WEBVTT

NOTE duration:”00:54:38.7400000”

NOTE recognizability:0.839

NOTE language:en-us

NOTE Confidence: 0.825363786666667

00:00:00.000 --> 00:00:03.768 Today is my great pleasure and

NOTE Confidence: 0.825363786666667

00:00:03.770 --> 00:00:06.050 to introduce to this speaker,

NOTE Confidence: 0.825363786666667

00:00:06.050 --> 00:00:08.210 doctor Susan Annenberg.

NOTE Confidence: 0.825363786666667

00:00:08.210 --> 00:00:11.180 Susan is associate professor and chair

NOTE Confidence: 0.825363786666667

00:00:11.180 --> 00:00:14.021 of the Department of Environmental

NOTE Confidence: 0.825363786666667

00:00:14.021 --> 00:00:17.706 and Occupational Health in the George

NOTE Confidence: 0.825363786666667

00:00:17.706 --> 00:00:19.966 Washington University and she's also

NOTE Confidence: 0.825363786666667

00:00:19.966 --> 00:00:23.576 the current director of the DW PAN and

NOTE Confidence: 0.825363786666667

00:00:23.576 --> 00:00:27.250 Health Initiative Institute and Doctor.

NOTE Confidence: 0.825363786666667

00:00:27.250 --> 00:00:28.885 August Research focus on the

NOTE Confidence: 0.825363786666667

00:00:28.885 --> 00:00:30.193 health implications of air

NOTE Confidence: 0.825363786666667

00:00:30.193 --> 00:00:31.530 pollution and climate change,

NOTE Confidence: 0.825363786666667

00:00:31.530 --> 00:00:34.836 from both local to global skills.

NOTE Confidence: 0.825363786666667

00:00:34.840 --> 00:00:36.964 And we talk a lot about

NOTE Confidence: 0.825363786666667

00:00:36.964 --> 00:00:38.026 like policy implications.

NOTE Confidence: 0.825363786666667

00:00:38.030 --> 00:00:40.490 And Doctor Annenberg is really

NOTE Confidence: 0.825363786666667

00:00:40.490 --> 00:00:43.436 the true pioneer of making the

NOTE Confidence: 0.825363786666667

00:00:43.436 --> 00:00:45.876 science of this policy relevant.

NOTE Confidence: 0.825363786666667

00:00:45.880 --> 00:00:49.344 So she serves on the US EPA Science

NOTE Confidence: 0.825363786666667

00:00:49.344 --> 00:00:52.110 Advisory Board and the Clean Air

NOTE Confidence: 0.825363786666667

00:00:52.110 --> 00:00:54.816 Act Advisory Committee and The Who

NOTE Confidence: 0.825363786666667

00:00:54.906 --> 00:00:57.681 Global air pollution and Health

NOTE Confidence: 0.825363786666667

00:00:57.681 --> 00:01:00.456 Technical Advisory Group and the

NOTE Confidence: 0.825363786666667

00:01:00.460 --> 00:01:02.495 National Academy of Sciences Committee

NOTE Confidence: 0.825363786666667

00:01:02.495 --> 00:01:05.060 to advise the US Global change.

NOTE Confidence: 0.825363786666667

00:01:05.060 --> 00:01:05.962 Research programs.

NOTE Confidence: 0.825363786666667

00:01:05.962 --> 00:01:08.668 She also serves as currently the

NOTE Confidence: 0.825363786666667

00:01:08.668 --> 00:01:11.435 President of the Jail House section

NOTE Confidence: 0.825363786666667

00:01:11.435 --> 00:01:13.670 of the American Geophysical Union.

NOTE Confidence: 0.825363786666667

00:01:13.670 --> 00:01:14.850 So without first deal,

NOTE Confidence: 0.825363786666667

00:01:14.850 --> 00:01:16.030 let's welcome those energy.

NOTE Confidence: 0.821119668

00:01:18.890 --> 00:01:20.630 And for being here today,

NOTE Confidence: 0.821119668

00:01:20.630 --> 00:01:22.695 I really appreciate you taking the time

NOTE Confidence: 0.821119668

00:01:22.695 --> 00:01:24.910 out of your days to to to be here.

NOTE Confidence: 0.821119668

00:01:24.910 --> 00:01:27.035 So I'm Susan Annenberg from

NOTE Confidence: 0.821119668

00:01:27.035 --> 00:01:28.310 George Washington University,

NOTE Confidence: 0.821119668

00:01:28.310 --> 00:01:30.530 and I will be talking today

NOTE Confidence: 0.821119668

00:01:30.530 --> 00:01:32.010 about linking climate change,

NOTE Confidence: 0.821119668

00:01:32.010 --> 00:01:33.738 air pollution and human health and

NOTE Confidence: 0.821119668

00:01:33.738 --> 00:01:35.290 bridging science to the policy,

NOTE Confidence: 0.821119668

00:01:35.290 --> 00:01:36.900 which is really what I'm

NOTE Confidence: 0.821119668

00:01:36.900 --> 00:01:38.188 very passionate about doing.

NOTE Confidence: 0.600709146666667

00:01:43.720 --> 00:01:44.668 Shape that, people.

NOTE Confidence: 0.848036556

00:01:47.090 --> 00:01:49.950 OK, so before I start,

NOTE Confidence: 0.848036556

00:01:49.950 --> 00:01:51.520 let me just say that a lot of the work

NOTE Confidence: 0.848036556

00:01:51.565 --> 00:01:53.221 that I'm going to show today is really

NOTE Confidence: 0.848036556

00:01:53.221 --> 00:01:54.668 standing on the shoulders of giants.

NOTE Confidence: 0.848036556

00:01:54.670 --> 00:01:56.931 This is work that would not be

NOTE Confidence: 0.848036556

00:01:56.931 --> 00:01:58.992 possible without the people who have

NOTE Confidence: 0.848036556

00:01:58.992 --> 00:02:01.258 spent many years that, you know,

NOTE Confidence: 0.848036556

00:02:01.258 --> 00:02:03.034 detecting associations between air

NOTE Confidence: 0.848036556

00:02:03.034 --> 00:02:04.810 pollutants and health outcomes,

NOTE Confidence: 0.848036556

00:02:04.810 --> 00:02:06.406 developing air pollution exposure

NOTE Confidence: 0.848036556

00:02:06.406 --> 00:02:08.800 datasets that are open and publicly

NOTE Confidence: 0.848036556

00:02:08.867 --> 00:02:10.487 available for others to use.

