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00:00:00,010 --> 00:00:04,040

Huffman: The monsoon is a seasonal wind and rain pattern that was first described

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00:00:04,060 --> 00:00:08,070

over south Asia. You see the clouds

3  
00:00:08,090 --> 00:00:12,080

blossoming here during the summer part of the monsoon.

4  
00:00:12,100 --> 00:00:16,150

For centuries people have known about it, but only recently have we received

5  
00:00:16,170 --> 00:00:19,450

enough data from satellites to really describe what's going on.

6  
00:00:19,450 --> 00:00:24,200

Skofronick-Jackson: What you can see here is moist air that has evaporated from the ocean,

7  
00:00:24,220 --> 00:00:28,270

coming across India and providing rainfall, driving the monsoon

8  
00:00:28,290 --> 00:00:32,410

season. The great thing about GPM is that it allows us

9  
00:00:32,430 --> 00:00:36,430

to see precipitating systems as a whole, over land and

10  
00:00:36,450 --> 00:00:40,530

oceans, and then as they transition from one boundary to the next.

11  
00:00:40,550 --> 00:00:44,680

Huffman: All this rainfall drives soil moisture over land. It's

12  
00:00:44,700 --> 00:00:48,720

beneficial because it promotes the economic activity that people depend on,

13  
00:00:48,740 --> 00:00:52,820

for example, agriculture. As well it fills the rivers,

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00:00:52,840 --> 00:00:56,990

which provides water for human activity and the natural environment, as well as

15

00:00:57,010 --> 00:01:01,050

transportation. If the rivers get too full,

16

00:01:01,070 --> 00:01:05,160

of course, it becomes flooding. At first the floods you see here are fairly

17

00:01:05,180 --> 00:01:09,180

minor and broad-scale but then they concentrate in the few wiggly lines

18

00:01:09,200 --> 00:01:13,240

which are the river basins, for example, in central eastern China.

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00:01:13,260 --> 00:01:17,360

Skofronick-Jackson: In mountainous regions

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00:01:17,380 --> 00:01:21,380

when the ground becomes saturated due to heavy rains it can lead to

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00:01:21,400 --> 00:01:25,450

landslides. Landslides kill thousands of

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00:01:25,470 --> 00:01:29,580

people every year and are primarily triggered by rainfall. They

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00:01:29,600 --> 00:01:33,610

are especially common in the Himalayan region each monsoon season.

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00:01:33,630 --> 00:01:37,690

Huffman: One really cool way to look at the monsoon

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00:01:37,710 --> 00:01:41,810

is to do a split-screen and look at the summer and the winter at the same time.

26  
00:01:41,830 --> 00:01:45,860  
In the summer the wind is blowing onshore, bringing

27  
00:01:45,880 --> 00:01:49,990  
the moist rain-laden air into the continent. In the

28  
00:01:50,010 --> 00:01:54,170  
winter time, it blows off the continent.  
Skofronick-Jackson: Now those winds are

29  
00:01:54,190 --> 00:01:57,830  
basically driven by temperature differences between the ocean and the land.

30  
00:01:57,830 --> 00:02:02,400  
And where the land is nice and warm, the air expands and it draws

31  
00:02:02,420 --> 00:02:06,410  
in the moist precipitation from the ocean waters, but in the winter

32  
00:02:06,430 --> 00:02:10,500  
time, it's very cold and you can see that the moisture then it goes

33  
00:02:10,520 --> 00:02:14,660  
from the continent back into the oceans. Over the past fifty

34  
00:02:14,680 --> 00:02:18,700  
years or so, satellites have been used to measure precipitation all around

35  
00:02:18,720 --> 00:02:22,810  
our Earth. With that dataset we're able to understand

36  
00:02:22,830 --> 00:02:26,970  
that monsoons occur not only in south Asia and India,

37  
00:02:26,990 --> 00:02:31,020  
but in other parts of the world as well.  
Huffman: For example, Africa, where the

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00:02:31,040 --> 00:02:35,060

temperature gradient is between the Atlantic Ocean and the Sahara Desert, the

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00:02:35,080 --> 00:02:39,220

wind blows from the moist Atlantic Ocean onto west Africa

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00:02:39,240 --> 00:02:43,290

providing the moisture for the precipitation. Some of these westward

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00:02:43,310 --> 00:02:47,410

moving storms provoke hurricanes over the Atlantic that occasionally make it to

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00:02:47,430 --> 00:02:51,430

the U.S. Southwestern North America also has a summertime

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00:02:51,450 --> 00:02:55,490

monsoon. You see high soil moisture in regions where there's a lot

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00:02:55,510 --> 00:02:59,600

of precipitation in western Mexico, and later in the season this extends up

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00:02:59,620 --> 00:03:03,640

into the southwestern U.S. And the Southern Hemisphere has

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00:03:03,660 --> 00:03:07,700

a monsoon as well. This occurs in the Northern Hemisphere winter,

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00:03:07,720 --> 00:03:11,840

which is the Southern Hemisphere summer when Australia is warmer

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00:03:11,860 --> 00:03:15,880

than the ocean to the north.

Skofronick-Jackson: Having a better

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00:03:15,900 --> 00:03:19,970

understanding of the global water cycle and monitoring changes over time