1
00:00:03,510 --> 00:00:01,750
i'm rob guttrow from nasa's goddard

2
00:00:05,670 --> 00:00:03,520
space flight center and here with me

3
00:00:08,629 --> 00:00:05,680
today is dr jeff halverson he's a

4
00:00:10,629 --> 00:00:08,639
professor at umbc maryland and also a

5
00:00:12,390 --> 00:00:10,639
nasa hurricane research expert good

6
00:00:13,350 --> 00:00:12,400
morning jeff hi rob how you doing good

7
00:00:15,110 --> 00:00:13,360
thanks

8
00:00:17,349 --> 00:00:15,120
we're here to talk about nasa's new

9
00:00:19,269 --> 00:00:17,359
hurricane mission grip we're going to

10
00:00:21,830 --> 00:00:19,279
get a grip on hurricanes here with the

11
00:00:23,429 --> 00:00:21,840
genesis and reintensification processes

12
00:00:25,589 --> 00:00:23,439
mission can you tell us a little bit

13
00:00:27,589 --> 00:00:25,599

about grip please well the grip as you

14
00:00:30,150 --> 00:00:27,599
said it's an acronym for an experiment

15
00:00:32,870 --> 00:00:30,160
that nasa's doing the genesis and rapid

16
00:00:35,190 --> 00:00:32,880
intensification processes on genesis

17
00:00:37,350 --> 00:00:35,200
means birth of hurricanes rapid

18
00:00:39,830 --> 00:00:37,360
intensification means

19
00:00:42,229 --> 00:00:39,840
deepening very quickly here you see

20
00:00:44,150 --> 00:00:42,239
nasa's flying laboratory the dc-8 and

21
00:00:46,229 --> 00:00:44,160
here you see another new aircraft that

22
00:00:48,389 --> 00:00:46,239
nasty's using the global hawk the global

23
00:00:50,389 --> 00:00:48,399
hawk's a drone there's no pilot in it

24
00:00:52,389 --> 00:00:50,399
and it flies at sixty thousand feet and

25
00:00:54,389 --> 00:00:52,399
so we take these high altitude aircraft

26
00:00:56,709 --> 00:00:54,399
we put them in the upper levels of the

27
00:00:58,709 --> 00:00:56,719
hurricane where it's hard to get data

28
00:01:01,750 --> 00:00:58,719
and the global hawk can stay over a

29
00:01:03,189 --> 00:01:01,760
storm for 26 hours that's a long time

30
00:01:05,109 --> 00:01:03,199
and that's going to revolutionize the

31
00:01:07,510 --> 00:01:05,119
way we do hurricane science because now

32
00:01:09,109 --> 00:01:07,520
we can follow a storm as it goes through

33
00:01:11,350 --> 00:01:09,119
all its changes we're not going to miss

34
00:01:13,350 --> 00:01:11,360
a beat on a storm it's going to

35
00:01:15,030 --> 00:01:13,360
revolutionize the way nasa does it now

36
00:01:17,830 --> 00:01:15,040
what's the difference between hurricane

37
00:01:19,350 --> 00:01:17,840
hunters that noah flies and the nasa

38
00:01:20,789 --> 00:01:19,360

grip aircraft mission you know i think

39
00:01:22,710 --> 00:01:20,799
most of you may be familiar with the

40
00:01:24,630 --> 00:01:22,720
hurricane hunters they've been doing

41
00:01:26,870 --> 00:01:24,640
this for years they fly the aircraft

42
00:01:29,350 --> 00:01:26,880
into the storm but they go in at the low

43
00:01:30,950 --> 00:01:29,360
levels right above the ocean 10 000 feet

44
00:01:33,030 --> 00:01:30,960
or so that's a great place to be to

45
00:01:34,630 --> 00:01:33,040
collect data now here you see we're in

46
00:01:37,270 --> 00:01:34,640
the upper levels we're looking down

47
00:01:40,230 --> 00:01:37,280
inside the eye of hurricane earl from

48
00:01:41,429 --> 00:01:40,240
inside the eye at 40 000 feet and

49
00:01:43,510 --> 00:01:41,439
there's a lot of important things that

50
00:01:45,190 --> 00:01:43,520
happen in the upper levels of the storm

51
00:01:47,030 --> 00:01:45,200
satellites can tell us a lot about the

52
00:01:49,590 --> 00:01:47,040