NOTE Confidence: 0.848036556

00:02:10.490 --> 00:02:11.685 And I appreciate the efforts

NOTE Confidence: 0.848036556

00:02:11.685 --> 00:02:13.522 of many people in this room and

NOTE Confidence: 0.848036556

00:02:13.522 --> 00:02:14.710 contributing to that science.

NOTE Confidence: 0.848036556

00:02:14.710 --> 00:02:17.860 And this really makes the the bridging.

NOTE Confidence: 0.848036556

00:02:17.860 --> 00:02:20.410 From science to the policy possible

NOTE Confidence: 0.848036556

00:02:20.410 --> 00:02:22.611 by creating these datasets and

NOTE Confidence: 0.848036556

00:02:22.611 --> 00:02:24.726 associations that others can use.

NOTE Confidence: 0.848036556

00:02:24.730 --> 00:02:26.992 But based on the information that

NOTE Confidence: 0.848036556

00:02:26.992 --> 00:02:29.158 we have from Epidemia epidemiology

NOTE Confidence: 0.848036556

00:02:29.158 --> 00:02:30.907 and exposure science,

NOTE Confidence: 0.848036556

00:02:30.910 --> 00:02:32.824 we know that air pollution continues

NOTE Confidence: 0.848036556

00:02:32.824 --> 00:02:34.914 to be a leading health risk

NOTE Confidence: 0.848036556

00:02:34.914 --> 00:02:36.794 factor in nearly all countries.

NOTE Confidence: 0.848036556

00:02:36.800 --> 00:02:38.520 Is currently considered to be

NOTE Confidence: 0.848036556

00:02:38.520 --> 00:02:40.240 the 4th leading risk factor

NOTE Confidence: 0.848036556

00:02:40.300 --> 00:02:41.929 affecting global mortality.

NOTE Confidence: 0.848036556

00:02:41.930 --> 00:02:43.805 That's not the 4th leading

NOTE Confidence: 0.848036556

00:02:43.805 --> 00:02:44.930 environmental risk factor.

NOTE Confidence: 0.848036556

00:02:44.930 --> 00:02:47.870 That's the 4th leading overall risk factor.

NOTE Confidence: 0.848036556

00:02:47.870 --> 00:02:49.998 And and really indicates that air pollution

NOTE Confidence: 0.848036556

00:02:49.998 --> 00:02:52.793 needs to be central on the global health

NOTE Confidence: 0.848036556

00:02:52.793 --> 00:02:54.618 agenda for improving people's health.

NOTE Confidence: 0.848036556

00:02:54.620 --> 00:02:56.811 And if you look at the diseases

NOTE Confidence: 0.848036556

00:02:56.811 --> 00:02:58.320 that air pollution impacts,

NOTE Confidence: 0.848036556

00:02:58.320 --> 00:03:01.029 it is not a small fraction of these diseases

NOTE Confidence: 0.848036556

00:03:01.029 --> 00:03:03.417 that air pollution is responsible for.

NOTE Confidence: 0.848036556

00:03:03.420 --> 00:03:05.684 I mean this is a, you know,

NOTE Confidence: 0.848036556

00:03:05.684 --> 00:03:07.916 40% of chronic obstructive pulmonary disease,

NOTE Confidence: 0.848036556

00:03:07.920 --> 00:03:08.841 20% of diabetes,

NOTE Confidence: 0.848036556

00:03:08.841 --> 00:03:11.344 20% of ischemic heart disease and you can

NOTE Confidence: 0.848036556

00:03:11.344 --> 00:03:13.720 read the rest of the the percentages there.

NOTE Confidence: 0.848036556

00:03:13.720 --> 00:03:15.844 So this is a preventable risk

NOTE Confidence: 0.848036556

00:03:15.844 --> 00:03:18.550 factor that it is responsible for.

NOTE Confidence: 0.848036556

00:03:18.550 --> 00:03:19.962 Millions of premature deaths

NOTE Confidence: 0.848036556

00:03:19.962 --> 00:03:21.727 globally and a very large,

NOTE Confidence: 0.848036556

00:03:21.730 --> 00:03:25.600 very substantial fraction of the incidence

NOTE Confidence: 0.848036556

00:03:25.600 --> 00:03:29.250 of these diseases around the world.

NOTE Confidence: 0.848036556

00:03:29.250 --> 00:03:31.422 And we also know that climate

NOTE Confidence: 0.848036556

00:03:31.422 --> 00:03:32.870 change worsens air pollution.

NOTE Confidence: 0.848036556

00:03:32.870 --> 00:03:34.895 So climate change is contributing

NOTE Confidence: 0.848036556

00:03:34.895 --> 00:03:36.110 to worsening ozone,

NOTE Confidence: 0.848036556

00:03:36.110 --> 00:03:38.030 increased wildfire smoke,

NOTE Confidence: 0.848036556

00:03:38.030 --> 00:03:39.310 increased dust,

NOTE Confidence: 0.848036556

00:03:39.310 --> 00:03:40.876 worsened allergy conditions,

NOTE Confidence: 0.848036556

00:03:40.876 --> 00:03:42.964 and even potentially impacting

NOTE Confidence: 0.848036556

00:03:42.964 --> 00:03:44.530 airborne infectious diseases,

NOTE Confidence: 0.848036556

00:03:44.530 --> 00:03:46.930 both the spread and the severity

NOTE Confidence: 0.848036556

00:03:46.930 --> 00:03:48.530 of airborne infectious diseases.

NOTE Confidence: 0.848036556

00:03:48.530 --> 00:03:50.745 So air pollution and climate

NOTE Confidence: 0.848036556

00:03:50.745 --> 00:03:52.517 change are highly interlinked.

