



1  
00:00:00,150 --> 00:00:04,300

[music]

2  
00:00:04,320 --> 00:00:08,500

Narrator: Pulses of laser light. 300,000 per second

3  
00:00:08,520 --> 00:00:12,570

each one represented by a single leaf.

4  
00:00:16,770 --> 00:00:20,980

Flying above a protected area of a Brazilian rainforest,

5  
00:00:21,000 --> 00:00:25,040

NASA scientists measure changes in the canopy to understand how climate change affects

6  
00:00:25,060 --> 00:00:29,260

the amount of carbon stored in the Amazon's mighty trees.

7  
00:00:29,280 --> 00:00:33,460

They flew the same transect of the forest three times over three years,

8  
00:00:33,480 --> 00:00:37,650

first comparing two fairly normal weather years, 2013 and 2014,

9  
00:00:37,670 --> 00:00:41,840

and then surveying again in 2016,

10  
00:00:41,860 --> 00:00:46,030

after a severe El Niño drought.

11  
00:00:46,050 --> 00:00:50,060

With trees more than 16 stories tall, airborne measurements capture changes

12  
00:00:50,080 --> 00:00:54,260

in forest structure not possible from the ground or from space.

13  
00:00:54,280 --> 00:00:58,370

Lighter areas, seen falling away here,

14

00:00:58,390 --> 00:01:02,450

represent limbs and whole trees crashing to the ground

15

00:01:02,470 --> 00:01:06,690

as a result of storms and environmental stress

16

00:01:06,710 --> 00:01:10,890

As they fall, they take other trees with them.

17

00:01:10,910 --> 00:01:14,970

In collaboration with Brazilian scientists,

18

00:01:14,990 --> 00:01:19,140

the team also conducted ground surveys to measure the woody material

19

00:01:19,160 --> 00:01:23,310

on the forest floor. They found that

20

00:01:23,330 --> 00:01:27,640

80% of the carbon losses came from the death of larger trees.

21

00:01:27,660 --> 00:01:31,830

But surprisingly, large trees were not hurt comparatively more by the drought

22

00:01:31,850 --> 00:01:35,940

than were smaller trees, as had been previously suspected.

23

00:01:35,960 --> 00:01:40,120

The team also surveyed areas of forest impacted by logging,

24

00:01:40,140 --> 00:01:44,310

where even more dramatic changes can be seen.

25

00:01:44,330 --> 00:01:48,390

Researchers will continue to analyze

26

00:01:48,410 --> 00:01:52,560

the changing climate and human activity affect rainforests