1
00:00:26,480 --> 00:00:24,019
clouds have forever held the imagination

2
00:00:28,460 --> 00:00:26,490
of sky gazers who are captivated by

3
00:00:31,640 --> 00:00:28,470
their endless beauty and seeming

4
00:00:35,240 --> 00:00:31,650
randomness but clouds and what's in them

5
00:00:37,130 --> 00:00:35,250
also hold fascination for scientists who

6
00:00:39,709 --> 00:00:37,140
seek to understand that many effects

7
00:00:42,650 --> 00:00:39,719
they have on life here on earth low

8
00:00:45,319 --> 00:00:42,660
clouds which our white can can reflect

9
00:00:48,799 --> 00:00:45,329
sunlight and cause cooling of the earth

10
00:00:52,250 --> 00:00:48,809
and high clouds tend to warm the earth

11
00:00:56,599 --> 00:00:52,260
by absorbing and re radiating warmth

12
00:00:59,290 --> 00:00:56,609
back into the atmosphere to one we have

13
00:01:02,329 --> 00:00:59,300

ignition and we have liftoff of NASA's

14
00:01:06,080 --> 00:01:02,339
Calypso cloud set spacecraft since its

15
00:01:08,530 --> 00:01:06,090
launch in April 2006 the cloud-aerosol

16
00:01:11,840 --> 00:01:08,540
lidar and infrared pathfinder satellite

17
00:01:14,420 --> 00:01:11,850
observation mission Calypso has provided

18
00:01:17,110 --> 00:01:14,430
new insight into the role that clouds

19
00:01:20,000 --> 00:01:17,120
play in regulating our climate as

20
00:01:23,030 --> 00:01:20,010
Calypso orbits the earth its light

21
00:01:26,510 --> 00:01:23,040
detection and ranging or lidar system

22
00:01:29,840 --> 00:01:26,520
emits short pulses of green and infrared

23
00:01:32,720 --> 00:01:29,850
light producing a 300 foot wide snapshot

24
00:01:36,310 --> 00:01:32,730
of what's in the atmosphere from top to

25
00:01:39,170 --> 00:01:36,320
bottom clouds and airborne particles

26
00:01:41,720 --> 00:01:39,180
snapshots collected along the same orbit

27
00:01:43,940 --> 00:01:41,730
are then streamed together to paint a

28
00:01:46,220 --> 00:01:43,950
picture of what a vertical slice of our

29
00:01:49,730 --> 00:01:46,230
atmosphere looks like it's basically a

30
00:01:51,290 --> 00:01:49,740
large laser rangefinder and it shoots

31
00:01:54,950 --> 00:01:51,300
light down in the atmosphere and it's

32
00:01:57,410 --> 00:01:54,960
able to detect and measure clouds in the

33
00:02:00,650 --> 00:01:57,420
vertical not like a photograph which is

34
00:02:04,430 --> 00:02:00,660
tends to be 2-dimensional but gives us

35
00:02:07,640 --> 00:02:04,440
vertical curtains of Clow measurements

36
00:02:10,249 --> 00:02:07,650
of clouds ie their altitude these

37
00:02:12,410 --> 00:02:10,259
critical cloud data from Calypso are

38
00:02:14,330 --> 00:02:12,420

used with information gathered by other

39
00:02:15,920 --> 00:02:14,340
satellites in NASA's a-train

40
00:02:17,180 --> 00:02:15,930
constellation of earth-observing

41
00:02:19,370 --> 00:02:17,190
spacecraft

42
00:02:22,130 --> 00:02:19,380
to quantify just how much sunlight

43
00:02:25,160 --> 00:02:22,140
reaches the planet and how much gets

44
00:02:28,940 --> 00:02:25,170
radiated back into space this so-called

45
00:02:31,580 --> 00:02:28,950
energy budget is a key to documenting an

46
00:02:35,120 --> 00:02:31,590
understanding climate change we have

47
00:02:37,010 --> 00:02:35,130
found it appears as though the the earth

48
00:02:38,930 --> 00:02:37,020
is warming and their warmth and it's

49
00:02:41,000 --> 00:02:38,940
warming because of an imbalance or a

50
00:02:43,850 --> 00:02:41,010
change in the Earth's energy budget to

51
00:02:47,450 --> 00:02:43,860
see and learn more about Calypso's cloud

52
00:02:50,000 --> 00:02:47,460
images or how calypso is also helping

53
00:02:52,250 --> 00:02:50,010
scientists understand how climate may be

54
00:02:54,020 --> 00:02:52,260
changed by naturally occurring and

55
00:02:57,490 --> 00:02:54,030
man-made particulates in the atmosphere

56
00:03:02,660 --> 00:02:57,500
called aerosols go to