1
00:00:01,730 --> 00:00:04,910
NASA scientists have performed the first multi-year study

2
00:00:04,930 --> 00:00:08,450
using satellite data to measure the 3-D distribution of dust

3
00:00:08,470 --> 00:00:11,810
that travels from the Sahara Desert to the Amazon rainforest.

4
00:00:12,400 --> 00:00:14,810
The Sahara is the world’s largest desert.

5
00:00:14,830 --> 00:00:17,480
At more than 3 million square miles,

6
00:00:17,500 --> 00:00:20,510
it’s almost the size of the continental United States.

7
00:00:21,130 --> 00:00:23,950
Each year, Saharan dust is lifted from the ground,

8
00:00:23,970 --> 00:00:27,780
and transported by winds on a 3000-mile journey

9
00:00:27,800 --> 00:00:29,510
across the Atlantic Ocean.

10
00:00:30,000 --> 00:00:32,350
A portion of the dust collects in the Amazon basin

11
00:00:32,370 --> 00:00:35,180
—the largest rainforest on the planet.

12
00:00:35,730 --> 00:00:37,680
Although dust particles are small,

13
00:00:37,700 --> 00:00:41,010

no larger than around a tenth of the width of a human hair,

14
00:00:41,030 --> 00:00:44,310
they form massive plumes that can be seen from space.

15
00:00:45,130 --> 00:00:48,150
NASA’s CALIPSO satellite was launched in 2006

16
00:00:48,170 --> 00:00:50,750
to study the vertical structure of clouds and particles

17
00:00:50,770 --> 00:00:52,410
in Earth’s atmosphere.

18
00:00:52,430 --> 00:00:56,780
CALIPSO observations from 2007 through 2013

19
00:00:56,800 --> 00:00:58,410
show that on average,

20
00:00:58,430 --> 00:01:03,410
182 million tons of dust leaves Africa each year.

21
00:01:03,430 --> 00:01:06,110
Of this amount, about 27 million tons

22
00:01:06,130 --> 00:01:08,310
is deposited in the Amazon basin.

23
00:01:08,330 --> 00:01:11,480
Sahara dust contains phosphorus,

24
00:01:11,500 --> 00:01:14,380
which is an important nutrient for plants.

25
00:01:14,400 --> 00:01:19,280
In the tropic region, the phosphorus is quite limited.

26
00:01:19,300 --> 00:01:22,350
So it’s important to estimate how much dust

27
00:01:22,370 --> 00:01:25,650
from the desert is transported to the Amazon.

28
00:01:25,670 --> 00:01:29,110
The study shows Saharan dust adds phosphorous to the soils

29
00:01:29,130 --> 00:01:30,810
that help compensate for losses

30
00:01:30,830 --> 00:01:33,310
due to surface runoff and floods.

31
00:01:33,330 --> 00:01:36,350
However, the amount of dust transported to the Amazon

32
00:01:36,370 --> 00:01:38,610
changes from year to year.

33
00:01:38,630 --> 00:01:42,350
According to the study, this variation is closely associated

34
00:01:42,370 --> 00:01:44,550
with changes in rainfall in the Sahel,

35
00:01:44,570 --> 00:01:47,980
a belt of semi-arid land just south of the Sahara.

36
00:01:48,000 --> 00:01:51,450
When the Sahel was dry, the dust transport to the Amazon

37
00:01:51,470 --> 00:01:53,510
in the next year would increase.

38
00:01:53,530 --> 00:01:54,980

When it was wet,

39
00:01:55,000 --> 00:01:57,950
dust transport would decrease.

40
00:01:57,970 --> 00:02:02,550
Using satellites to get a clear picture of dust is important

41
00:02:02,570 --> 00:02:06,750
for understanding, and eventually using computers to model