1
00:00:00,000 --> 00:00:07,520
[Music]

2
00:00:07,520 --> 00:00:11,040
Ott: I think one of the things that's really
special about this visualization is that

3
00:00:11,040 --> 00:00:14,840
it's showing this new and really
complex part of our model, which is

4
00:00:14,840 --> 00:00:17,240
atmospheric chemistry.

5
00:00:17,360 --> 00:00:20,910
Keller: One of the issues, I think
with atmospheric chemistry, is that it's

6
00:00:20,910 --> 00:00:27,520
so complicated, and it changes so rapidly
on a short scale, we're not necessarily

7
00:00:27,600 --> 00:00:31,840
able to observe it all the time, everywhere.

8
00:00:33,640 --> 00:00:35,720
Ott: So that's where models come in.

9
00:00:35,720 --> 00:00:39,180
By merging models and satellite data,
we get a much fuller picture of what's

10
00:00:39,180 --> 00:00:41,040
going on throughout the atmosphere.

11
00:00:41,040 --> 00:00:42,899
We can see gases that we couldn't see with

12

00:00:42,899 --> 00:00:44,120
satellites alone.

13
00:00:44,120 --> 00:00:46,350
We can see the parts of the atmospheric column that we really

14
00:00:46,350 --> 00:00:50,010
need to know, like the nose-level
contributions of pollutants that we need

15
00:00:50,010 --> 00:00:53,520
to communicate to policymakers to
protect people's health.

16
00:00:55,800 --> 00:00:57,220
Keller: So what we are

17
00:00:57,220 --> 00:01:02,420
seeing is a visualization of the
composition of the atmosphere as it

18
00:01:02,430 --> 00:01:04,520
relates to air pollution.

19
00:01:04,520 --> 00:01:06,570
There are hundreds of chemicals that all

20
00:01:06,570 --> 00:01:13,350
contribute to those pollutants, and you
can see in this visualization, is really

21
00:01:13,350 --> 00:01:16,360
what the computer model does sort of like underneath.

22
00:01:16,360 --> 00:01:17,250
There are hundreds of

23
00:01:17,250 --> 00:01:20,180
chemicals, they all react with each other.

24
00:01:20,180 --> 00:01:22,830
It's a huge dating pool and all of the

25
00:01:22,830 --> 00:01:26,720
chemicals date each other all the time.

26
00:01:27,540 --> 00:01:30,980
Ott: So even though these chemicals, some of
them are present only at these very

27
00:01:30,990 --> 00:01:34,829
dilute concentrations, they're actually
quite important. So we have to really

28
00:01:34,829 --> 00:01:38,159
track all of these different molecules
to be able to get at those pieces that

29
00:01:38,160 --> 00:01:42,680
people really need - the pieces of
information that affect human health.

30
00:01:42,680 --> 00:01:47,920
Keller: We rely on computer models to gain
additional insights on where is it formed,

31
00:01:47,939 --> 00:01:53,040
where is it destroyed, what are the
mechanism in how it is formed, but also

32
00:01:53,040 --> 00:01:55,400
how can it be mitigated?

33
00:01:55,400 --> 00:01:57,570
Ott: There's all this interesting stuff going on all

34
00:01:57,570 --> 00:02:02,250
around us that were not necessarily

aware of, and so this simulation is

35
00:02:02,250 --> 00:02:06,479
really just trying to illustrate what's
going on with those gases, but by showing

36
00:02:06,479 --> 00:02:10,259
so many of them illustrate how complex
their interactions are and how many

37
00:02:10,280 --> 00:02:14,760
things are going on even if we're
not aware of them all the time.

38
00:02:14,760 --> 00:03:36,520
[Music]

39
00:03:36,520 --> 00:03:40,240
Ott: Ten years ago, we couldn't do anything
like this. So this is really a

40
00:03:40,240 --> 00:03:45,120
revolutionary type of approach to be
able to combine the satellite and the

41
00:03:45,140 --> 00:03:50,150
model, and the thing that impresses me
the most about visualizations like this

42
00:03:50,160 --> 00:03:52,600
is just that we can do it.

43
00:03:52,600 --> 00:03:54,600
Just that with all of this complexity, all of these

44
00:03:54,620 --> 00:03:58,400
kinds of things being transported the
atmosphere, that this actually works and

45

00:03:58,400 --> 00:04:02,450
when we compare it against observations,
it actually looks really really good in

46
00:04:02,450 --> 00:04:03,754
a lot of places.