NOTE Confidence: 0.848036556

00:03:52.520 --> 00:03:54.067 This is just one of the ways

NOTE Confidence: 0.848036556

00:03:54.067 --> 00:03:54.730 that they're interlinked,

NOTE Confidence: 0.848036556

00:03:54.730 --> 00:03:55.996 and we're going to talk about

NOTE Confidence: 0.848036556

00:03:55.996 --> 00:03:56.840 some of the others.

NOTE Confidence: 0.848036556

00:03:56.840 --> 00:03:59.186 But climate change is now worsening.

NOTE Confidence: 0.848036556

00:03:59.190 --> 00:04:00.605 Air pollution making it harder

NOTE Confidence: 0.848036556

00:04:00.605 --> 00:04:02.300 for us to protect the air,

NOTE Confidence: 0.848036556

00:04:02.300 --> 00:04:04.625 making it healthy for people

NOTE Confidence: 0.848036556

00:04:04.625 --> 00:04:06.485 to breathe and and.

NOTE Confidence: 0.848036556

00:04:06.490 --> 00:04:09.030 One of the ways that we one of the most

NOTE Confidence: 0.848036556

00:04:09.099 --> 00:04:11.403 prominent effects of climate change on

NOTE Confidence: 0.848036556

00:04:11.403 --> 00:04:13.990 air pollution is now wildfire smoke.

NOTE Confidence: 0.848036556

00:04:13.990 --> 00:04:15.694 So I just want to look at some

NOTE Confidence: 0.848036556

00:04:15.694 --> 00:04:17.359 of the most recent work that I

NOTE Confidence: 0.848036556

00:04:17.359 --> 00:04:19.842 was a part of looking at PM 2.5,

NOTE Confidence: 0.848036556

00:04:19.842 --> 00:04:20.608 you know,

NOTE Confidence: 0.848036556

00:04:20.610 --> 00:04:22.158 very fine particle concentrations

NOTE Confidence: 0.848036556

00:04:22.158 --> 00:04:23.706 across the United States,

NOTE Confidence: 0.848036556

00:04:23.710 --> 00:04:25.866 the Eastern US and then the Western

NOTE Confidence: 0.848036556

00:04:25.866 --> 00:04:28.681 US and we see across the the last

NOTE Confidence: 0.848036556

00:04:28.681 --> 00:04:31.050 couple decades for the United States,

NOTE Confidence: 0.848036556

00:04:31.050 --> 00:04:32.738 PM 2.5 concentrations have

NOTE Confidence: 0.848036556

00:04:32.738 --> 00:04:34.004 been declining substantially.

NOTE Confidence: 0.848036556

00:04:34.010 --> 00:04:36.719 That's a huge public health win and.

NOTE Confidence: 0.848036556

00:04:36.720 --> 00:04:39.891 Is the result of many years of

NOTE Confidence: 0.848036556

00:04:39.891 --> 00:04:41.713 effective regulations under the

NOTE Confidence: 0.848036556

00:04:41.713 --> 00:04:44.380 Clean Air Act in the United States.

NOTE Confidence: 0.848036556

00:04:44.380 --> 00:04:46.420 So PM 2.5 concentrations have been

NOTE Confidence: 0.848036556

00:04:46.420 --> 00:04:48.151 declining substantially and even more

NOTE Confidence: 0.848036556

00:04:48.151 --> 00:04:49.716 substantially in the eastern US,

NOTE Confidence: 0.858857471666666

00:04:49.720 --> 00:04:51.634 where we have very strong anthropogenic

NOTE Confidence: 0.858857471666666

00:04:51.634 --> 00:04:53.250 emissions that have been controlled

NOTE Confidence: 0.858857471666666

00:04:53.250 --> 00:04:55.273 from our power plants and our vehicles

NOTE Confidence: 0.858857471666666

00:04:55.273 --> 00:04:57.047 over the last couple of decades.

NOTE Confidence: 0.858857471666666

00:04:57.050 --> 00:04:58.835 And we've seen this very dramatic decrease.

NOTE Confidence: 0.858857471666666

00:04:58.840 --> 00:05:00.600 Again, 2.5 crowded Eastern

NOTE Confidence: 0.858857471666666

00:05:00.600 --> 00:05:02.800 US in the western US,

NOTE Confidence: 0.858857471666666

00:05:02.800 --> 00:05:04.915 we have a different story here with a lot

NOTE Confidence: 0.858857471666666

00:05:04.915 --> 00:05:07.247 of interannual variability in those PM 2.

NOTE Confidence: 0.858857471666666

00:05:07.250 --> 00:05:10.362 25 concentrations in the last 5-10 years,

NOTE Confidence: 0.858857471666666

00:05:10.362 --> 00:05:12.798 and that's driven by wildfire smoke.

NOTE Confidence: 0.858857471666666

00:05:12.800 --> 00:05:14.676 If you draw a line through this

NOTE Confidence: 0.858857471666666

00:05:14.676 --> 00:05:16.130 very large interannual variability,

NOTE Confidence: 0.858857471666666

00:05:16.130 --> 00:05:18.265 you see that PM 2.5 concentrations are

NOTE Confidence: 0.858857471666666

00:05:18.265 --> 00:05:19.988 actually increasing in the Western US,

NOTE Confidence: 0.858857471666666

00:05:19.990 --> 00:05:21.378 despite the very effective

NOTE Confidence: 0.858857471666666

00:05:21.378 --> 00:05:23.460 regulations that we have on power

NOTE Confidence: 0.858857471666666

00:05:23.527 --> 00:05:25.437 plants and industry and vehicles.

NOTE Confidence: 0.858857471666666

00:05:25.440 --> 00:05:27.112 And that different disparate

NOTE Confidence: 0.858857471666666

00:05:27.112 --> 00:05:29.620 picture between the western US and

NOTE Confidence: 0.858857471666666

00:05:29.691 --> 00:05:31.854 the eastern US is driving what we

NOTE Confidence: 0.858857471666666

00:05:31.854 --> 00:05:34.200 see here for the US on average,

NOTE Confidence: 0.858857471666666

00:05:34.200 --> 00:05:37.060 that we actually see that the PM 2.5

NOTE Confidence: 0.858857471666666

00:05:37.060 --> 00:05:39.100 concentrations are beginning to flatten out.

