
NASA
EPISODE FOUR:
CHASING CLOUDS

1
00:00:05,510 --> 00:00:03,510
after nearly a decade of planning

2
00:00:08,390 --> 00:00:05,520
this field campaign happened to be here

3
00:00:10,470 --> 00:00:08,400
just as an unusually dry season led to

4
00:00:12,470 --> 00:00:10,480
some of the most intense and large fires

5
00:00:14,870 --> 00:00:12,480
the region had experienced in the last

6
00:00:16,950 --> 00:00:14,880
five years

7
00:00:18,950 --> 00:00:16,960
we came here to look at

8
00:00:19,830 --> 00:00:18,960
the transport of smoke and what smoke

9
00:00:22,070 --> 00:00:19,840
does

10
00:00:25,349 --> 00:00:22,080
in the environment particularly as it

11
00:00:28,150 --> 00:00:25,359
impacts clouds and we had

12
00:00:30,630 --> 00:00:28,160
an amazingly intense

13
00:00:33,030 --> 00:00:30,640

smoke event that carried very high

14
00:00:35,750 --> 00:00:33,040
concentrations of smoke into a place

15
00:00:37,350 --> 00:00:35,760
called the sulu sea

16
00:00:40,549 --> 00:00:37,360
you might be surprised to learn that

17
00:00:43,110 --> 00:00:40,559
fires affect cloud formation and nasa is

18
00:00:45,510 --> 00:00:43,120
studying that dynamic relationship

19
00:00:48,869 --> 00:00:45,520
nasa is a big and capable organization

20
00:00:51,670 --> 00:00:48,879
but earth science is a subject far too

21
00:00:54,150 --> 00:00:51,680
big for one country one agency

22
00:00:56,310 --> 00:00:54,160
to tackle all by itself

23
00:00:57,990 --> 00:00:56,320
and when you can't do it by yourself

24
00:01:00,450 --> 00:00:58,000
you call up your colleagues halfway

25
00:01:17,190 --> 00:01:00,460
across the globe

26
00:01:20,950 --> 00:01:18,710
we're in the philippines to better

27
00:01:24,310 --> 00:01:20,960
understand how tiny particles from smoke

28
00:01:26,630 --> 00:01:24,320
and pollution affect cloud formation

29
00:01:28,789 --> 00:01:26,640
the campaign is called the cloud aerosol

30
00:01:29,990 --> 00:01:28,799
and monsoon processes philippines

31
00:01:31,510 --> 00:01:30,000
experiment

32
00:01:33,590 --> 00:01:31,520
camp x

33
00:01:35,910 --> 00:01:33,600
the two is silent

34
00:01:37,510 --> 00:01:35,920
that's just a joke but the acronym

35
00:01:39,270 --> 00:01:37,520
that's serious

36
00:01:41,429 --> 00:01:39,280
this project has implications for

37
00:01:44,710 --> 00:01:41,439
millions of people

38
00:01:47,749 --> 00:01:44,720

i'm the program scientist for camp x and

39
00:01:50,469 --> 00:01:47,759
while i'm here i'm sort of the decision

40
00:01:51,749 --> 00:01:50,479
maker of last resort if if something

41
00:01:53,429 --> 00:01:51,759
comes up

42
00:01:54,630 --> 00:01:53,439
we caught up with how between meetings

43
00:01:56,469 --> 00:01:54,640
and the hangar

44
00:01:58,870 --> 00:01:56,479
along with jeffrey reed from the naval

45
00:02:00,870 --> 00:01:58,880
research laboratory he's responsible for

46
00:02:02,630 --> 00:02:00,880
overseeing this large collaborative

47
00:02:04,230 --> 00:02:02,640
effort in real time

48
00:02:06,469 --> 00:02:04,240
making sure the team is meeting their

49
00:02:08,389 --> 00:02:06,479
scientific goals while also keeping

50
00:02:10,550 --> 00:02:08,399
researchers from institutions around the

51
00:02:13,510 --> 00:02:10,560
us and the philippines working together

52
00:02:15,750 --> 00:02:13,520
smoothly a critical part of the process

53
00:02:17,190 --> 00:02:15,760
was the relationship built

54
00:02:19,670 --> 00:02:17,200
through time

55
00:02:21,110 --> 00:02:19,680
that relationship enabled us to really

56
00:02:22,630 --> 00:02:21,120
work together

57
00:02:25,030 --> 00:02:22,640
and

58
00:02:26,630 --> 00:02:25,040
think about what would be the questions

59
00:02:29,670 --> 00:02:26,640
that would be relevant to us in the

60
00:02:32,630 --> 00:02:29,680
philippines and in general to the region

61
00:02:34,390 --> 00:02:32,640
i'm gemma teresa narisma and i'm the

62
00:02:36,070 --> 00:02:34,400
executive director of the manila

63
00:02:40,710 --> 00:02:36,080

observatory

64
00:02:43,110 --> 00:02:40,720
the naval research laboratory and a

65
00:02:44,949 --> 00:02:43,120
handful of university partners are using

66
00:02:47,270 --> 00:02:44,959
two research planes and measurements

67
00:02:49,430 --> 00:02:47,280
from a ship to look at the properties of

