


# Short Performance Assessment: 5-ESS2-1

Grade Level: **Fifth Grade**

Adapted from [SNAP](#)<sup>1</sup>

Title	The Driest Place on Earth		
Designed by	Paul Andersen	Course(s)	Grade 5 NGSS
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Performance Expectation	<p><b>5-ESS2-1:</b> Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.</p> <p><b>Clarification Statement:</b> Examples could include the influence of the ocean on ecosystems, landform shape, and climate; the influence of the atmosphere on landforms and ecosystems through weather and climate; and the influence of mountain ranges on winds and clouds in the atmosphere. The geosphere, hydrosphere, atmosphere, and biosphere are each a system.</p> <p><b>Assessment Boundary:</b> Assessment is limited to the interactions of two systems at a time.</p>
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Science and Engineering Practice	<p><b>Developing and Using Models</b></p> <ul style="list-style-type: none"><li>• Develop a model using an example to describe a scientific principle.</li></ul>
Disciplinary Core Ideas	<p><b>ESS2.A: Earth Materials and Systems</b></p> <ul style="list-style-type: none"><li>• Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth's surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather.</li></ul>
Crosscutting Concept	<p><b>Systems and System Models</b></p> <ul style="list-style-type: none"><li>• A system can be described in terms of its components and their interactions.</li></ul>

Student Performance	<ol style="list-style-type: none"><li>1. Components of the model</li><li>2. Relationships</li><li>3. Connections</li></ol>
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<sup>1</sup> The Short Performance Assessment (SPA) and the Assessment Rubric adapted from the Stanford NGSS Assessment Project <http://snappgse.stanford.edu/>



Name\_\_\_\_\_

## The Driest Place on Earth:

Background:

The Atacama **desert** is the driest place on Earth. The average **rainfall** is .06 inches per year and some weather stations in the Atacama have never received rain. The Atacama is so dry that many **mountains** higher than 20,000 ft are completely free of **glaciers**.

The Atacama desert sits in the shadow of the Andes Mountains which block the rainfall from the east. To the west of the Atacama desert is the Pacific Ocean. Cold **ocean** water prevents the evaporation of water and the formation of **clouds**.



1. You will be developing an interacting system model to explain the dry weather of the Atacama. Write the names of the **highlighted** words in the text above in the correct spheres below.

Biosphere	Hydrosphere	Geosphere	Atmosphere

**Your Task:**

You will be creating an interacting systems model that will explain the dry weather of the Atacama Desert. Additional information will be provided on the following pages related to landforms, bodies of water, and weather data. Use this and the information in the background to create your model.

2. Your model must include interactions between the two spheres. Circle the two spheres above that contain the largest number of words?

Biosphere

Hydrosphere

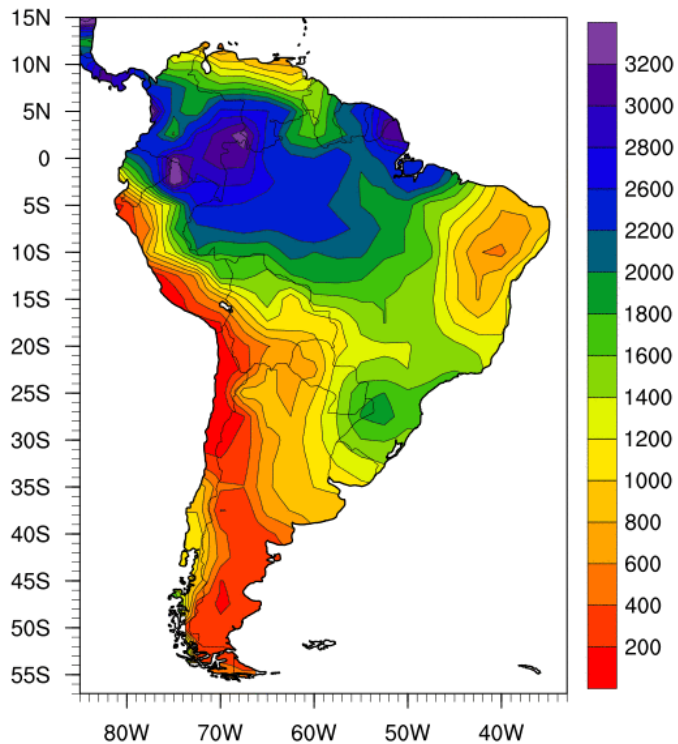
Geosphere

Atmosphere



## Observed Annual Total Precipitation

1976-2009, 2.5 degree grid

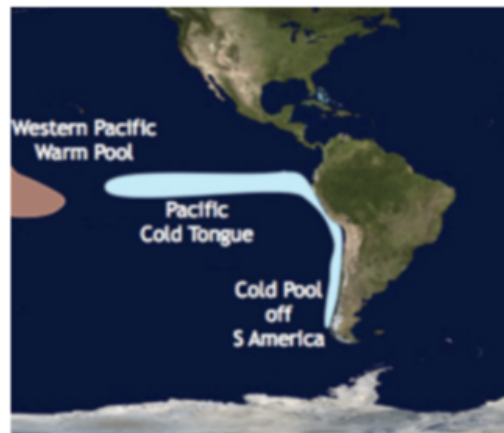


**Atacama  
Desert**

([Source](#) - Image 1) ([Source](#) - Image 2)



On the other side of the Pacific water is pushed away from the South American continent by wind. This allows deep water to come to the surface.