NOTE Confidence: 0.858857471666666

00:05:39.100 --> 00:05:40.582 They're not declining to the same

NOTE Confidence: 0.858857471666666

00:05:40.582 --> 00:05:42.100 degree as they have been for

NOTE Confidence: 0.858857471666666

00:05:42.100 --> 00:05:43.300 the past couple of decades.

NOTE Confidence: 0.858857471666666

00:05:43.300 --> 00:05:45.208 We're actually seeing that they're starting

NOTE Confidence: 0.858857471666666

00:05:45.208 --> 00:05:47.309 to stagnate in the coming decades.

NOTE Confidence: 0.858857471666666

00:05:47.310 --> 00:05:48.878 We might actually start to see that

NOTE Confidence: 0.858857471666666

00:05:48.878 --> 00:05:50.050 they're starting to rise again.

NOTE Confidence: 0.858857471666666

00:05:50.050 --> 00:05:51.779 And this makes it more difficult for

NOTE Confidence: 0.858857471666666

00:05:51.779 --> 00:05:53.564 us to attain our national ambient

NOTE Confidence: 0.858857471666666

00:05:53.564 --> 00:05:56.004 air quality standards for PM 2.5

NOTE Confidence: 0.858857471666666

00:05:56.004 --> 00:05:58.789 because of this climate induced

NOTE Confidence: 0.858857471666666

00:05:58.789 --> 00:06:01.809 change and wildfire smoke keeping

NOTE Confidence: 0.858857471666666

00:06:01.810 --> 00:06:03.154 PM 2.5 concentrations high.

NOTE Confidence: 0.858857471666666

00:06:03.154 --> 00:06:06.070 I had the honor of working with the

NOTE Confidence: 0.858857471666666

00:06:06.070 --> 00:06:08.155 US Environmental Protection Agency on

NOTE Confidence: 0.858857471666666

00:06:08.155 --> 00:06:10.741 their climate change impacts and risk

NOTE Confidence: 0.858857471666666

00:06:10.741 --> 00:06:12.586 analysis project, their Sierra project.

NOTE Confidence: 0.858857471666666

00:06:12.586 --> 00:06:14.910 I used to actually work at the

NOTE Confidence: 0.858857471666666

00:06:14.979 --> 00:06:16.501 EPA from 2010 to 2014,

NOTE Confidence: 0.858857471666666

00:06:16.501 --> 00:06:18.186 and when I was there,

NOTE Confidence: 0.858857471666666

00:06:18.190 --> 00:06:20.465 we were starting this project to quantify

NOTE Confidence: 0.858857471666666

00:06:20.465 --> 00:06:22.040 the different damages of climate

NOTE Confidence: 0.858857471666666

00:06:22.040 --> 00:06:23.930 change on life in the United States,

NOTE Confidence: 0.858857471666666

00:06:23.930 --> 00:06:25.660 and that includes air pollution,

NOTE Confidence: 0.858857471666666

00:06:25.660 --> 00:06:27.484 but it also includes a lot of other

NOTE Confidence: 0.858857471666666

00:06:27.484 --> 00:06:29.347 things like labor and extreme temperature

NOTE Confidence: 0.858857471666666

00:06:29.347 --> 00:06:30.703 mortality and coastal property

NOTE Confidence: 0.858857471666666

00:06:30.703 --> 00:06:33.390 and roads and back at that time,

NOTE Confidence: 0.858857471666666

00:06:33.390 --> 00:06:34.326 the only.

NOTE Confidence: 0.858857471666666

00:06:34.326 --> 00:06:37.134 Estimate of how climate change impacted

NOTE Confidence: 0.858857471666666

00:06:37.134 --> 00:06:39.396 air pollution and therefore damages

NOTE Confidence: 0.858857471666666

00:06:39.396 --> 00:06:43.130 through human health in the US was via ozone.

NOTE Confidence: 0.858857471666666

00:06:43.130 --> 00:06:47.018 So temperature worsens ozone and that

NOTE Confidence: 0.858857471666666

00:06:47.018 --> 00:06:49.610 contributes to premature mortality.

NOTE Confidence: 0.858857471666666

00:06:49.610 --> 00:06:53.711 And you can see that that back in about 2014,

NOTE Confidence: 0.858857471666666

00:06:53.711 --> 00:06:54.112 2015,

NOTE Confidence: 0.858857471666666

00:06:54.112 --> 00:06:56.518 air quality was the 4th largest

NOTE Confidence: 0.858857471666666

00:06:56.518 --> 00:06:59.213 damage of climate change in the

NOTE Confidence: 0.858857471666666

00:06:59.213 --> 00:07:01.029 United States once valued.

NOTE Confidence: 0.858857471666666

00:07:01.030 --> 00:07:03.028 But we really recognized, you know,

NOTE Confidence: 0.858857471666666

00:07:03.030 --> 00:07:04.812 we also think that climate change

NOTE Confidence: 0.858857471666666

00:07:04.812 --> 00:07:05.406 is influencing.

NOTE Confidence: 0.858857471666666

00:07:05.410 --> 00:07:05.727 Yeah,

NOTE Confidence: 0.858857471666666

00:07:05.727 --> 00:07:08.263 2.5 and PM 2.5 has a very strong

NOTE Confidence: 0.858857471666666

00:07:08.263 --> 00:07:10.199 relationship with premature mortality.

NOTE Confidence: 0.858857471666666

00:07:10.200 --> 00:07:12.096 So if we were able to quantify the

NOTE Confidence: 0.858857471666666

00:07:12.096 --> 00:07:13.938 impacts of climate change on PM 2.5,

NOTE Confidence: 0.858857471666666

00:07:13.940 --> 00:07:15.332 in addition to ozone,

NOTE Confidence: 0.858857471666666

00:07:15.332 --> 00:07:17.960 we likely would get an A large,

NOTE Confidence: 0.858857471666666

00:07:17.960 --> 00:07:19.152 potentially a larger number.

