative impacts (such as flooding or landslides). Students may complete the exercise individually, then share and compare ideas with a partner or small group. Once students are finished, discuss answers as a class.

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## Student Worksheet - Atmospheric Rivers

As you read the infographic about atmospheric rivers, answer the following questions to help your understanding.

1. According to the 2018 definition, what are atmospheric rivers?

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2. Where does the moisture in an atmospheric river usually come from?

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3. How does this moisture move through the atmosphere?

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4. What happens when an atmospheric river reaches mountains or higher land?

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5. Why are atmospheric rivers getting worse?

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6. Identify some pros and cons of atmospheric rivers.

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7. How can atmospheric rivers impact water supply in some regions?

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8. How is climate change affecting atmospheric rivers?

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## Atmospheric Rivers - Impacts on Communities

Use what you have learned about atmospheric rivers to think about how this weather system may affect people living in different regions.

In each section of the table, describe:

- the type of weather impacts that could occur
- how people, homes, transportation, or resources could be affected
- one way communities could prepare for or respond to these events

Coastal communities	Mountain communities
Inland or valley communities	Dense urban areas

Why can atmospheric rivers be important for water supply in some regions?

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