1
00:00:17,570 --> 00:00:14,810
beautiful it's a perspective that's

2
00:00:21,200 --> 00:00:17,580
thrilled astronauts escape everyone else

3
00:00:23,179 --> 00:00:21,210
peaceful and for over 25 years crunches

4
00:00:25,730 --> 00:00:23,189
look back and wonder from this unique

5
00:00:28,519 --> 00:00:25,740
vantage point generating a variety of

6
00:00:31,099 --> 00:00:28,529
earth imagery produced with motion

7
00:00:33,590 --> 00:00:31,109
picture and still cameras as well as the

8
00:00:36,080 --> 00:00:33,600
shuttles onboard video system these

9
00:00:39,080 --> 00:00:36,090
images provide a visual record of how

10
00:00:40,880 --> 00:00:39,090
our planet is changing over time and

11
00:00:43,400 --> 00:00:40,890
along with satellite data offer

12
00:00:45,580 --> 00:00:43,410
scientists in a number of disciplines is

13
00:00:47,869 --> 00:00:45,590

when you hook and research tool

14
00:00:50,380 --> 00:00:47,879
oceanographers can look at currents from

15
00:00:53,150 --> 00:00:50,390
the right position with respect to Sun a

16
00:00:56,150 --> 00:00:53,160
detailed cloud patterns are captured for

17
00:00:58,760 --> 00:00:56,160
meteorologists and geologists can see

18
00:01:02,090 --> 00:00:58,770
large areas with very high photographic

19
00:01:04,990 --> 00:01:02,100
resolution this is a almost vertical

20
00:01:08,929 --> 00:01:05,000
shot of San Francisco as we look down

21
00:01:11,420 --> 00:01:08,939
you can very easily see the fault line

22
00:01:14,270 --> 00:01:11,430
so from a geological standpoint this is

23
00:01:16,760 --> 00:01:14,280
a very very good photograph the Sun

24
00:01:18,800 --> 00:01:16,770
angle is fairly low and you can see

25
00:01:23,359 --> 00:01:18,810
exactly where the major minor faults are

26
00:01:25,609 --> 00:01:23,369
in the San Francisco area astronauts

27
00:01:28,219 --> 00:01:25,619
begin training in earth observations

28
00:01:29,960 --> 00:01:28,229
when they entered the space program so

29
00:01:32,030 --> 00:01:29,970
that by the time they fly they are

30
00:01:34,039 --> 00:01:32,040
thoroughly familiar with the science and

31
00:01:36,289 --> 00:01:34,049
photographic techniques involved in the

32
00:01:38,929 --> 00:01:36,299
effort this enables them to make

33
00:01:41,810 --> 00:01:38,939
real-time decisions about things from

34
00:01:43,999 --> 00:01:41,820
orbit including the shattering phenomena

35
00:01:46,550 --> 00:01:44,009
the original flight plan all those

36
00:01:48,889 --> 00:01:46,560
events that there cannot be predicted

37
00:01:53,840 --> 00:01:48,899
engines they just happen it is nice to

38
00:01:56,209 --> 00:01:53,850

have a crew set of humanized 22 direct

39
00:01:58,999 --> 00:01:56,219
cameras and instrumentation to those

40
00:02:00,700 --> 00:01:59,009
sites in a very rapid response and

41
00:02:03,410 --> 00:02:00,710
that's the value of the human being

42
00:02:05,630 --> 00:02:03,420
earth observations from the shuttle

43
00:02:06,800 --> 00:02:05,640
revealed dramatic changes on the face of

44
00:02:09,290 --> 00:02:06,810
our planet

45
00:02:11,990 --> 00:02:09,300
this is a view of Lake Chad and

46
00:02:15,979 --> 00:02:12,000
Mauritania seen over the nose of a

47
00:02:17,690 --> 00:02:15,989
Gemini spacecraft back in 1966 shuttle

48
00:02:19,850 --> 00:02:17,700
crews flying over central Africa in the

49
00:02:21,800 --> 00:02:19,860
nineteen eighty-five timeframe saw like

50
00:02:23,600 --> 00:02:21,810
Chad looking like this the only

51
00:02:25,400 --> 00:02:23,610
remaining water in the lake is that

52
00:02:28,190 --> 00:02:25,410
light gray patch at the upper end of the

53
00:02:30,250 --> 00:02:28,200
dark zone the SU courses simultaneous

54
00:02:33,410 --> 00:02:30,260
with the extensive drought conditions in

55
00:02:35,360 --> 00:02:33,420
central Africa that underlies those very

56
00:02:38,570 --> 00:02:35,370
pointed human stories that we read about

57
00:02:40,910 --> 00:02:38,580
the fragility of our atmosphere has

58
00:02:44,270 --> 00:02:40,920
struck all earth-observing astronauts

59
00:02:46,160 --> 00:02:44,280
you see how very very thin a little

60
00:02:48,259 --> 00:02:46,170
coating it is compared to the rest of

61
00:02:50,870 --> 00:02:48,269
the signs of the planet it's not like

62
00:02:53,420 --> 00:02:50,880
the peel on a grapefruit or the peel on

63
00:02:56,479 --> 00:02:53,430

an orange it's not even really like to

64
00:02:59,390 --> 00:02:56,489
me the shell on an egg for relative

65
00:03:00,800 --> 00:02:59,400
sizes if anything it's almost as if

66
00:03:03,350 --> 00:03:00,810
we're covered by that thin little

67
00:03:05,059 --> 00:03:03,360
membrane between the egg shell and the

68
00:03:08,509 --> 00:03:05,069
egg itself that's the tiny little

69
00:03:11,300 --> 00:03:08,519
membrane of air and gases that keeps us

70
00:03:14,300 --> 00:03:11,310
all healthy a major environmental

71
00:03:16,550 --> 00:03:14,310
concern today is the large field burning

72
00:03:19,099 --> 00:03:16,560
and subsequent deforestation going on

73
00:03:21,550 --> 00:03:19,109
around the world a number of shuttle

74
00:03:24,349 --> 00:03:21,560
crews have documented this activity

75
00:03:27,680 --> 00:03:24,359
intent is to recognize that there really

76
00:03:30,830 --> 00:03:27,690
are no sovereign boundaries in our

77
00:03:33,289 --> 00:03:30,840
environment but that everyone mankind as