NOTE Confidence: 0.858857471666666

00:07:19.152 --> 00:07:21.340 We would likely get a different number.

NOTE Confidence: 0.858857471666666

00:07:21.340 --> 00:07:22.549 Back in 2015,

NOTE Confidence: 0.858857471666666

00:07:22.549 --> 00:07:24.967 climate models were still very uncertain

NOTE Confidence: 0.858857471666666

00:07:24.967 --> 00:07:27.598 about where the precipitation happens,

NOTE Confidence: 0.858857471666666

00:07:27.600 --> 00:07:29.412 what's going to happen to PM

NOTE Confidence: 0.858857471666666

00:07:29.412 --> 00:07:30.620 2.5 in different locations.

NOTE Confidence: 0.858857471666666

00:07:30.620 --> 00:07:33.476 And that still remains a a big uncertainty.

NOTE Confidence: 0.858857471666666

00:07:33.480 --> 00:07:35.262 But we do know that climate

NOTE Confidence: 0.858857471666666

00:07:35.262 --> 00:07:36.153 change is driving.

NOTE Confidence: 0.858857471666666

00:07:36.160 --> 00:07:39.180 Quote UN quote natural sources of PM 2.5,

NOTE Confidence: 0.858857471666666

00:07:39.180 --> 00:07:40.460 which are no longer,

NOTE Confidence: 0.858857471666666

00:07:40.460 --> 00:07:43.036 I think can no longer be considered

NOTE Confidence: 0.858857471666666

00:07:43.036 --> 00:07:44.650 fully natural anymore because

NOTE Confidence: 0.858857471666666

00:07:44.650 --> 00:07:46.855 climate change is impacting them.

NOTE Confidence: 0.791719071428571

00:07:46.860 --> 00:07:49.898 So dust exposure in the southwest US,

NOTE Confidence: 0.791719071428571

00:07:49.900 --> 00:07:52.596 Wildfire PM 2.5, which we just talked about.

NOTE Confidence: 0.791719071428571

00:07:52.600 --> 00:07:54.752 So I partnered with the EPA and a

NOTE Confidence: 0.791719071428571

00:07:54.752 --> 00:07:57.034 number of other scientists and we

NOTE Confidence: 0.791719071428571

00:07:57.034 --> 00:07:59.129 quantified the potential damages of

NOTE Confidence: 0.791719071428571

00:07:59.129 --> 00:08:01.624 climate change on dust exposure and

NOTE Confidence: 0.791719071428571

00:08:01.624 --> 00:08:04.102 therefore premature mortality in the US

NOTE Confidence: 0.791719071428571

00:08:04.102 --> 00:08:06.934 and same with wildfire smoke exposure.

NOTE Confidence: 0.791719071428571

00:08:06.940 --> 00:08:08.200 And we valued that.

NOTE Confidence: 0.791719071428571

00:08:08.200 --> 00:08:11.446 And we came up with about $47 billion a

NOTE Confidence: 0.791719071428571

00:08:11.446 --> 00:08:13.581 year from climate induced contributions

NOTE Confidence: 0.791719071428571

00:08:13.581 --> 00:08:16.648 to dust exposure and its effects on

NOTE Confidence: 0.791719071428571

00:08:16.648 --> 00:08:18.783 premature mortality and about $25

NOTE Confidence: 0.791719071428571

00:08:18.790 --> 00:08:21.226 billion a year for wildfire smoke.

NOTE Confidence: 0.791719071428571

00:08:21.230 --> 00:08:22.838 And if you add those together

NOTE Confidence: 0.791719071428571

00:08:22.838 --> 00:08:25.034 with the ozone impact that we had

NOTE Confidence: 0.791719071428571

00:08:25.034 --> 00:08:25.748 previously quantified,

NOTE Confidence: 0.791719071428571

00:08:25.750 --> 00:08:28.344 we see that air pollution is one

NOTE Confidence: 0.791719071428571

00:08:28.344 --> 00:08:30.786 of the largest damages of climate

NOTE Confidence: 0.791719071428571

00:08:30.786 --> 00:08:33.148 change in the United States.

NOTE Confidence: 0.791719071428571

00:08:33.150 --> 00:08:35.194 And this is an estimate that I

NOTE Confidence: 0.791719071428571

00:08:35.194 --> 00:08:37.170 think is likely to grow, I think.

NOTE Confidence: 0.791719071428571

00:08:37.170 --> 00:08:38.990 We underestimated this impact due to the

NOTE Confidence: 0.791719071428571

00:08:38.990 --> 00:08:40.757 methods that were available at the time,

NOTE Confidence: 0.791719071428571

00:08:40.760 --> 00:08:42.923 so I think this number is likely

NOTE Confidence: 0.791719071428571

00:08:42.923 --> 00:08:43.850 to get larger.

NOTE Confidence: 0.791719071428571

00:08:43.850 --> 00:08:45.902 Another reason it's underestimating

NOTE Confidence: 0.791719071428571

00:08:45.902 --> 00:08:48.467 the damages of climate change

NOTE Confidence: 0.791719071428571

00:08:48.467 --> 00:08:50.950 on air pollution is because.

NOTE Confidence: 0.791719071428571

00:08:50.950 --> 00:08:53.148 We can't just add together the impacts

NOTE Confidence: 0.791719071428571

00:08:53.148 --> 00:08:55.754 of heat on mortality and the impacts

NOTE Confidence: 0.791719071428571

00:08:55.754 --> 00:08:57.749 of air pollution on mortality.

NOTE Confidence: 0.791719071428571

00:08:57.750 --> 00:09:00.330 These actually have synergistic effects.

NOTE Confidence: 0.791719071428571

00:09:00.330 --> 00:09:02.466 So the total impact of increased

NOTE Confidence: 0.791719071428571

00:09:02.466 --> 00:09:04.275 heat and increased air pollution

NOTE Confidence: 0.791719071428571

00:09:04.275 --> 00:09:06.803 is more than the sum of its parts.

