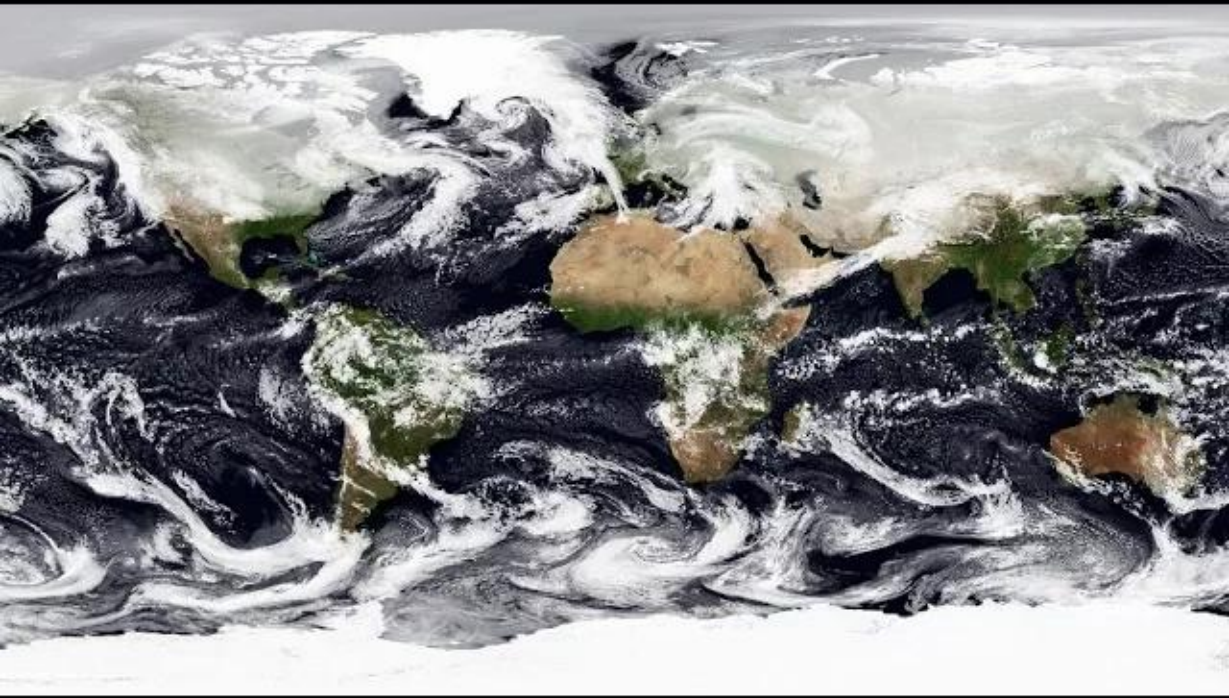

1
00:00:00,434 --> 00:00:03,303
Hidden within and beneath
the swirling clouds on Earth's

2
00:00:03,303 --> 00:00:07,307
surface are different forms of
precipitation from drizzles,

3
00:00:07,307 --> 00:00:09,977
monsoons, hurricanes, to
blizzards.

4
00:00:09,977 --> 00:00:13,380
Now, with a new generation of
satellites, we can see through

5
00:00:13,380 --> 00:00:17,217
the clouds better than ever
before. NASA and the Japan

6
00:00:17,217 --> 00:00:20,854
Aerospace Exploration
Agency lead a constellation of

7
00:00:20,854 --> 00:00:23,524
satellites, called the
Global Precipitation Measurement

8
00:00:23,524 --> 00:00:27,828
mission, or GPM, that
measures all precipitation.

9
00:00:27,828 --> 00:00:31,732
One spacecraft, the GPM
Core Observatory, tunes the

10
00:00:31,732 --> 00:00:33,934
constellation to one consistent
note,

11
00:00:33,934 --> 00:00:36,603
like an oboe tuning
an orchestra.

