

Mar 29 2020  
Ozone Anomaly



NOAA/CIRES - 1/1/1997-1/1/2020 (DAILY TO 2020)



1  
00:00:00,767 --> 00:00:05,538  
Recently, two separate NASA studies  
illustrated the complex relationship

2  
00:00:05,538 --> 00:00:08,108  
between human activity and our atmosphere.

3  
00:00:09,542 --> 00:00:13,646  
First up, a team led by scientists  
at NASA's Jet Propulsion Laboratory

4  
00:00:13,646 --> 00:00:18,451  
focused on drops in nitrogen oxide  
emissions during the COVID 19 lockdowns.

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00:00:20,020 --> 00:00:24,190  
Nitrogen oxide comes from sources  
like power plants and car exhaust

6  
00:00:24,557 --> 00:00:28,361  
and reacts to form surface level ozone,  
which is harmful to human health.

7  
00:00:30,163 --> 00:00:31,631  
Using NASA satellites,

8  
00:00:31,631 --> 00:00:35,769  
the team saw that the lockdowns left  
a distinct 'fingerprint' on ozone levels

9  
00:00:35,769 --> 00:00:39,272  
in the lower atmosphere,  
which dropped about 2% globally.

10  
00:00:40,206 --> 00:00:43,443  
And while this may seem small,  
such a drop in harmful

11  
00:00:43,443 --> 00:00:46,646

ozone would take about 15 years  
to achieve under even

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00:00:46,646 --> 00:00:49,382

the most aggressive  
emission control scenarios.

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00:00:50,283 --> 00:00:54,120

Interestingly enough, the team found that  
these drops were not uniform

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00:00:54,120 --> 00:00:55,255

across the globe.

15

00:00:55,255 --> 00:00:57,090

That where and when the lockdowns

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00:00:57,090 --> 00:01:00,660

occurred was very important in determining  
the impact on the atmosphere.

17

00:01:01,194 --> 00:01:04,431

Taking a look at these regions  
with blue representing below

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00:01:04,431 --> 00:01:06,766

normal levels of ozone  
in the lower atmosphere,

19

00:01:07,100 --> 00:01:09,803

we could see that both Asia  
and the United States have

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00:01:09,803 --> 00:01:13,139

a substantial impact  
on harmful global ozone levels.

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00:01:14,207 --> 00:01:15,375

Factors like prevailing

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00:01:15,375 --> 00:01:19,312

winds, air temperature  
and moisture content all impact

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00:01:19,312 --> 00:01:22,415

how efficiently ozone is produced  
and moves

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00:01:22,415 --> 00:01:23,983

throughout the globe.

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00:01:27,587 --> 00:01:31,458

Like ozone, CO<sub>2</sub> is a long lived gas  
that is easily

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00:01:31,458 --> 00:01:35,662

transported through the atmosphere,  
which means that any changes in emissions

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00:01:35,662 --> 00:01:39,232

is mixed with many different influences  
from both near and far.

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00:01:40,567 --> 00:01:43,937

This makes it challenging to track  
and measure how local changes in

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00:01:43,937 --> 00:01:47,607

human activity actually impact the levels  
of this greenhouse gas.

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00:01:49,709 --> 00:01:53,480

Using NASA's OCO -2 instrument  
and the GEOS model, NASA

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00:01:53,480 --> 00:01:58,017

researchers were able to spot short-term  
regional fluctuations in the atmosphere

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00:01:58,351 --> 00:02:01,921  
due to drops in human activity  
related to the lockdowns.

33  
00:02:02,922 --> 00:02:05,191  
This is the first time changes in CO2

34  
00:02:05,191 --> 00:02:08,728  
measurements have been tracked  
at such a scale all over the globe.

35  
00:02:10,263 --> 00:02:11,231  
The team's results

36  
00:02:11,231 --> 00:02:15,401  
showed that the CO2 emissions dropped  
significantly in the Northern Hemisphere

37  
00:02:15,401 --> 00:02:18,771  
from February through  
May and rebounded during the summer

38  
00:02:18,771 --> 00:02:22,175  
when some restrictions eased.

39  
00:02:23,176 --> 00:02:23,910  
The team

40  
00:02:23,910 --> 00:02:27,914  
was also able to better distinguish  
which monthly CO2 fluctuations

41  
00:02:27,914 --> 00:02:31,184  
were due to human activities  
and which were due to natural causes,

42  
00:02:31,518 --> 00:02:34,787  
like the Australian wildfires  
and ocean circulation patterns.

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00:02:35,788 --> 00:02:39,692

This is important because distinguishing  
between human and natural causes

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00:02:39,926 --> 00:02:43,730

is a critical step towards measuring  
human activities' collective effects

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00:02:43,730 --> 00:02:46,299

on CO2 emissions in near real time.

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00:02:48,301 --> 00:02:52,272

The lockdown surrounding COVID 19  
were an unprecedented global event

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00:02:52,272 --> 00:02:56,509

that highlighted the complex relationships  
between emissions and the atmosphere.

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00:02:56,910 --> 00:02:57,710

By studying

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00:02:57,710 --> 00:03:01,514

these relationships, we can gain insights  
that could help us better design