NOTE Confidence: 0.791719071428571

00:09:06.810 --> 00:09:08.610 In the previous slide I just showed you

NOTE Confidence: 0.791719071428571

00:09:08.610 --> 00:09:10.422 we were only capturing the impact of

NOTE Confidence: 0.791719071428571

00:09:10.422 --> 00:09:12.410 each of these risk factors individually,

NOTE Confidence: 0.791719071428571

00:09:12.410 --> 00:09:13.666 not considering the others.

NOTE Confidence: 0.791719071428571

00:09:13.666 --> 00:09:15.550 But because we know that there

NOTE Confidence: 0.791719071428571

00:09:15.612 --> 00:09:17.240 are these synergistic effects,

NOTE Confidence: 0.791719071428571

00:09:17.240 --> 00:09:19.496 we're likely missing some of these

NOTE Confidence: 0.791719071428571

00:09:19.496 --> 00:09:21.690 damages of both heat exposure.

NOTE Confidence: 0.791719071428571

00:09:21.690 --> 00:09:22.605 And air pollution.

NOTE Confidence: 0.791719071428571

00:09:22.605 --> 00:09:24.740 And as more research comes out looking

NOTE Confidence: 0.791719071428571

00:09:24.794 --> 00:09:26.396 at the pollen impacts as well,

NOTE Confidence: 0.791719071428571

00:09:26.400 --> 00:09:28.350 I think that could be potentially

NOTE Confidence: 0.791719071428571

00:09:28.350 --> 00:09:31.120 a factor to consider here too.

NOTE Confidence: 0.791719071428571

00:09:31.120 --> 00:09:33.442 So I talked about how there's

NOTE Confidence: 0.791719071428571

00:09:33.442 --> 00:09:34.990 different links between climate

NOTE Confidence: 0.791719071428571

00:09:35.054 --> 00:09:36.638 change and air pollution.

NOTE Confidence: 0.791719071428571

00:09:36.640 --> 00:09:37.790 We talked about this one,

NOTE Confidence: 0.791719071428571

00:09:37.790 --> 00:09:40.198 how climate change can impact air pollution.

NOTE Confidence: 0.791719071428571

00:09:40.200 --> 00:09:42.454 Air pollution can also impact climate change.

NOTE Confidence: 0.791719071428571

00:09:42.460 --> 00:09:43.918 We have short lived climate pollutants,

NOTE Confidence: 0.791719071428571

00:09:43.920 --> 00:09:45.990 for example black carbon and

NOTE Confidence: 0.791719071428571

00:09:45.990 --> 00:09:48.060 methane that contributes to poor

NOTE Confidence: 0.791719071428571

00:09:48.136 --> 00:09:50.380 air quality and warm the climate.

NOTE Confidence: 0.791719071428571

00:09:50.380 --> 00:09:51.712 This arrow here is.

NOTE Confidence: 0.791719071428571

00:09:51.712 --> 00:09:53.710 Sorry should go from climate change

NOTE Confidence: 0.791719071428571

00:09:53.771 --> 00:09:54.800 to public health.

NOTE Confidence: 0.791719071428571

00:09:54.800 --> 00:09:56.912 Not that the other association between

NOTE Confidence: 0.791719071428571

00:09:56.912 --> 00:09:58.651 climate change and air pollution

NOTE Confidence: 0.791719071428571

00:09:58.651 --> 00:10:00.819 that I want to talk about is how

NOTE Confidence: 0.791719071428571

00:10:00.819 --> 00:10:02.997 they share the same emission sources.

NOTE Confidence: 0.791719071428571

00:10:03.000 --> 00:10:04.720 Anytime we burn anything,

NOTE Confidence: 0.791719071428571

00:10:04.720 --> 00:10:07.300 primarily fossil fuels but also biofuels,

NOTE Confidence: 0.791719071428571

00:10:07.300 --> 00:10:08.920 we're releasing both airplanes

NOTE Confidence: 0.791719071428571

00:10:08.920 --> 00:10:10.135 and greenhouse gases.

NOTE Confidence: 0.791719071428571

00:10:10.140 --> 00:10:11.953 So if we want to address climate

NOTE Confidence: 0.791719071428571

00:10:11.953 --> 00:10:13.340 change and air pollution,

NOTE Confidence: 0.791719071428571

00:10:13.340 --> 00:10:16.028 we should be reducing the amount of

NOTE Confidence: 0.791719071428571

00:10:16.028 --> 00:10:19.144 fuel that is burned and therefore

NOTE Confidence: 0.791719071428571

00:10:19.144 --> 00:10:21.656 addressing those emission sources.

NOTE Confidence: 0.791719071428571

00:10:21.660 --> 00:10:23.753 What we've done so far in the

NOTE Confidence: 0.791719071428571

00:10:23.753 --> 00:10:24.920 United States by to.

NOTE Confidence: 0.791719071428571

00:10:24.920 --> 00:10:27.128 Bring down our PM 2.5 levels.

NOTE Confidence: 0.791719071428571

00:10:27.130 --> 00:10:28.774 We've tried to break this arrow

NOTE Confidence: 0.791719071428571

00:10:28.774 --> 00:10:30.569 between emission sources to air pollution.

NOTE Confidence: 0.791719071428571

00:10:30.570 --> 00:10:31.670 So we put catalytic

NOTE Confidence: 0.791719071428571

00:10:31.670 --> 00:10:32.770 converters on our vehicles.

NOTE Confidence: 0.791719071428571

00:10:32.770 --> 00:10:33.818 We put diesel particulate

NOTE Confidence: 0.791719071428571

00:10:33.818 --> 00:10:34.866 filters on our trucks,

NOTE Confidence: 0.791719071428571

00:10:34.870 --> 00:10:36.430 scrubbers on our power plants,

NOTE Confidence: 0.791719071428571

00:10:36.430 --> 00:10:38.212 and these have been very effective

NOTE Confidence: 0.791719071428571

00:10:38.212 --> 00:10:40.165 at reducing the amount of pollution

NOTE Confidence: 0.791719071428571

00:10:40.165 --> 00:10:41.589 from these emission sources.

NOTE Confidence: 0.791719071428571

00:10:41.590 --> 00:10:43.718 But they've done nothing to this era here.