68
00:02:50,790 --> 00:02:49,440
clouds to improve satellite measurements

69
00:02:53,830 --> 00:02:50,800
in the region

70
00:02:55,509 --> 00:02:53,840
satellites find it difficult to see food

71
00:02:56,790 --> 00:02:55,519
and food this region

72
00:02:58,869 --> 00:02:56,800
and

73
00:03:00,229 --> 00:02:58,879
regional climate models are having a

74
00:03:02,949 --> 00:03:00,239
hard time

75
00:03:05,430 --> 00:03:02,959
capturing these processes

76
00:03:07,270 --> 00:03:05,440
that basically means planes ships and

77
00:03:08,949 --> 00:03:07,280
teams on the ground need to fill in the

78
00:03:11,030 --> 00:03:08,959
missing details

79
00:03:13,589 --> 00:03:11,040
which brings us back to the most intense

80
00:03:16,869 --> 00:03:13,599
fire season in five years

81
00:03:19,830 --> 00:03:16,879
we were able to get the p3 into

82
00:03:21,589 --> 00:03:19,840
that smoke and make

83
00:03:23,670 --> 00:03:21,599
absolutely unique and important

84
00:03:27,430 --> 00:03:23,680
measurements

85
00:03:30,550 --> 00:03:27,440
it's important because if you cannot get

86
00:03:32,949 --> 00:03:30,560
the historical observations in our model

87
00:03:36,550 --> 00:03:32,959
then we're not so certain whether our

88
00:03:38,390 --> 00:03:36,560

climate projections are correct

89
00:03:40,309 --> 00:03:38,400
when the planes aren't flying the

90
00:03:42,550 --> 00:03:40,319
science teams and flight crews take

91
00:03:45,430 --> 00:03:42,560
turns visiting local schools from

92
00:03:47,030 --> 00:03:45,440
elementary up through university

93
00:03:49,509 --> 00:03:47,040
elementary school students can

94
00:03:50,869 --> 00:03:49,519
understand remarkably complicated

95
00:03:53,509 --> 00:03:50,879
concepts

96
00:03:55,190 --> 00:03:53,519
and so it's kind of fun to introduce

97
00:03:57,110 --> 00:03:55,200
introduce them to

98
00:03:59,429 --> 00:03:57,120
things they may not have known or

99
00:04:01,910 --> 00:03:59,439
thought about before and it's remarkable

100
00:04:04,149 --> 00:04:01,920
how quickly they pick up on it

101
00:04:06,149 --> 00:04:04,159
at these schools the scientists are

102
00:04:07,110 --> 00:04:06,159
treated like rock stars

103
00:04:07,990 --> 00:04:07,120
we've

104
00:04:10,789 --> 00:04:08,000
had

105
00:04:12,869 --> 00:04:10,799
just an amazing response from the from

106
00:04:15,910 --> 00:04:12,879
the philippine students

107
00:04:17,030 --> 00:04:15,920
many autographs and more selfies than i

108
00:04:18,629 --> 00:04:17,040
can count

109
00:04:21,430 --> 00:04:18,639
some even said that they want to become

110
00:04:23,830 --> 00:04:21,440
meteorologists themselves to help carry

111
00:04:25,430 --> 00:04:23,840
on the study of our home planet and how

112
00:04:26,830 --> 00:04:25,440
it's changing

113
00:04:29,830 --> 00:04:26,840

i feel

114
00:04:31,990 --> 00:04:29,840
hopeful we're not getting any younger

115
00:04:33,670 --> 00:04:32,000
and the number of atmospheric scientists

116
00:04:35,749 --> 00:04:33,680
in the philippines in the world

117
00:04:38,469 --> 00:04:35,759
particularly in the philippines is quite

118
00:04:39,990 --> 00:04:38,479
small and and the kind of work that

119
00:04:41,830 --> 00:04:40,000
needs to be done

120
00:04:43,909 --> 00:04:41,840
to understand the different atmospheric

121
00:04:45,030 --> 00:04:43,919
processes in the region

122
00:04:46,390 --> 00:04:45,040
is

123
00:04:48,550 --> 00:04:46,400
quite a lot

124
00:04:51,189 --> 00:04:48,560
we are so dependent on this earth

125
00:04:53,870 --> 00:04:51,199
because we live here we have to breathe

126
00:04:55,350 --> 00:04:53,880
here and find things to eat here

127
00:04:57,430 --> 00:04:55,360
[Music]

128
00:05:00,550 --> 00:04:57,440
it's important that we understand it so

129
00:05:03,430 --> 00:05:00,560
that we don't inadvertently

130
00:05:08,510 --> 00:05:03,440
cause damage that

131
00:05:13,830 --> 00:05:12,390
[Music]

132
00:05:15,670 --> 00:05:13,840
what we're seeing is that areas that

133
00:05:17,749 --> 00:05:15,680
have been flammable are becoming more

134
00:05:19,990 --> 00:05:17,759
flammable pushing those systems into

135
00:05:22,390 --> 00:05:20,000
either extreme conditions or

136
00:05:24,340 --> 00:05:22,400
a year-round fire season where fires are