12
00:00:36,603 --> 00:00:40,941
If we speed things up to around
two seconds per day, a seamless

13
00:00:40,941 --> 00:00:45,112
map of precipitation emerges
and patterns start to form.

14
00:00:45,112 --> 00:00:49,583
These patterns give us vital
information on where, when and

15
00:00:49,583 --> 00:00:52,920
how much precipitation moves
around the world and it's the

16
00:00:52,920 --> 00:00:57,591
most detailed and worldwide view
of falling rain and snow ever

17
00:00:57,591 --> 00:01:01,895
created. Red shows high
rainfall; yellow and green shows

18
00:01:01,895 --> 00:01:03,130
medium to low.

19
00:01:03,130 --> 00:01:07,000
Snow is shown in blues near the
top and bottom depending on the

20
00:01:07,000 --> 00:01:07,568
season.

21
00:01:07,568 --> 00:01:10,938

This is the first time it
can be measured globally.

22
00:01:10,938 --> 00:01:14,741
Around the Equator lies a
persistent band of the heaviest

23
00:01:14,741 --> 00:01:15,776
rainfall.

24
00:01:15,776 --> 00:01:19,746
The sun is most intense here and
causes more water to evaporate.

25
00:01:19,746 --> 00:01:23,083
The rich source of water
vapor in this region fuels many

26
00:01:23,083 --> 00:01:26,987
tropical storms, and feeds heavy
monsoon rainfall and tropical

27
00:01:26,987 --> 00:01:27,921
rainforests.

28
00:01:27,921 --> 00:01:31,658
GPM can also see the
driest places on Earth.

29
00:01:31,658 --> 00:01:35,896
Just above and below the
Equator, large-scale sinking air

30
00:01:35,896 --> 00:01:39,299
compresses and warms as it
falls, and thus hinders rain

31
00:01:39,299 --> 00:01:40,500
formation.

32
00:01:40,500 --> 00:01:44,471
These areas give rise to the
majority of the world's deserts.

33
00:01:44,471 --> 00:01:47,207
Smaller regional
events can also be seen.

34
00:01:47,207 --> 00:01:50,844
Scientists can follow the track
of an individual storm almost

35
00:01:50,844 --> 00:01:53,213
anywhere on the globe, and
monitor how it develops,

36
00:01:53,213 --> 00:01:55,749
evolves, and intensifies.

37
00:01:55,749 --> 00:01:58,719
Tracking storms is also
important to better understand

38
00:01:58,719 --> 00:02:02,456
and anticipate natural disasters
such as landslides and floods.

39
00:02:02,456 --> 00:02:06,259
For a more complete picture
of global precipitation, other

40
00:02:06,259 --> 00:02:09,563
parts of the climate system need
to be studied, like sea surface

41
00:02:09,563 --> 00:02:10,497
temperature.

42
00:02:10,497 --> 00:02:13,600

These temperatures and
precipitation are closely

43
00:02:13,600 --> 00:02:14,468
connected.

44
00:02:14,468 --> 00:02:17,804
When these temperatures change,
precipitation patterns tend to

45
00:02:17,804 --> 00:02:21,608
change as well; warm ocean
temperatures can cause more

46
00:02:21,608 --> 00:02:25,145
moisture-rich air to rise
and develop into rainstorms.

47
00:02:25,145 --> 00:02:28,081
Weather events aren't just
influenced by temperatures;

48
00:02:28,081 --> 00:02:30,350
winds also play a role.

49
00:02:30,350 --> 00:02:32,152
Winds can drive
where rainstorms move.

50
00:02:32,152 --> 00:02:36,023
But winds can also act
like a mixer stirring ocean

51
00:02:36,023 --> 00:02:37,224
temperatures.

52
00:02:37,224 --> 00:02:41,461
Everything in the atmosphere
is interconnected and with GPM

53
00:02:41,461 --> 00:02:44,698
observations, scientists can
analyze how different factors

54
00:02:44,698 --> 00:02:48,435
influence global precipitation
patterns in order to better