NOTE Confidence: 0.89560463

00:10:43.720 --> 00:10:45.780 We're still continuing to make

NOTE Confidence: 0.89560463

00:10:45.780 --> 00:10:47.428 greenhouse gases largely unabated,

NOTE Confidence: 0.89560463

00:10:47.430 --> 00:10:49.242 and that climate change is contributing

NOTE Confidence: 0.89560463

00:10:49.242 --> 00:10:50.910 to the air pollution problem.

NOTE Confidence: 0.89560463

00:10:50.910 --> 00:10:53.534 So if we want to again mitigate both

NOTE Confidence: 0.89560463

00:10:53.534 --> 00:10:55.509 air pollution and climate change.

NOTE Confidence: 0.89560463

00:10:55.510 --> 00:10:57.064 We need to be burning less stuff,

NOTE Confidence: 0.89560463

00:10:57.070 --> 00:10:58.699 primarily fossil fuels,

NOTE Confidence: 0.89560463

00:10:58.699 --> 00:11:00.328 but also biofuels.

NOTE Confidence: 0.89560463

00:11:00.330 --> 00:11:01.890 I have focused a lot of my work,

NOTE Confidence: 0.89560463

00:11:01.890 --> 00:11:03.230 especially the most recent years,

NOTE Confidence: 0.89560463

00:11:03.230 --> 00:11:04.102 on the urban context,

NOTE Confidence: 0.89560463

00:11:04.102 --> 00:11:05.718 and the reason for that is because

NOTE Confidence: 0.89560463

00:11:05.718 --> 00:11:07.531 a lot of cities around the world

NOTE Confidence: 0.89560463

00:11:07.531 --> 00:11:08.868 are experiencing poor air quality.

NOTE Confidence: 0.89560463

00:11:08.870 --> 00:11:11.110 This is just a map of nitrogen

NOTE Confidence: 0.89560463

00:11:11.110 --> 00:11:12.530 dioxide concentrations in the US,

NOTE Confidence: 0.89560463

00:11:12.530 --> 00:11:15.743 but a lot of cities around the world are

NOTE Confidence: 0.89560463

00:11:15.743 --> 00:11:18.135 experiencing much greater levels of of

NOTE Confidence: 0.89560463

00:11:18.135 --> 00:11:21.050 pollution than we do in cities in the US,

NOTE Confidence: 0.89560463

00:11:21.050 --> 00:11:23.927 especially in cities in Africa and Asia,

NOTE Confidence: 0.89560463

00:11:23.930 --> 00:11:25.942 which are rapidly growing.

NOTE Confidence: 0.89560463

00:11:25.942 --> 00:11:27.451 These are experiencing

NOTE Confidence: 0.89560463

00:11:27.451 --> 00:11:29.540 rising air pollution levels.

NOTE Confidence: 0.89560463

00:11:29.540 --> 00:11:31.365 They're also, cities are also

NOTE Confidence: 0.89560463

00:11:31.365 --> 00:11:32.825 experiencing CO2 emissions growth.

NOTE Confidence: 0.89560463

00:11:32.830 --> 00:11:33.444 Right now,

NOTE Confidence: 0.89560463

00:11:33.444 --> 00:11:35.286 cities are responsible for about 3/4

NOTE Confidence: 0.89560463

00:11:35.286 --> 00:11:37.298 of global greenhouse gas emissions,

NOTE Confidence: 0.89560463

00:11:37.300 --> 00:11:39.544 and that's projected to rise as

NOTE Confidence: 0.89560463

00:11:39.544 --> 00:11:41.740 the world continues to urbanize.

NOTE Confidence: 0.89560463

00:11:41.740 --> 00:11:44.050 We also have very strong

NOTE Confidence: 0.89560463

00:11:44.050 --> 00:11:45.436 health inequality effects.

NOTE Confidence: 0.89560463

00:11:45.440 --> 00:11:47.155 So this is a map of Washington,

NOTE Confidence: 0.89560463

00:11:47.160 --> 00:11:48.292 DC, where I live.

NOTE Confidence: 0.89560463

00:11:48.292 --> 00:11:50.469 And the green colors here show the

NOTE Confidence: 0.89560463

00:11:50.469 --> 00:11:52.141 pediatric asthma emergency department

NOTE Confidence: 0.89560463

00:11:52.141 --> 00:11:54.231 visit rate for 10,000 people.

NOTE Confidence: 0.89560463

00:11:54.240 --> 00:11:56.550 And the red dots show life expectancy.

NOTE Confidence: 0.89560463

00:11:56.550 --> 00:11:59.262 We have about a 20 year life expectancy

NOTE Confidence: 0.89560463

00:11:59.262 --> 00:12:00.350 differential between neighborhoods

NOTE Confidence: 0.89560463

00:12:00.350 --> 00:12:02.800 in the southeast quadrant of the city

NOTE Confidence: 0.89560463

00:12:02.800 --> 00:12:04.673 right here versus neighborhoods in

NOTE Confidence: 0.89560463

00:12:04.673 --> 00:12:06.893 the northwest quadrant of the city.

NOTE Confidence: 0.89560463

00:12:06.900 --> 00:12:08.705 20 year life expectancy differential

NOTE Confidence: 0.89560463

00:12:08.705 --> 00:12:10.510 between people that live about

NOTE Confidence: 0.89560463

00:12:10.573 --> 00:12:12.139 2 miles away from each other.

NOTE Confidence: 0.89560463

00:12:12.140 --> 00:12:15.850 We also have very dramatic differences in

NOTE Confidence: 0.89560463

00:12:15.850 --> 00:12:19.177 pediatric asthma Ed visit rate as well.

NOTE Confidence: 0.89560463

00:12:19.180 --> 00:12:20.800 So this is just, you know,

NOTE Confidence: 0.89560463

00:12:20.800 --> 00:12:21.840 DC is not unique.

NOTE Confidence: 0.89560463

00:12:21.840 --> 00:12:23.140 We have problems for sure,

NOTE Confidence: 0.89560463

00:12:23.140 --> 00:12:24.192 but we're not unique.

