1
00:00:00,190 --> 00:00:04,200
[Narrator]: Hurricane Katrina.

2
00:00:04,220 --> 00:00:08,230
One of the most devastating natural disasters in US history.

3
00:00:08,250 --> 00:00:12,340
More than 1800 people lost their lives

4
00:00:12,360 --> 00:00:16,390
while countless others lost homes and livelihoods.

5
00:00:16,410 --> 00:00:20,460
Five years later, the waters have receded but

6
00:00:20,480 --> 00:00:24,530
Katrina's legacy remains. Why

7
00:00:24,550 --> 00:00:28,640
did Katrina become a category 5 storm in the Gulf of Mexico?

8
00:00:28,660 --> 00:00:32,750
And what made it weaken before landfall? It's

9
00:00:32,770 --> 00:00:36,780
questions like this that NASA researchers hope to answer this hurricane season.

10
00:00:36,800 --> 00:00:40,840
The Genesis and Rapid Intensification Processes

11
00:00:40,860 --> 00:00:45,020
mission, or GRIP, is a field experiment that looks at

12
00:00:45,040 --> 00:00:49,060
how tropical storms form and develop into major hurricanes.

13
00:00:49,080 --> 00:00:53,090

[Kakar]: This experiment is designed not only

14
00:00:53,110 --> 00:00:57,100
to help the experts better understand which of the tropical disturbances

15
00:00:57,120 --> 00:01:01,130
will develop into tropical storms or hurricanes, but also help them

16
00:01:01,150 --> 00:01:05,190
predict which ones will intesify to monsters and

17
00:01:05,210 --> 00:01:09,210
which ones will fizzle out rapidly.

18
00:01:09,230 --> 00:01:13,260
[Narrator]: During the 2010 hurricane season, NASA deplyed its piloted

19
00:01:13,280 --> 00:01:17,300
DC-8 and WB-57 and unmanned

20
00:01:17,320 --> 00:01:21,320
Global Hawk aircraft in a massive effort to collect as much

21
00:01:21,340 --> 00:01:25,520
data as possible, arming hurricane researchers with the

22
00:01:25,540 --> 00:01:29,560
information needed to predict the growth and intensification of

23
00:01:29,580 --> 00:01:33,610
hurricanes. [Braun]: With the DC-8 and in particular the wind LIDAR

24
00:01:33,630 --> 00:01:37,640
we're going to get continuous wind measurements in the environment of the storm, something that we've never

25
00:01:37,660 --> 00:01:41,690
been able to get before. With the Global Hawk, the

26
00:01:41,710 --> 00:01:45,740
expectation is that because of its 30 hour duration, flight duration,

27
00:01:45,760 --> 00:01:49,880
we're going to be able to be out over storms for up to 20 hours or so, which is

28
00:01:49,900 --> 00:01:54,590
about 2-4 times longer than what we'd be able to do with conventional aircraft.

29
00:01:54,610 --> 00:01:58,620
When you're out there only getting very brief looks for short periods of time

30
00:01:58,640 --> 00:02:02,630
it's very easy to miss those critical events. And so, with GRIP

31
00:02:02,650 --> 00:02:06,650
we think we have a very good chance of being able to see those processes

32
00:02:06,670 --> 00:02:10,680
much more easily than we've been able to do in the past.

33
00:02:10,700 --> 00:02:14,700
[Narrator]: Each aircraft brings its own set of expertise. The DC-8,

34
00:02:14,720 --> 00:02:18,740
stationed in Ft. Lauderdale, carries NASA researchers into

35
00:02:18,760 --> 00:02:22,820
hurricanes, allowing them to study the storm from the inside out.

36
00:02:22,840 --> 00:02:26,850
It is capable of reaching altitudes of 42,000

37
00:02:26,870 --> 00:02:30,870
feet and is helping scientists with sensor development and verification

38
00:02:30,890 --> 00:02:34,900

and studies of the planet's surface and atmosphere.

39
00:02:34,920 --> 00:02:38,930
The Global Hawk- This remotely piloted

40
00:02:38,950 --> 00:02:44,770
aircraft, stationed out of California, is capable of flying at

41
00:02:44,790 --> 00:02:48,810
60,000 feet and is providing information on lightning, wind speed and other

42
00:02:48,830 --> 00:02:52,880
environmental factors in a tropical cyclone.

43
00:02:52,900 --> 00:02:56,920
The WB-57, stationed in Houston, Texas,

44
00:02:56,940 --> 00:03:00,970
is a high altitude, piloted airplane capable of

45
00:03:00,990 --> 00:03:04,990
reaching the dizzying height of 65,000 feet. It's

46
00:03:05,010 --> 00:03:09,200
instruments retrieve data on the upper atmosphere.

47
00:03:09,220 --> 00:03:13,230
This fleet of specially outfitted aircraft will give researchers an

48
00:03:13,250 --> 00:03:17,240
unprecedented look inside the mechanics of storms.

49
00:03:17,260 --> 00:03:21,270
[Braun]: The benefit of studying hurricanes with so many instruments at once is that it

50
00:03:21,290 --> 00:03:25,300
gives us a more complete description of the atmosphere, both within the storm

51
00:03:25,320 --> 00:03:29,340
and in the environment. Within the storm, we want information

52
00:03:29,360 --> 00:03:33,390
not only on the winds within the storm, but also the temperature, humidity,

53
00:03:33,410 --> 00:03:37,440
and precipitation in the eye, the eye wall, and the rain bands.

54
00:03:37,460 --> 00:03:41,450
All that information is critical to understanding how the storms

55
00:03:41,470 --> 00:03:45,520
evolve. [Narrator]: GRIP will also gather data from a much

56
00:03:45,540 --> 00:03:49,540
higher vantage point, outer space. The TRMM, Aqua,

57
00:03:49,560 --> 00:03:53,560
Terra, and Cloudsat satellites provide data to scientists

58
00:03:53,580 --> 00:03:57,580
on Earth, giving them a comprehensive look at storms

59
00:03:57,600 --> 00:04:01,610
from different perspectives. [Halverson]: GRIP is designed

60
00:04:01,630 --> 00:04:05,700
to take the latest technologies that NASA can bring to bare.

61
00:04:05,720 --> 00:04:09,740
Satellites, aircraft that fly in the storm, aircraft that fly over the storm,

62
00:04:09,760 --> 00:04:13,850
systems on the ground, let's put it all out there for 6 weeks and

63
00:04:13,870 --> 00:04:17,910

see what we can learn about the physics of these storms. [Narrator]: The flights

64
00:04:17,930 --> 00:04:21,960
conducted through GRIP this hurricane season will undoubtedly provide

65
00:04:21,980 --> 00:04:26,000
vital information on the lifecycle of hurricanes.

66
00:04:26,020 --> 00:04:30,030
This information will help scientists predict the birth of potential hurricanes

67
00:04:30,050 --> 00:04:34,060
and understand why some tropical cyclones can go from a