1
00:00:21,470 --> 00:00:18,950
climate change is already affecting

2
00:00:23,660 --> 00:00:21,480
global food production and it will

3
00:00:27,759 --> 00:00:23,670
probably have even more of an impact in

4
00:00:34,060 --> 00:00:31,189
carbon dioxide or co2 a major greenhouse

5
00:00:36,709 --> 00:00:34,070
gas is a primary cause of global warming

6
00:00:38,900 --> 00:00:36,719
human activity provides a major source

7
00:00:41,750 --> 00:00:38,910
of co2 in our atmosphere by burning

8
00:00:43,280 --> 00:00:41,760
fossil fuels the rate of increase in

9
00:00:46,220 --> 00:00:43,290
global warming due to greenhouse gases

10
00:00:50,119 --> 00:00:46,230
is very likely unprecedented within the

11
00:00:52,430 --> 00:00:50,129
past 10,000 years or more but plants use

12
00:00:54,139 --> 00:00:52,440
carbon dioxide to grow so shouldn't

13
00:00:56,330 --> 00:00:54,149

warmer temperatures and more carbon

14
00:00:59,900 --> 00:00:56,340
dioxide be a good thing for agriculture

15
00:01:02,270 --> 00:00:59,910
if it were just the carbon dioxide going

16
00:01:04,310 --> 00:01:02,280
up in the atmosphere agriculture would

17
00:01:07,850 --> 00:01:04,320
would - all the crops would just be

18
00:01:11,750 --> 00:01:07,860
smiling and say great because the high

19
00:01:14,440 --> 00:01:11,760
co2 is good for photosynthesis so that

20
00:01:16,789 --> 00:01:14,450
in and of itself it would be good

21
00:01:20,630 --> 00:01:16,799
climate has an effect upon agriculture

22
00:01:22,429 --> 00:01:20,640
in several ways one would be in the case

23
00:01:24,859 --> 00:01:22,439
of the far north you may have a longer

24
00:01:26,330 --> 00:01:24,869
growing season so areas presently where

25
00:01:28,429 --> 00:01:26,340
you can't grow certain crops because

26
00:01:30,530 --> 00:01:28,439
it's too cold or the growing season is

27
00:01:32,840 --> 00:01:30,540
too short you might be able to grow

28
00:01:36,890 --> 00:01:32,850
these crops there as conditions warm up

29
00:01:39,350 --> 00:01:36,900
in those areas when we then add in the

30
00:01:41,149 --> 00:01:39,360
other effects of climate change let's

31
00:01:45,109 --> 00:01:41,159
first just talk about higher

32
00:01:50,270 --> 00:01:45,119
temperatures then the story becomes more

33
00:01:52,399 --> 00:01:50,280
mixed while a warmer climate might mean

34
00:01:54,530 --> 00:01:52,409
some new growing regions our major

35
00:01:59,240 --> 00:01:54,540
agricultural areas will likely face

36
00:02:04,350 --> 00:02:01,740
scientists predicted in many areas on

37
00:02:08,000 --> 00:02:04,360
earth there will be more droughts more

38
00:02:10,830 --> 00:02:08,010

fires and warmer temperatures

39
00:02:13,080 --> 00:02:10,840
while a few places may experience cooler

40
00:02:16,140 --> 00:02:13,090
temperatures more rainfall or more

41
00:02:20,100 --> 00:02:16,150
intense flooding vulnerability to

42
00:02:23,400 --> 00:02:20,110
climate is uneven across the world the

43
00:02:25,950 --> 00:02:23,410
agricultural studies show that in the

44
00:02:29,190 --> 00:02:25,960
mid and high latitudes the agriculture

45
00:02:32,820 --> 00:02:29,200
there should actually be ok for at least

46
00:02:35,970 --> 00:02:32,830
a while before the really big

47
00:02:39,570 --> 00:02:35,980
temperature changes set in but in the

48
00:02:41,580 --> 00:02:39,580
low latitudes where it's hot already and

49
00:02:44,780 --> 00:02:41,590
where there is more of their more arid

50
00:02:48,210 --> 00:02:44,790
areas that climate change will affect

51
00:02:51,960 --> 00:02:48,220
those agricultural systems negatively

52
00:02:53,910 --> 00:02:51,970
right from the beginning because the

53
00:02:56,040 --> 00:02:53,920
vast majority of developing countries

54
00:02:58,200 --> 00:02:56,050
are located near the equator these

55
00:03:01,410 --> 00:02:58,210
already vulnerable populations are right

56
00:03:03,479 --> 00:03:01,420
in the bullseye of climate change in the

57
00:03:05,760 --> 00:03:03,489
next 40 years there could be 2 billion

58
00:03:08,010 --> 00:03:05,770
more people to feed much of this

59
00:03:10,140 --> 00:03:08,020
population growth is expected to impact

60
00:03:12,870 --> 00:03:10,150
countries already facing food security

61
00:03:14,699 --> 00:03:12,880
issues so climate change threatens to

62
00:03:17,280 --> 00:03:14,709
exacerbate their risk for inhospitable

63
00:03:20,790 --> 00:03:17,290

growing conditions and lack of access to

64
00:03:23,490 --> 00:03:20,800
food our population is increasing and

65
00:03:26,820 --> 00:03:23,500
yet the land on which crops can be grown

66
00:03:30,390 --> 00:03:26,830
is not we really have plateaued in our

67
00:03:32,820 --> 00:03:30,400
ability to expand yields globally and so

68
00:03:34,590 --> 00:03:32,830
in all the places where we are have

69
00:03:37,290 --> 00:03:34,600
extremely highly productive systems

70
00:03:40,050 --> 00:03:37,300
those regions are only able to increase

71
00:03:42,300 --> 00:03:40,060
their yields by 3 or 4 percent and while

72
00:03:45,270 --> 00:03:42,310
our population is growing by 8 or 9

73
00:03:49,770 --> 00:03:47,520
climate change undoubtedly affects us

74
00:03:53,340 --> 00:03:49,780
all so our responses need to be global

75
00:03:55,710 --> 00:03:53,350
in nature NASA satellites give us a big

76
00:03:57,390 --> 00:03:55,720
picture continuous view of our changing

77
00:04:01,280 --> 00:03:57,400
climate and how it's already affecting

78
00:04:04,470 --> 00:04:01,290
us as a species by providing free

79
00:04:05,010 --> 00:04:04,480
satellite data to anyone around the

80
00:04:10,340 --> 00:04:05,020
world

81
00:04:13,070 --> 00:04:10,350
NASA is playing a tremendous role for

82
00:04:16,920 --> 00:04:13,080
understanding of agricultural production

83
00:04:18,930 --> 00:04:16,930
scientists in their own countries can be

84
00:04:21,449 --> 00:04:18,940
managing their agricultural systems as

85
00:04:22,880 --> 00:04:21,459
the climate is changing it's important

86
00:04:25,620 --> 00:04:22,890
to have these data in a continuous way

87
00:04:27,570 --> 00:04:25,630
because the more data you have then you

88
00:04:30,600 --> 00:04:27,580

know the behavior with respect to time

89
00:04:33,409 --> 00:04:30,610
so the continuity or the continuum of

90
00:04:35,820 --> 00:04:33,419
the data becomes really really important

91
00:04:38,190 --> 00:04:35,830
NASA satellites provide crucial

92
00:04:42,090 --> 00:04:38,200
observations about how our home planet

93
00:04:43,920 --> 00:04:42,100
is changing continued data from these

94
00:04:46,260 --> 00:04:43,930
satellite missions provide information