upper levels of the clouds but here this

53
00:01:52,469 --> 00:01:49,600
is a historic picture this is the first

54
00:01:54,149 --> 00:01:52,479
time we took an unpiloted drone over the

55
00:01:56,870 --> 00:01:54,159
remnants of a hurricane that's hurricane

56
00:01:59,350 --> 00:01:56,880
frank over the east pacific and that's

57
00:02:01,350 --> 00:01:59,360
from 60 000 feet there's no pilot in

58
00:02:03,190 --> 00:02:01,360
that plane but we're collecting great

59
00:02:04,709 --> 00:02:03,200
data from the upper levels of the

60
00:02:07,190 --> 00:02:04,719
systems and that's important for

61
00:02:08,869 --> 00:02:07,200
hurricane science now the the global

62
00:02:11,430 --> 00:02:08,879
hawk this is the first time an unmanned

63
00:02:12,869 --> 00:02:11,440

drone has ever been flown into uh

64
00:02:14,869 --> 00:02:12,879
a hurricane exactly correct that's

65
00:02:16,550 --> 00:02:14,879
correct that's right now this mission

66
00:02:20,309 --> 00:02:16,560
runs through the end of september right

67
00:02:22,550 --> 00:02:20,319
and uh on september 2nd we're flying the

68
00:02:24,229 --> 00:02:22,560
unmanned drone is that right are we

69
00:02:25,830 --> 00:02:24,239
going into hurricane earl today we're

70
00:02:27,910 --> 00:02:25,840
going over the top of hurricane earl

71
00:02:29,190 --> 00:02:27,920
this aircraft took off from southern

72
00:02:31,509 --> 00:02:29,200
california

73
00:02:33,830 --> 00:02:31,519
uh very early and now it's out over the

74
00:02:35,350 --> 00:02:33,840
storm it's flying patterns over the top

75
00:02:38,150 --> 00:02:35,360
of the system it's going to stay out

76
00:02:38,949 --> 00:02:38,160
there over that storm for 10 11 hours

77
00:02:40,630 --> 00:02:38,959
and

78
00:02:41,990 --> 00:02:40,640
then it's got to go back to california

79
00:02:43,670 --> 00:02:42,000
and typically how long do hurricane

80
00:02:45,589 --> 00:02:43,680
hunters stay out there hurricane hunters

81
00:02:46,949 --> 00:02:45,599
will go out for six to eight hours and

82
00:02:49,990 --> 00:02:46,959
they've got to come back in because they

83
00:02:52,150 --> 00:02:50,000
need fuel they have crew on board and

84
00:02:53,509 --> 00:02:52,160
you have the crew can only operate a

85
00:02:55,110 --> 00:02:53,519
plane for so long you have what's called

86
00:02:56,790 --> 00:02:55,120
duty hours right what about the

87
00:02:59,190 --> 00:02:56,800
satellites that are supplementing data

88
00:03:02,149 --> 00:02:59,200

to this mission well for many many years

89
00:03:03,990 --> 00:03:02,159
nasa has had satellites up measuring all

90
00:03:06,550 --> 00:03:04,000
aspects of the earth system and

91
00:03:08,470 --> 00:03:06,560
hurricanes are no exception here we see

92
00:03:11,110 --> 00:03:08,480
looking not just at the tops of clouds

93
00:03:12,710 --> 00:03:11,120
but peeling away those clouds a cat scan

94
00:03:14,790 --> 00:03:12,720
right we're taking cat scans of

95
00:03:17,110 --> 00:03:14,800
hurricanes now we're also measuring the

96
00:03:19,030 --> 00:03:17,120
temperature of the skin of the ocean

97
00:03:21,670 --> 00:03:19,040
look at the warm water just waiting for

98
00:03:23,350 --> 00:03:21,680
storms to develop so these are new ways

99
00:03:25,110 --> 00:03:23,360
of looking at systems and here we see

100
00:03:26,630 --> 00:03:25,120
super computer simulations these are

101
00:03:28,390 --> 00:03:26,640
numerical models

102
00:03:30,390 --> 00:03:28,400
mathematical models that take all that

103
00:03:32,949 --> 00:03:30,400
satellite data all that aircraft data

104
