

Investigating Monsoon and Rainfall in India

From ESRI India Geo-Inquiry Team

Target Audience: Class 9 Geography Students

Time required: 1 hour and 10 Minutes

Indicator: *Understand the monsoon and spatial pattern of rainfall related to areas, season and location.*

Learning Outcomes: Students will analyze monsoon season and rainfall in India using web-based mapping tools to:

1-Symbolize and classify a map of Rainfall and Monsoon in India.

2-Examine Rainfall pattern using the data of rainfall ranges all across the world.

3-Understand the relationship between rainfall and the geography of that location.

4-Examine how wind arrive and what rain is expected at a particular region of the country.

5-Understand the differences between southwest monsoon and southeast monsoon.

6-Understand how rainfall influence the growth of vegetation and wildlife in the country and also learn a little about the rain deficient areas, i.e., Deserts.

Map URL: <https://arcg.is/1SHvj0>

Can you better understand the importance of Monsoon in India?

Can you better understand characteristics of rainfall, wind system during the monsoon, arrival and departure of Monsoon?

Can you determine the effect of Rainfall in the whole part of the country?

Teacher Notes

This is a **discovery** type of investigation. Students use live web mapping services in an online Geographic Information System (GIS) and use real data about Monsoon and Rainfall in the World.

Students will investigate four themes of geography in this activity:

1. Patterns of rainfall in India and the division of regions based on rainfall.
2. The regions with high rainfall in India and the type of environment in those locations.
3. The relationship between the rainfall and the greenery of that range.
4. The influence of rainfall on the location, growth, shape, and development of the country.

Students will use several different scales for their analysis—global, regional, and local.

Requirements

1. Laptop or tablet computer, a web browser, and access to the Internet.
2. Ideally, each student works on his or her own computer with a web browser.
3. Alternatively, students could work in teams of two.
4. Another alternative is for the instructor to use 1 computer with a projector in front of the classroom to engage students in questions and dialogue as the lesson is being taught.

Student name

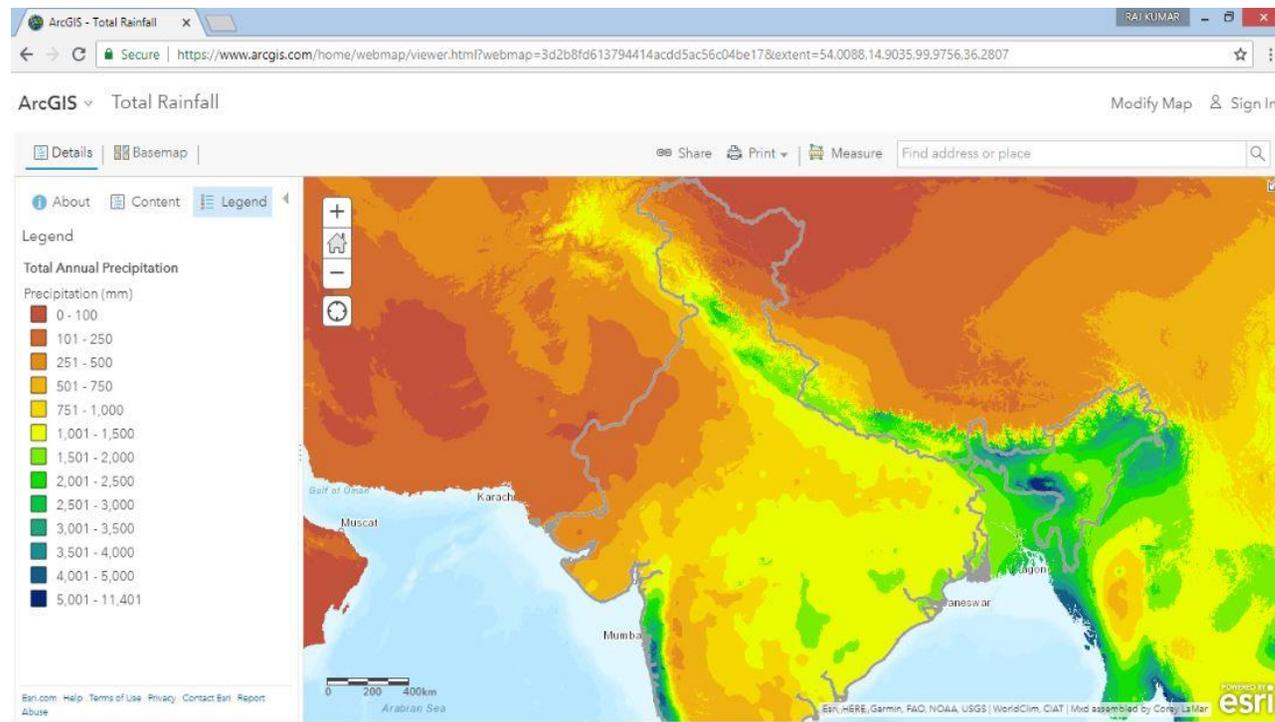
Class

Students have 2 class periods to complete the following investigation.

The investigation is ideally to be completed individually.

