10 YEARS OF AURA LEGACY

1
00:00:08,160 --> 00:00:04,150
[dramatic music]

2
00:00:08,180 --> 00:00:12,340
ago, on July 15th, 2004, NASA launched a

3
00:00:12,360 --> 00:00:16,350
new science satellite: Aura. The third in

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00:00:16,370 --> 00:00:20,360
NASA's Earth-observing system of satellites, Aura was designed to monitor the

5
00:00:20,380 --> 00:00:24,380
composition of the Earth's atmosphere and record our planet's health.

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00:00:24,400 --> 00:00:28,420
Aura measures the crucial gases that affect our protective ozone layer,

7
00:00:28,440 --> 00:00:32,440
the quality of the air we breathe, and our changing climate.

8
00:00:32,460 --> 00:00:36,480
[music transitions]

9
00:00:36,500 --> 00:00:40,680
The region of our upper atmosphere known as the ozone layer

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00:00:40,700 --> 00:00:44,690
protects everyone living on Earth's surface. >>Paul: Ozone

11
00:00:44,710 --> 00:00:48,760
screens ultraviolet radiation. If there's less ozone, you

12
00:00:48,780 --> 00:00:52,770
sunburn faster. This UV radiation can also cause things like

13
00:00:52,790 --> 00:00:56,780

skin cancer. It can result in the suppression of your immune system.

14
00:00:56,800 --> 00:01:00,830
>>Narrator: A few decades ago, man-made chemical substances known as

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00:01:00,850 --> 00:01:04,840
CFCs were destroying our ozone layer. >>Paul: Ozone-depleting

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00:01:04,860 --> 00:01:08,850
substances were going up and up and up during the 1970s.

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00:01:08,870 --> 00:01:12,880
In 1987, the Montreal Protocol was signed, and that slowed

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00:01:12,900 --> 00:01:16,910
the growth rate. And in fact now, every nation on the Earth has signed the

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00:01:16,930 --> 00:01:21,100
Montreal Protocol, and these ozone-depleting substances are fully banned.

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00:01:21,120 --> 00:01:25,110
So we needed a satellite to go up that could watch the ozone

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00:01:25,130 --> 00:01:29,150
layer and see how these man-made chemicals were impacting ozone. So this is

22
00:01:29,170 --> 00:01:33,170
really a key period - is ozone starting to recover from the

23
00:01:33,190 --> 00:01:37,220
effects of these ozone-depleting substances? Ozone was going down,

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00:01:37,240 --> 00:01:41,230
and now it's kind of gone flat. And Aura's been flying during this period,

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00:01:41,250 --> 00:01:45,430
telling us exactly what's happening to ozone. And we're hoping that in

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00:01:45,450 --> 00:01:49,440
the next decade or so, we're going to see ozone start going up.

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00:01:49,460 --> 00:01:53,460
>>Narrator: Aura also measures the pollutant gases

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00:01:53,480 --> 00:01:57,490
in our lower atmosphere, near the surface. >>Bryan: We've seen

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00:01:57,510 --> 00:02:01,590
dramatic changes in the US air pollution during the Aura record since 2004.

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00:02:01,610 --> 00:02:05,620
Our air quality is improving. It's a lot better than it was

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00:02:05,640 --> 00:02:09,650
a decade ago, and that has been the result of environmental regulations.

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00:02:09,670 --> 00:02:13,660
They're working. >>Narrator: Even though air quality has been improving in the US,

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00:02:13,680 --> 00:02:17,710
other places in the world have seen their air quality get worse.

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00:02:17,730 --> 00:02:21,720
>>Bryan: In countries like China and India, and many other countries in the

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00:02:21,740 --> 00:02:25,720
Middle-East or Africa, we're seeing pollutant emissions go up. And so satellites

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00:02:25,740 --> 00:02:29,830
are able to see their pollutant levels and monitor them over time.

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00:02:29,850 --> 00:02:33,840
[music transitions]

38
00:02:33,860 --> 00:02:38,020

>>Narrator: Aura also measures aerosols, and gases

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00:02:38,040 --> 00:02:42,030
such as carbon dioxide, methane, and water vapor, so that scientists

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00:02:42,050 --> 00:02:46,060
can study how they interact with clouds and each other, affecting our climate.

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00:02:46,080 --> 00:02:50,120
>>Bryan: If you want to understand climate change, you need to monitor the greenhouse gases and how

42
00:02:50,140 --> 00:02:54,130
they change over time. >>Narrator: Climate change takes decades,

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00:02:54,150 --> 00:02:58,150
and it certainly takes more than ten years to study and understand it.

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00:02:58,170 --> 00:03:02,160
Aura's record of greenhouse gases and aerosols adds to the satellite

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00:03:02,180 --> 00:03:06,210
and ground data that we've accumulated over the past several decades.

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00:03:06,230 --> 00:03:10,260
Along with measurements of things like clouds and rainfall from other satellites,

47
00:03:10,280 --> 00:03:14,270
Aura composition data reveal the processes that contribute to

48
00:03:14,290 --> 00:03:18,300
climate change. [music transitions]

49
00:03:18,320 --> 00:03:22,310
>>Paul: Aura has four instruments. The first one is

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00:03:22,330 --> 00:03:26,330
the Ozone Monitoring Instrument. The second one is TES.

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00:03:26,350 --> 00:03:30,400
It measures in the infrared, and it measures things like

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00:03:30,420 --> 00:03:34,430
carbon monoxide. The third instrument is the Microwave Limb Sounder. MLS measures

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00:03:34,450 --> 00:03:38,430
a range of gases - chlorine monoxide, also measures ozone.

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00:03:38,450 --> 00:03:42,520
And the fourth instrument is HRDLS. It didn't last very long,

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00:03:42,540 --> 00:03:46,560
but HRDLS could measure, again, ozone, it could measure

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00:03:46,580 --> 00:03:50,570
some of the chlorofluorocarbons. Some of these instruments had evolved

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00:03:50,590 --> 00:03:54,760
from earlier instruments. But Aura brought new technology

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00:03:54,780 --> 00:03:58,760
and better resolution.

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00:03:58,780 --> 00:04:02,970
[music transitions]

60
00:04:02,990 --> 00:04:07,150
>>Narrator: Over these past ten years, Aura has been here to witness and record this

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00:04:07,170 --> 00:04:11,220
momentous time in our environmental history. Aura sees the effects of

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00:04:11,240 --> 00:04:15,220
emission regulations on our ozone layer and our air quality, and monitors the

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00:04:15,240 --> 00:04:19,330

greenhouse gases that contribute to our changing climate.

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00:04:19,350 --> 00:04:23,390
The Aura mission was designed to last five years.

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00:04:23,410 --> 00:04:27,570
We are now celebrating the mission's ten-year anniversary, and its instruments

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00:04:27,590 --> 00:04:31,620
are still producing excellent science data. Based on the amount

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00:04:31,640 --> 00:04:35,640
of fuel left in the spacecraft and the condition of the instruments, engineers

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00:04:35,660 --> 00:04:39,640
project that Aura will continue delivering crucial science data until

69
00:04:39,660 --> 00:04:43,820
2022 and beyond.

70
00:04:43,840 --> 00:04:47,850
[final drumbeat reverberates] [beep beep... beep beep...]