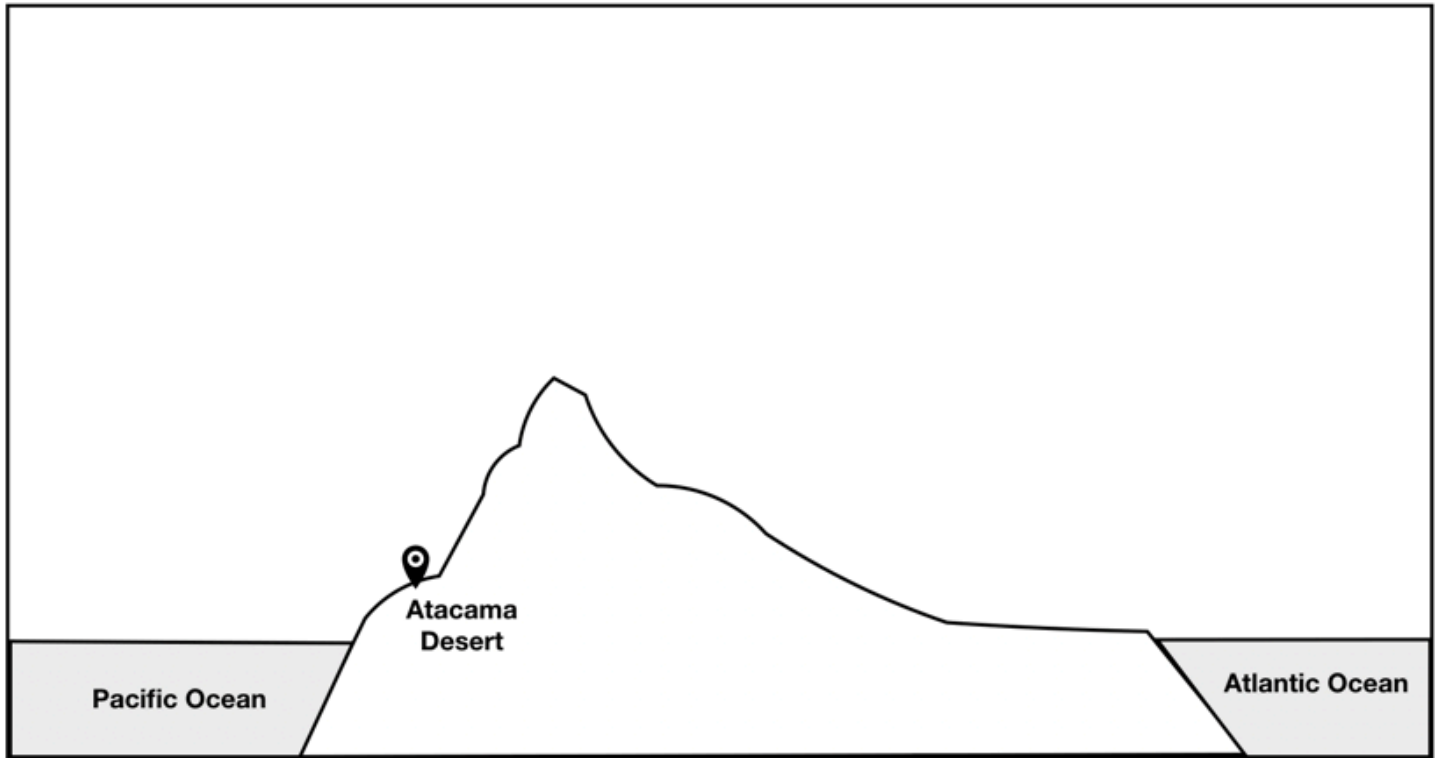
([Source](#) - Image 3) ([Source](#) - Image 4)



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3. Develop an interacting system model in the space below to explain why the Atacama Desert is the driest place on earth. Your model should include important **terms** of the two spheres circled in question 2. Make and label **a key** to identify the two spheres in your model.



4. Use your model to describe how the two spheres interact and work together to create the driest place on Earth.
5. How is an additional sphere impacted by the two you represented in your model? Explain your thinking.