1
00:00:00,000 --> 00:00:05,000
VO: Launched from Japan on February 27,

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00:00:05,000 --> 00:00:09,070
2014, the NASA/JAXA Global Precipitation Measurement mission, or GPM,

3
00:00:09,070 --> 00:00:13,070
has changed the way we see precipitation. It has

4
00:00:13,070 --> 00:00:17,070
provided unprecedented three-dimensional views of everything from

5
00:00:17,070 --> 00:00:21,070
light rain to intense thunderstorms. To mark its five years, we're looking

6
00:00:21,070 --> 00:00:25,070
back at five big moments in GPM's history of observing storms.

7
00:00:25,070 --> 00:00:29,070
[Music]

8
00:00:29,070 --> 00:00:33,070
VO: Not long after its launch in 2014, the GPM Core

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00:00:33,070 --> 00:00:37,070
satellite captured Super Typhoon Vongfong as it headed for Japan.

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00:00:37,070 --> 00:00:41,070
Braun: Super Typhoon Vongfong was one of the first Category 5

11
00:00:41,070 --> 00:00:45,070
intensity cyclones that GPM was able to observe.
VO: The radar

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00:00:45,070 --> 00:00:49,070
data revealed a clear eyewall with bands of rain encircling it, forming a

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00:00:49,070 --> 00:00:53,070
secondary eyewall. GPM was able to observe Vongfong as it

14
00:00:53,070 --> 00:00:57,000
weakened.
Braun: So the reason that Vongfong was weakening at this time

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00:00:57,000 --> 00:01:01,000
is what we refer to as an eyewall replacement cycle. So those bands outside

16
00:01:01,000 --> 00:01:05,070
of the eyewall, forming a circle. They essentially cut off the inflow to

17
00:01:05,070 --> 00:01:09,000
the storm. [Music]

18
00:01:09,000 --> 00:01:13,000
VO: Hurricane Harvey slammed into Texas and

19
00:01:13,000 --> 00:01:17,000
Louisiana in August 2017, dumping feet of rain,

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00:01:17,000 --> 00:01:21,000
making it the wettest tropical cyclone on record in the United States.

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00:01:21,000 --> 00:01:25,000
GPM was able to see the full structure of the hurricane beyond

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00:01:25,000 --> 00:01:29,000
the reach of ground-based radars.
Huffman: As Harvey perched over Houston,

23
00:01:29,000 --> 00:01:33,000
it became highly asymmetric with a large area of rainfall to the north

24
00:01:33,000 --> 00:01:37,070
and almost no rainfall to the south.
VO: The GPM mission was able to observe

25
00:01:37,070 --> 00:01:41,070
the historic rainfall estimates over land and ocean, shedding light

26
00:01:41,070 --> 00:01:45,070
on the structure and magnitude of the storm’s impacts.

27
00:01:45,070 --> 00:01:49,070
[Music]

28
00:01:49,070 --> 00:01:53,070
VO: Later in the 2017 Atlantic Hurricane season, GPM was able to see

29
00:01:53,070 --> 00:01:57,000
the evolution of Hurricane Ophelia.
Braun: What was interesting about Ophelia

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00:01:57,000 --> 00:02:01,070
was the fact that it formed sort of from a decaying extratropical frontal system,

31
00:02:01,070 --> 00:02:05,070
what we call a tropical transition, going from an extratropical system to a tropical

32
00:02:05,070 --> 00:02:09,070
one. It managed to intensify up to a Category 3

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00:02:09,070 --> 00:02:13,000
hurricane in the eastern Atlantic, and this was the farthest east that we’ve had a storm

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00:02:13,000 --> 00:02:17,070
of that intensity in the satellite record.

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00:02:17,070 --> 00:02:21,070
VO: Later, Ophelia raced off to the northeast, bringing severe winds to the United Kingdom

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00:02:21,070 --> 00:02:25,070
and Ireland. [Music]

37

00:02:25,070 --> 00:02:29,070
VO: On January 4, 2018, a large snowstorm

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00:02:29,070 --> 00:02:33,070
rapidly intensified as it moved from the southeastern U.S. up

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00:02:33,070 --> 00:02:37,070
the east coast.
Braun: In fact it intensified so rapidly in terms of the drop of

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00:02:37,070 --> 00:02:41,070
pressure at the center it was called a “bomb cyclone” and intensified about as

41
00:02:41,070 --> 00:02:45,070
much as you’d see with an intense hurricane.
VO: GPM clearly depicted

42
00:02:45,070 --> 00:02:49,070
the transition from rain to snow, shown here as the rain layer

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00:02:49,070 --> 00:02:53,070
in green, yellow and red becomes shallower and thinner as it progresses

44
00:02:53,070 --> 00:02:57,070
northward into snow, show in blue.

45
00:02:57,070 --> 00:03:01,070
[Music]
VO: The GPM mission

46
00:03:01,070 --> 00:03:05,070
joins together data from an international satellites to create a

47
00:03:05,070 --> 00:03:09,070
global picture of precipitation in the Integrated Multi-satellitE

48
00:03:09,070 --> 00:03:13,070
Retrievals for GPM, or IMERG for short.
Huffman: The great thing about

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00:03:13,070 --> 00:03:17,070
IMERG is that the fine scale, in space and time, allows

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00:03:17,070 --> 00:03:21,000
you to really see the details, and they flow smoothly from image to the next.

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00:03:21,000 --> 00:03:25,000
When you look at this particular week of IMERG, you see some very general patterns:

52
00:03:25,000 --> 00:03:29,070
You see the high precipitation in the tropics, lower

53
00:03:29,070 --> 00:03:33,000
precipitation to the north and south of that, and then the storm tracks in midlatitudes.

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00:03:33,000 --> 00:03:37,070
VO: For five years, GPM data has advanced our understanding

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00:03:37,070 --> 00:03:41,070
of how hurricanes form and intensify, demonstrated how individual

56
00:03:41,070 --> 00:03:45,070
raindrops are distributed inside storms, and produced

57
00:03:45,070 --> 00:03:49,070
unparalleled global coverage of precipitation across land and sea.