1
00:00:16,359 --> 00:00:13,370
every year farms and fields play host to

2
00:00:19,490 --> 00:00:16,369
a symphony of sorts

3
00:00:22,070 --> 00:00:19,500
pollination the springtime syncopation

4
00:00:23,720 --> 00:00:22,080
of flowering plants and the animals who

5
00:00:28,920 --> 00:00:23,730
feast on the nectar and pollen they

6
00:00:33,840 --> 00:00:31,380
over millennia pollinators like

7
00:00:39,420 --> 00:00:33,850
honeybees have evolved a well time dance

8
00:00:46,110 --> 00:00:39,430
with plants but now plants may be

9
00:00:48,000 --> 00:00:46,120
changing their tune spring Greenup when

10
00:00:50,759 --> 00:00:48,010
plants wake from winter and sprout

11
00:00:52,740 --> 00:00:50,769
leaves it's such a global phenomenon

12
00:01:06,840 --> 00:00:52,750
that nasa satellites can see it from

13
00:01:09,359 --> 00:01:06,850

space sensors such as modis on NASA's

14
00:01:10,950 --> 00:01:09,369
Aqua and Terra satellites can show us

15
00:01:13,080 --> 00:01:10,960
how green our planet is throughout the

16
00:01:16,620 --> 00:01:13,090
year and they've captured something

17
00:01:18,480 --> 00:01:16,630
strange in the northern US a spring

18
00:01:21,960 --> 00:01:18,490
Greenup is starting about a half day

19
00:01:26,310 --> 00:01:21,970
earlier each year the likely cause our

20
00:01:28,590 --> 00:01:26,320
warming climate but is pollination also

21
00:01:31,289 --> 00:01:28,600
moving earlier the images can't detect

22
00:01:36,930 --> 00:01:31,299
individual flowers so scientists have

23
00:01:42,340 --> 00:01:39,910
NASA research scientist Wayne is a Asst

24
00:01:44,590 --> 00:01:42,350
spearheads a special team gathering data

25
00:01:47,640 --> 00:01:44,600
directly in the field they're the

26
00:01:50,560 --> 00:01:47,650
honeybees in his Maryland backyard

27
00:01:52,950 --> 00:01:50,570
honeybees are great David collectors for

28
00:01:56,560 --> 00:01:52,960
understanding processes of pollination

29
00:01:57,340 --> 00:01:56,570
bees fly two and a half miles in all

30
00:02:00,400 --> 00:01:57,350
directions

31
00:02:02,800 --> 00:02:00,410
to scout for 4 D forage and bring back

32
00:02:05,260 --> 00:02:02,810
pollen and nectar and so therefore they

33
00:02:09,130 --> 00:02:05,270
sample a very large range of

34
00:02:11,080 --> 00:02:09,140
environments by weighing the hives Wayne

35
00:02:15,190 --> 00:02:11,090
can detect when nectar peaks and ebbs

36
00:02:17,680 --> 00:02:15,200
each year during the winter the hive

37
00:02:20,199 --> 00:02:17,690
loses weight as they eat the honey to

38
00:02:22,540 --> 00:02:20,209

feed their babies and keep warm and then

39
00:02:25,690 --> 00:02:22,550
when plants start blooming in abundance

40
00:02:27,730 --> 00:02:25,700
the hive starts gaining weight it can

41
00:02:33,990 --> 00:02:27,740
gain a tremendous amount of weight I've

42
00:02:39,000 --> 00:02:36,400
Wayne's been keeping tabs on his bees

43
00:02:41,290 --> 00:02:39,010
for less than 20 years but in that time

44
00:02:45,220 --> 00:02:41,300
pollination has moved more than 10 days

45
00:02:47,830 --> 00:02:45,230
earlier that's completely in sync with

46
00:02:51,460 --> 00:02:47,840
what the satellite data record shows the

47
00:02:58,620 --> 00:02:51,470
world here hitting greener earlier in

48
00:03:04,120 --> 00:03:01,750
if we have a few scale hive measurements

49
00:03:06,490 --> 00:03:04,130
with the wall-to-wall coverage of the

50
00:03:08,110 --> 00:03:06,500
satellite we can then extrapolate those

51
00:03:10,570 --> 00:03:08,120
scale hive measurements of when the

52
00:03:17,170 --> 00:03:10,580
nectar flows occur to very large areas

53
00:03:19,030 --> 00:03:17,180
of the country now to get a bees eye

54
00:03:20,890 --> 00:03:19,040
perspective of how pollination is

55
00:03:24,670 --> 00:03:20,900
changing in very different environments

56
00:03:29,350 --> 00:03:24,680
say deserts or mountains Wayne's doing a

57
00:03:32,430 --> 00:03:29,360
little networking honeybee net is a

58
00:03:36,340 --> 00:03:32,440
network of citizen scientists beekeepers

59
00:03:39,880 --> 00:03:36,350
that volunteered to weigh their hives to

60
00:03:41,770 --> 00:03:39,890
give us more data points to see how the

61
00:03:43,289 --> 00:03:41,780
nectar flows are changing in all

62
00:03:46,000 --> 00:03:43,299
different parts of the country

63
00:03:48,490 --> 00:03:46,010

if pollination dates keep creeping

64
00:03:53,070 --> 00:03:48,500
forward plants and pollinators could

65
00:03:57,640 --> 00:03:55,930
currently young bees are able to grow

66
00:04:01,660 --> 00:03:57,650
and get out on the hunt by the time

67
00:04:07,089 --> 00:04:03,850
but if plants bloom before bees are

68
00:04:11,500 --> 00:04:07,099
ready both miss out the plants don't get

69
00:04:15,659 --> 00:04:11,510
pollinated and the bees go hungry but

70
00:04:20,140 --> 00:04:18,400
NASA satellites can help us understand

71
00:04:22,800 --> 00:04:20,150
how climate change might affect what's

72
00:04:27,430 --> 00:04:22,810
on our dinner table

73
00:04:30,909 --> 00:04:27,440
modern agriculture requires bees as part

74
00:04:33,520 --> 00:04:30,919
of the production it's as mandatory for

75
00:04:37,420 --> 00:04:33,530
food production as is pieces of

76
00:04:39,129 --> 00:04:37,430
irrigation pipe and fuel for tractors so

77
00:04:41,770 --> 00:04:39,139
if we're to understand the impact of

78
00:04:44,800 --> 00:04:41,780
climate change on our ecosystems we must

79
00:04:47,770 --> 00:04:44,810
understand how this plant pollinator