00:03:35,589 --> 00:03:32,959
put it in and you run the model and you

105
00:03:37,589 --> 00:03:35,599
learn about the physics of these storms

106
00:03:39,750 --> 00:03:37,599
so nasa's taking this places we have

107
00:03:41,110 --> 00:03:39,760
never been with hurricanes so some of

108
00:03:42,470 --> 00:03:41,120
the factors that we're looking at for

109
00:03:45,589 --> 00:03:42,480
genesis

110
00:03:47,509 --> 00:03:45,599
of a tropical storm would be sea surface

111
00:03:49,030 --> 00:03:47,519
temperatures as you mentioned right what

112
00:03:50,630 --> 00:03:49,040
about the upper level winds the upper

113
00:03:52,789 --> 00:03:50,640

level winds are really important you can

114
00:03:54,789 --> 00:03:52,799
have lots of energy in the ocean and

115
00:03:56,789 --> 00:03:54,799
those clouds bubble up really deep but

116
00:03:59,589 --> 00:03:56,799
if the tops of those clouds get into

117
00:04:01,429 --> 00:03:59,599
strong winds wind shear the tops of the

118
00:04:03,270 --> 00:04:01,439
clouds can literally be blown off the

119
00:04:04,789 --> 00:04:03,280
bottom and you can't get a hurricane

120
00:04:07,350 --> 00:04:04,799
unless you stack everything up

121
00:04:10,229 --> 00:04:07,360
vertically so here you see a satellite

122
00:04:12,710 --> 00:04:10,239
picture of the winds just blowing those

123
00:04:14,470 --> 00:04:12,720
those cloud fragments away to the north

124
00:04:16,629 --> 00:04:14,480
and if you get too much of that that

125
00:04:18,150 --> 00:04:16,639
actually causes a hurricane to weaken

126
00:04:21,270 --> 00:04:18,160
and we have tropical cyclones out there

127
00:04:23,830 --> 00:04:21,280
now like uh fiona and gaston are there

128
00:04:25,670 --> 00:04:23,840
any plans to fly over those storms well

129
00:04:27,909 --> 00:04:25,680
we we have to wait for the storms to get

130
00:04:30,469 --> 00:04:27,919
close enough to where we are where the

131
00:04:32,469 --> 00:04:30,479
dc-8s in fort lauderdale the global

132
00:04:35,430 --> 00:04:32,479
hawks flying out of southern california

133
00:04:37,350 --> 00:04:35,440
and we have a third aircraft the wb-57

134
00:04:39,430 --> 00:04:37,360
which flies at 60 000 feet with two

135
00:04:42,469 --> 00:04:39,440
pilots that was coming out of houston

136
00:04:44,629 --> 00:04:42,479
right but so we let the storms move

137
00:04:46,310 --> 00:04:44,639
towards the west atlantic and then we'll

138
00:04:48,950 --> 00:04:46,320

go hunt them so yes it looks like we're

139
00:04:50,790 --> 00:04:48,960
going to get others fiona gaston maybe

140
00:04:52,629 --> 00:04:50,800
the other storms too

141
00:04:54,230 --> 00:04:52,639
in closing is there anything that you'd

142
00:04:56,790 --> 00:04:54,240
like to say about the grip mission how

143
00:04:59,350 --> 00:04:56,800
unique this is i think it's very unique

144
00:05:01,430 --> 00:04:59,360
uh the fact that we're sending out an

145
00:05:03,670 --> 00:05:01,440
unpiloted vehicle this is where the

146
00:05:05,029 --> 00:05:03,680
revolution is going to take place

147
00:05:07,029 --> 00:05:05,039
now this is going to be the new way to

148
00:05:08,870 --> 00:05:07,039
study hurricanes and we're going to move

149
00:05:10,469 --> 00:05:08,880
all the operations to wallops in the

150
00:05:11,350 --> 00:05:10,479
year and we're going to start flying

151
00:05:14,230 --> 00:05:11,360
these

152
00:05:16,230 --> 00:05:14,240
drones on a regular basis every summer

153
00:05:18,150 --> 00:05:16,240
wow sounds really cool

154
00:05:19,670 --> 00:05:18,160
thank you dr halverson thank you rob