
MHFD
FIRE POLICE

1
00:00:00,010 --> 00:00:04,100
[Music, wind and rain]

2
00:00:04,120 --> 00:00:08,140
Voice: This is what we

3
00:00:08,160 --> 00:00:12,310
call severe damage.

4
00:00:12,330 --> 00:00:16,360
This is the bridge out of town, and we're not going anywhere.

5
00:00:24,470 --> 00:00:20,400
[rushing water]

6
00:00:24,490 --> 00:00:28,510
Voice: A woman was stranded here all day long through the storm...

7
00:00:28,530 --> 00:00:32,520
[bridge collapses]
Voice: Oh my God!

8
00:00:32,540 --> 00:00:36,550
Tropical Storm Irene bears down on New England. In Vermont

9
00:00:36,570 --> 00:00:40,570
the storm pushes up agains the higher terrain, and the rain intensifies.

10
00:00:40,590 --> 00:00:44,630
This is the worst flooding Vermont has seen in nearly

11
00:00:44,650 --> 00:00:48,680
75 years. Tropical cyclones,

12
00:00:48,700 --> 00:00:52,750
a general term for hurricanes, typhoons, and tropical storms like Irene,

13

00:00:52,770 --> 00:00:56,810
don't just stick to the tropics. These storms can charge

14
00:00:56,830 --> 00:01:00,850
northward and wreak havoc in areas that normally wouldn't see

15
00:01:00,870 --> 00:01:04,880
this kind of extreme weather. Satellites provide us with

16
00:01:04,900 --> 00:01:08,920
near real-time information about the intensity of storms

17
00:01:08,940 --> 00:01:12,930
and where they're headed. Since its launch in 1997,

18
00:01:12,950 --> 00:01:16,950
TRMM, the Tropical Rainfall Measuring Mission, has remained a

19
00:01:16,970 --> 00:01:21,000
gold standard in collecting global rainfall data on storms.

20
00:01:21,020 --> 00:01:25,060
Scott Braun: TRMM's usage for hurricanes has also been a major application.

21
00:01:25,080 --> 00:01:29,110
Operational agencies use it to get

22
00:01:29,130 --> 00:01:33,170
center fixes on storms to monitor how the internal structure

23
00:01:33,190 --> 00:01:37,220
of a storm is changing and how that might relate to the potential for

24
00:01:37,240 --> 00:01:41,250
a storm to either intensify or weaken.
And while TRMM provides essential information

25
00:01:41,270 --> 00:01:45,300

on cyclones for tropical areas, for regions like New England,

26
00:01:45,320 --> 00:01:49,340
TRMM simply falls short.
Braun: We knew going into TRMM that there

27
00:01:49,360 --> 00:01:53,360
were going to be some limitations. The primary one being its relatively low

28
00:01:53,380 --> 00:01:57,450
sensitivity so that it would not be able to get the very low rainfall

29
00:01:57,470 --> 00:02:01,550
rates that you might see up at higher latitudes.

30
00:02:01,570 --> 00:02:05,600
Carlisle: So part of what GPM is supposed to do was just continue those measurements,

31
00:02:05,620 --> 00:02:09,650
but also GPM is to improve those measurements by being able to

32
00:02:09,670 --> 00:02:13,690
for example, measure precipitation over a wider swath

33
00:02:13,710 --> 00:02:17,780
of the Earth. TRMM is just at about 35 degrees,

34
00:02:17,800 --> 00:02:21,820
GPM gets more of the Earth in its measurements, going

35
00:02:21,840 --> 00:02:25,840
all the way into southern Canada, for example.
The Global Precipitation

36
00:02:25,860 --> 00:02:29,870
Measurement mission, or GPM, is a constellation of satellites

37
00:02:29,890 --> 00:02:33,890

unified by the GPM Core Spacecraft that will provide a global picture

38
00:02:33,910 --> 00:02:37,970
of rain and snow every three hours. When GPM launches in

39
00:02:37,990 --> 00:02:42,040
2014, it will greatly improve upon some of the limitations

40
00:02:42,060 --> 00:02:46,090
of TRMM. In addition to measuring a wider swath of the globe,

41
00:02:46,110 --> 00:02:50,210
the GPM Core Spacecraft will carry more advanced instruments with

42
00:02:50,230 --> 00:02:54,260
greater sensitivity. There's the GPM Microwave Imager, or

43
00:02:54,280 --> 00:02:58,340
the GMI, a radiometer that will use 13 microwave

44
00:02:58,360 --> 00:03:02,370
channels to capture precipitation intensities and horizontal

45
00:03:02,390 --> 00:03:06,410
patterns. Then there's the Dual-frequency Precipitation Radar,

46
00:03:06,430 --> 00:03:10,450
or the DPR. That uses two frequencies to

47
00:03:10,470 --> 00:03:14,470
visualize in 3D the precipitation structure from the cloud down

48
00:03:14,490 --> 00:03:18,540
to the surface.
Braun: With GPM we have the opportunity now

49
00:03:18,560 --> 00:03:22,630
with more advanced technologies to improve upon TRMM

50
00:03:22,650 --> 00:03:26,690
by having that second frequency and being able to measure

51
00:03:26,710 --> 00:03:30,760
the lighter rainfall and produce a more accurate rainfall estimate

52
00:03:30,780 --> 00:03:34,810
by having the two combined.
With GPM's more sensitive instruments

53
00:03:34,830 --> 00:03:38,850
and wider coverage of the globe, we can more accurately profile a tropical

54
00:03:38,870 --> 00:03:42,890
cyclone, predicting where they're likely to form, how intense

55
00:03:42,910 --> 00:03:46,920
they're likely to become and tracking the path they'll take

56
00:03:46,940 --> 00:03:50,960
so that agencies can make better decisions to help get people out

57
00:03:50,980 --> 00:03:55,020
of harm's way.
[music]