1
00:00:17,480 --> 00:00:15,320
imagine what the East Coast of the

2
00:00:19,970 --> 00:00:17,490
United States looked like before the

3
00:00:22,670 --> 00:00:19,980
cities were built before the sprawl of

4
00:00:26,179 --> 00:00:22,680
the suburbs and before farmland dotted

5
00:00:27,980 --> 00:00:26,189
the countryside old-growth forests made

6
00:00:31,400 --> 00:00:27,990
up much of the landscape along the east

7
00:00:33,200 --> 00:00:31,410
coast as people began developing the

8
00:00:36,319 --> 00:00:33,210
land they cleared the forests for

9
00:00:38,150 --> 00:00:36,329
fertile planting soil and pasture this

10
00:00:40,190 --> 00:00:38,160
alteration of the landscape is called

11
00:00:46,160 --> 00:00:40,200
land-use change and it's still happening

12
00:00:48,229 --> 00:00:46,170
all over the globe University of

13
00:00:50,240 --> 00:00:48,239

Maryland professor Chris Justus spends

14
00:00:52,310 --> 00:00:50,250
his time studying land-use change

15
00:00:54,380 --> 00:00:52,320
through a nasa-funded satellite remote

16
00:00:57,229 --> 00:00:54,390
sensing project called the land cover

17
00:00:59,959 --> 00:00:57,239
land-use change program as we as we're

18
00:01:02,090 --> 00:00:59,969
looking from space over time we're able

19
00:01:05,020 --> 00:01:02,100
to see these changes and some of them

20
00:01:07,460 --> 00:01:05,030
are very abrupt and quite astounding

21
00:01:09,679 --> 00:01:07,470
Chris and his team monitor the Earth's

22
00:01:11,810 --> 00:01:09,689
surface to get an idea of where his land

23
00:01:15,140 --> 00:01:11,820
cover is changing and what the land is

24
00:01:17,840 --> 00:01:15,150
being used for what we see from space is

25
00:01:24,730 --> 00:01:17,850
the surface of the earth and land cover

26
00:01:28,130 --> 00:01:24,740
could be Forest or grassland woodland

27
00:01:29,660 --> 00:01:28,140
urban areas whereas land use is what

28
00:01:31,789 --> 00:01:29,670
people are doing with that surface the

29
00:01:33,980 --> 00:01:31,799
land cover land-use change projects

30
00:01:36,230 --> 00:01:33,990
specifically looks at agricultural land

31
00:01:37,819 --> 00:01:36,240
use change understanding where people

32
00:01:40,310 --> 00:01:37,829
are altering the land surface for

33
00:01:42,289 --> 00:01:40,320
growing food allows governments and NGOs

34
00:01:45,230 --> 00:01:42,299
to see which land is being converted

35
00:01:48,109 --> 00:01:45,240
from one type of use to another not only

36
00:01:49,429 --> 00:01:48,119
do we have an expansion of Agriculture

37
00:01:52,179 --> 00:01:49,439
in some parts of the world but in others

38
00:01:55,490 --> 00:01:52,189

we have an abandon of Agriculture and

39
00:01:58,459 --> 00:01:55,500
this in turn has implications in terms

40
00:02:00,499 --> 00:01:58,469
of both carbon sequestration but it also

41
00:02:03,139 --> 00:02:00,509
has impacts in terms of fire

42
00:02:04,999 --> 00:02:03,149
distribution whereas agricultural

43
00:02:07,459 --> 00:02:05,009
practices would clear and manage the

44
00:02:09,410 --> 00:02:07,469
fuel on active farmland on abandoned

45
00:02:11,449 --> 00:02:09,420
land that fuel is much less managed

46
00:02:13,490 --> 00:02:11,459
leading to some of the disastrous fires

47
00:02:16,089 --> 00:02:13,500
we have seen in recent years all over

48
00:02:22,699 --> 00:02:18,680
urban development is not the only cause

49
00:02:24,470 --> 00:02:22,709
for land-use change the Brazilian

50
00:02:26,869 --> 00:02:24,480
rainforest is being cleared at an

51
00:02:28,790 --> 00:02:26,879
alarming rate as subsistence farmers

52
00:02:31,670 --> 00:02:28,800
convert the land for pasture and crops

53
00:02:35,180 --> 00:02:31,680
like sugarcane and soy subsistence

54
00:02:37,420 --> 00:02:35,190
farmers are coming in that after a few

55
00:02:41,270 --> 00:02:37,430
years due to infertile soils

56
00:02:43,460 --> 00:02:41,280
those lands will be abandoned new areas

57
00:02:45,380 --> 00:02:43,470
will be cut down for agriculture and

58
00:02:48,309 --> 00:02:45,390
those those lands can either revert to

59
00:02:50,660 --> 00:02:48,319
forests or they can be used for pasture

60
00:02:52,360 --> 00:02:50,670
clearing the tropical rainforest has

61
00:02:55,039 --> 00:02:52,370
many negative effects on biodiversity

62
00:02:56,870 --> 00:02:55,049
just as other land-use practices like

63
00:02:59,119 --> 00:02:56,880

the application of harmful pesticides

64
00:03:02,300 --> 00:02:59,129
and fertilizers can have similar side

65
00:03:04,970 --> 00:03:02,310
effects from the US we've seen

66
00:03:09,589 --> 00:03:04,980
increasing dead zone at the mouth of the

67
00:03:12,350 --> 00:03:09,599
Mississippi where you have conditions

68
00:03:14,150 --> 00:03:12,360
where fish can't live due to the excess

69
00:03:16,850 --> 00:03:14,160
fertilizer that is being put in upstream

70
00:03:18,650 --> 00:03:16,860
from agricultural production the

71
00:03:21,170 --> 00:03:18,660
physical dimensions of land-use change

72
00:03:24,259 --> 00:03:21,180
are only part of the story understanding

73
00:03:26,390 --> 00:03:24,269
the cultural economic and social facets

74
00:03:28,550 --> 00:03:26,400
of land-use change is important because

75
00:03:30,920 --> 00:03:28,560
all of these aspects are interconnected

76
00:03:32,120 --> 00:03:30,930
it takes social scientists and physical

77
00:03:34,990 --> 00:03:32,130
scientists working together in an

78
00:03:39,890 --> 00:03:35,000
integrated way to really understand the

79
00:03:42,830 --> 00:03:39,900
not just the the causes of of land-use

80
00:03:44,350 --> 00:03:42,840
change but the impacts and consequences

81
00:03:46,690 --> 00:03:44,360
our language

82
00:03:49,720 --> 00:03:46,700
as we face climate change in global

83
00:03:51,430 --> 00:03:49,730
population growth NASA data continue to

84
00:03:53,010 --> 00:03:51,440
provide scientists with the tools they

85
00:03:56,530 --> 00:03:53,020
need to monitor the world's agricultural

86
00:03:59,380 --> 00:03:56,540
regions when the the information that we

87
00:04:01,120 --> 00:03:59,390
provide by the satellite is used to make

88
00:04:03,070 --> 00:04:01,130

management decisions that actually