1
00:00:13,990 --> 00:00:10,870
since instrumental measurements began in

2
00:00:16,950 --> 00:00:14,000
the 1880s the past decade is officially

3
00:00:19,830 --> 00:00:16,960
the warmest on record previous research

4
00:00:21,990 --> 00:00:19,840
suggested that in the 1980s and 90s

5
00:00:23,429 --> 00:00:22,000
warmer temperatures and higher levels of

6
00:00:25,990 --> 00:00:23,439
precipitation

7
00:00:29,029 --> 00:00:26,000
factors associated with climate change

8
00:00:31,990 --> 00:00:29,039
were generally good for plant growth

9
00:00:34,630 --> 00:00:32,000
but it is possible we've had too much of

10
00:00:36,870 --> 00:00:34,640
a good thing

11
00:00:39,590 --> 00:00:36,880
an updated analysis published this week

12
00:00:41,830 --> 00:00:39,600
in the journal science indicates that as

13
00:00:43,670 --> 00:00:41,840

temperatures have continued to rise the

14
00:00:46,310 --> 00:00:43,680
benefits to plant growth are now

15
00:00:47,350 --> 00:00:46,320
overwhelmed by longer and more frequent

16
00:00:48,869 --> 00:00:47,360
droughts

17
00:00:51,910 --> 00:00:48,879
scientists from the university of

18
00:00:54,069 --> 00:00:51,920
montana investigated global net primary

19
00:00:55,750 --> 00:00:54,079
production of land plants using

20
00:00:57,029 --> 00:00:55,760
satellite data from the past three

21
00:00:59,750 --> 00:00:57,039
decades

22
00:01:01,830 --> 00:00:59,760
an instrument on nasa's terra satellite

23
00:01:04,070 --> 00:01:01,840
provides insight as to whether plants

24
00:01:05,509 --> 00:01:04,080
are actually benefiting from a changing

25
00:01:07,429 --> 00:01:05,519
climate

26
00:01:09,910 --> 00:01:07,439
high resolution data from the moderate

27
00:01:12,789 --> 00:01:09,920
resolution imaging spectral radiometer

28
00:01:15,030 --> 00:01:12,799
or modis indicate a net decrease in

29
00:01:18,230 --> 00:01:15,040
primary production from 2000 through

30
00:01:20,870 --> 00:01:18,240
2009 as compared to the previous two

31
00:01:24,950 --> 00:01:23,030
primary production is a measure of plant

32
00:01:28,070 --> 00:01:24,960
growth and the first step in the carbon

33
00:01:29,830 --> 00:01:28,080
cycle carbon enters the atmosphere from

34
00:01:32,630 --> 00:01:29,840
a variety of sources including

35
00:01:33,990 --> 00:01:32,640
deforestation fossil fuel burning and

36
00:01:36,230 --> 00:01:34,000
wildfires

37
00:01:37,830 --> 00:01:36,240
plants absorb carbon from the atmosphere

38
00:01:39,990 --> 00:01:37,840

and use it to grow

39
00:01:42,389 --> 00:01:40,000
as they continue to grow they pull down

40
00:01:44,550 --> 00:01:42,399
more carbon and slow the increasing

41
00:01:45,670 --> 00:01:44,560
concentration of carbon dioxide in the

42
00:01:47,350 --> 00:01:45,680
air

43
00:01:50,310 --> 00:01:47,360
it is important for scientists to

44
00:01:52,230 --> 00:01:50,320
monitor changes of primary production as

45
00:01:54,789 --> 00:01:52,240
changes in plant growth affect the

46
00:01:58,310 --> 00:01:54,799
balance of carbon between the atmosphere

47
00:02:00,789 --> 00:01:58,320
and terrestrial ecosystems

48
00:02:02,469 --> 00:02:00,799
this visualization represents the amount

49
00:02:04,950 --> 00:02:02,479
of carbon that was removed from the

50
00:02:07,749 --> 00:02:04,960
atmosphere by plants during the warmest

51
00:02:10,389 --> 00:02:07,759
decade on record an increase in primary

52
00:02:12,070 --> 00:02:10,399
production as indicated in green tells

53
00:02:15,030 --> 00:02:12,080
us that plants are removing carbon

54
00:02:17,030 --> 00:02:15,040
dioxide faster than they usually do

55
00:02:18,070 --> 00:02:17,040
while a decrease in primary production

56
00:02:19,910 --> 00:02:18,080
in red

57
00:02:22,710 --> 00:02:19,920
means that carbon dioxide is being

58
00:02:24,470 --> 00:02:22,720
removed more slowly

59
00:02:26,790 --> 00:02:24,480
higher temperatures led to longer

60
00:02:28,390 --> 00:02:26,800
growing seasons and increased amounts of

61
00:02:30,869 --> 00:02:28,400
water and sunlight in the northern

62
00:02:33,589 --> 00:02:30,879
hemisphere causing a net increase in

63
00:02:35,990 --> 00:02:33,599

atmospheric primary production but it

64
00:02:37,430 --> 00:02:36,000
was not enough to offset the decrease in

65
00:02:39,589 --> 00:02:37,440
carbon absorption in the southern

66
00:02:41,910 --> 00:02:39,599
hemisphere leading to more carbon

67
00:02:44,309 --> 00:02:41,920
dioxide in the atmosphere

68
00:02:47,509 --> 00:02:44,319
africa for instance suffered a severe

69
00:02:49,750 --> 00:02:47,519
drought in 2005. crops suffered major

70
00:02:51,830 --> 00:02:49,760
losses and with less green vegetation to

71
00:02:53,670 --> 00:02:51,840
fix the carbon there was more of it left

72
00:02:56,070 --> 00:02:53,680
in the atmosphere

73
00:02:58,309 --> 00:02:56,080
the planet as a whole experienced a net

74
00:03:01,110 --> 00:02:58,319
decrease in primary production over the

75
00:03:02,630 --> 00:03:01,120
past 10 years but it was a modest

76
00:03:05,030 --> 00:03:02,640
decrease

77
00:03:07,910 --> 00:03:05,040
this research reinforces the idea that

78
00:03:09,750 --> 00:03:07,920
climate variability is complex with

79
00:03:12,550 --> 00:03:09,760
increasing demands on our natural

80
00:03:15,350 --> 00:03:12,560
resources a growing population and

81
00:03:17,670 --> 00:03:15,360
expansion of biofuel production it is

82
00:03:20,149 --> 00:03:17,680
critical to monitor the large-scale