Open the Map

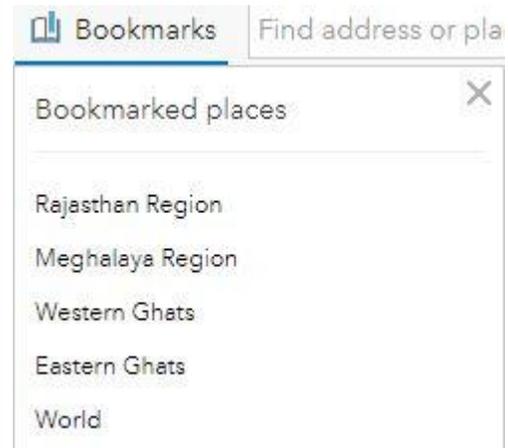
Open a web browser. [Click here to open the map](#). The map you will open is a world map entitled “Rainfall Pattern in the World”, should look similar to the following:



Bookmarks

You will use this live web map that is created with a Geographic Information System (GIS). A GIS provides an excellent way to explore the world and to learn geography at the same time. This map is served via a web based GIS called ArcGIS Online.

Use your mouse to move the map by clicking on the map and moving the mouse. Zoom in and out on the map using the slider bar on the left side of the map. You can also zoom in by pressing the Shift key while dragging a box across the map with the mouse, and letting go with the mouse. Use the Bookmarks to zoom to the locations identified there, as follows:



When you are done interacting with the map, use the bookmark titled "World" to zoom back to the whole world.

Introduction

If you do not stay in desert region of the country, then you must come across rain now and then. Now for your information, rainfall pattern in the country is very different and varies too much from one region to another.

Let's start your investigation by examining the map named as Rainfall Pattern in the world. Rainfall has played a very important role in shaping the world's history and geography. Rainfall in a country shapes its growth. It provides soil with the required moisture and lets crops grow on it. It provides the root for the basic life-form in the form of plants. Everything gets re-energized with the arrival of Monsoon season in India. Rainfalls make agriculture possible and provide a source for home, business, and other forms of life. Monsoon makes many dry rivers of the country come alive and thus provides the root basis for the development of the country.

The whole country is not so much lucky to get good rainfall in Monsoon. Parts of Rajasthan and Gujarat doesn't receive even 50cm of annual rainfall whereas some parts of the Western Ghats receive as many as 5 meters of rainfall. The geography of a region has a huge impact on the amount of rainfall that region of the world receives. And because of these geographical features, they can be studied through the use of web maps in a Geographic Information Systems (GIS) environment.

In this activity, let's first focus on the location and pattern of Rainfall in the World. Rainfall occurs due to the clouds which originates mainly from oceans and terminates where it falls and further activities follow.

Questions

1. From your map, make 2 observations about the location and distribution of rainfall in India.

2. Name 2 states in India which remains deprived of rain every year.

3. Name the states in the country whose regions receives rainfall in the range as follows:

Range	States
0-100 mm	
>2 m	

4. In the map, go to Contents and then check the “Monsoon Data 1” layer. From the layer fill the details of the time by which the following states receives monsoon rains:

Grasslands	Divisions
Rajasthan	
Jharkhand	
Uttar Pradesh	

5. Which part of India does experience the highest diurnal range of temperature and why?

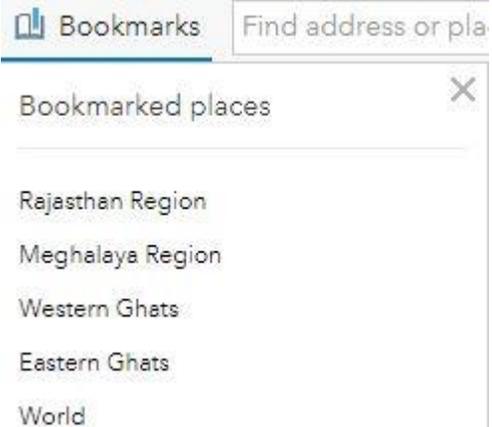
6. Use the map to find out, which winds account for rainfall along the Malabar coast?

7. Use Bookmarks and zoom to Eastern Ghats, why does it rain less in Eastern Ghats compared to the Western Ghats?

8. What are Jet streams and how do they affect the climate of India?

9. Give reasons why “Seasonal reversal of wind direction takes place over the Indian subcontinent”?

10. Using Bookmarks, go to “Himalayan Range” and you will observe that it rains less in the northern direction of the Himalayas. Give reasons why this happens.



Answers

1. Western Ghats and Northeastern part of India receives huge rainfall whereas Rajasthan faces scarcity of Rainfall and thus scarcity of Water.
It rains very less in the northern sides of Himalayas.
2. Rajasthan & Northeastern Jammu & Kashmir.
3. Rajasthan & Northeastern Jammu & Kashmir.
Meghalaya, Karnataka, Maharashtra and Kerala.
4. Rajasthan-> 2nd to 3rd Week of July
Jharkhand-> 2nd Week of June.
UP-> 3rd Week of June.
5. Rajasthan, as it comprises of huge desert regions of Thar Desert.
6. Northeastern Monsoon.
7. This is because the Monsoon winds hits directly the western coast & eastern coast receives the rains later.
8. Jet Streams are narrow belt of high altitude westerly winds in the Troposphere. Its speed varies from 110kmoh in summer to 184kmph in winter.

The western cyclonic disturbance in north and northwestern parts are brought by Westerly Jetstreams.
9. It happens mainly due to the Himalayas.
10. The winds in the Southwestern Monsoon season proceed in the North direction and continues its journey ahead unless they strike the Himalayas after which they start coming back. Thus Himalayas prevent the monsoon winds to enter the Northern parts of itself and thus that part of the world receives less rain.

References

1. NCERT Class 7 Geography Book “Our Environment”-Chapter 9(Life in the Temperate Grasslands).
2. Geospatial Data from ArcGIS sharing portal.



<http://www.esriindia.com/>