NOTE Confidence: 0.89560463

00:12:24.192 --> 00:12:26.131 Most of the cities across the country

NOTE Confidence: 0.89560463

00:12:26.131 --> 00:12:27.985 are experiencing problems like this and

NOTE Confidence: 0.89560463

00:12:27.985 --> 00:12:30.360 then we have growth growing populations.

NOTE Confidence: 0.89560463

00:12:30.360 --> 00:12:32.236 So right now about half the world's

NOTE Confidence: 0.89560463

00:12:32.236 --> 00:12:33.680 population lives in urban areas.

NOTE Confidence: 0.89560463

00:12:33.680 --> 00:12:37.343 That's expected to grow to about 2/3 by 2050.

NOTE Confidence: 0.89560463

00:12:37.350 --> 00:12:40.129 And nearly all of that increase is

NOTE Confidence: 0.89560463

00:12:40.129 --> 00:12:42.196 anticipated to happen in African

NOTE Confidence: 0.89560463

00:12:42.196 --> 00:12:44.136 and Asian cities, where, again,

NOTE Confidence: 0.89560463

00:12:44.136 --> 00:12:46.747 pollution levels are also continuing to rise.

NOTE Confidence: 0.89560463

00:12:46.750 --> 00:12:49.606 So there's a lot of problems happening

NOTE Confidence: 0.89560463

00:12:49.606 --> 00:12:51.850 simultaneously in the urban context,

NOTE Confidence: 0.89560463

00:12:51.850 --> 00:12:54.454 and if we were to address the

NOTE Confidence: 0.89560463

00:12:54.454 --> 00:12:57.169 way that our cities burn fuel,

NOTE Confidence: 0.89560463

00:12:57.170 --> 00:12:59.452 we likely would be able to get

NOTE Confidence: 0.89560463

00:12:59.452 --> 00:13:01.589 at multiple of these problems.

NOTE Confidence: 0.89560463

00:13:01.590 --> 00:13:04.008 What we what we can't see,

NOTE Confidence: 0.89560463

00:13:04.010 --> 00:13:04.739 we can't fix.

NOTE Confidence: 0.89560463

00:13:04.739 --> 00:13:06.803 We have to be able to see the

NOTE Confidence: 0.89560463

00:13:06.803 --> 00:13:08.567 pollution in order to fix it.

NOTE Confidence: 0.89560463

00:13:08.570 --> 00:13:10.824 Right now this is where the monitoring

NOTE Confidence: 0.89560463

00:13:10.824 --> 00:13:12.450 happens for air pollution around

NOTE Confidence: 0.89560463

00:13:12.450 --> 00:13:14.834 the world you can see most of the

NOTE Confidence: 0.89560463

00:13:14.900 --> 00:13:16.930 monitors are in the US and Europe,

NOTE Confidence: 0.89560463

00:13:16.930 --> 00:13:20.269 and increasingly in China and in India.

NOTE Confidence: 0.89560463

00:13:20.270 --> 00:13:23.366 But much of the world is left uncovered.

NOTE Confidence: 0.89560463

00:13:23.370 --> 00:13:25.316 And even in places that look like

NOTE Confidence: 0.89560463

00:13:25.316 --> 00:13:26.790 they're densely covered by monitors,

NOTE Confidence: 0.89560463

00:13:26.790 --> 00:13:28.630 like take Washington DC,

NOTE Confidence: 0.89560463

00:13:28.630 --> 00:13:30.930 we only have 5 monitors,

NOTE Confidence: 0.89560463

00:13:30.930 --> 00:13:32.790 looks like 4, but two.

NOTE Confidence: 0.89560463

00:13:32.790 --> 00:13:34.792 We only have 5 monitors for the

NOTE Confidence: 0.89560463

00:13:34.792 --> 00:13:36.590 entire city of Washington DC,

NOTE Confidence: 0.89560463

00:13:36.590 --> 00:13:38.882 so how are we supposed to

NOTE Confidence: 0.89560463

00:13:38.882 --> 00:13:40.028 capture the inequality

NOTE Confidence: 0.855460437333333

00:13:40.030 --> 00:13:43.502 and pollution levels if we if these are

NOTE Confidence: 0.855460437333333

00:13:43.502 --> 00:13:47.337 this is our only source of information?

NOTE Confidence: 0.855460437333333

00:13:47.340 --> 00:13:50.020 Luckily, we have a new source of information

NOTE Confidence: 0.855460437333333

00:13:50.020 --> 00:13:52.460 which is Earth observing satellites.

NOTE Confidence: 0.855460437333333

00:13:52.460 --> 00:13:54.356 So NASA, the European Space Agency

NOTE Confidence: 0.855460437333333

00:13:54.356 --> 00:13:56.316 and other space agencies around the

NOTE Confidence: 0.855460437333333

00:13:56.316 --> 00:13:57.921 world have been launching satellites

NOTE Confidence: 0.855460437333333

00:13:57.921 --> 00:13:59.887 and they are constantly taking

NOTE Confidence: 0.855460437333333

00:13:59.887 --> 00:14:01.779 pictures about miseric composition.

NOTE Confidence: 0.855460437333333

00:14:01.780 --> 00:14:04.517 And we can tease out that information

NOTE Confidence: 0.855460437333333

00:14:04.517 --> 00:14:06.881 and understand what are people exposed

NOTE Confidence: 0.855460437333333

00:14:06.881 --> 00:14:09.478 to in places that have no monitors.

NOTE Confidence: 0.855460437333333

00:14:09.480 --> 00:14:11.688 This is a map of what nitrogen dioxide

NOTE Confidence: 0.855460437333333

00:14:11.688 --> 00:14:13.660 look looks like from the Tropo ME

NOTE Confidence: 0.855460437333333

00:14:13.660 --> 00:14:15.460 sensor on the Sentinel 5P satellite

NOTE Confidence: 0.855460437333333

00:14:15.460 --> 00:14:17.390 from the European Space Agency.

NOTE Confidence: 0.855460437333333

00:14:17.390 --> 00:14:19.280 Um, this map was created by Dan

NOTE Confidence: 0.855460437333333

00:14:19.280 --> 00:14:21.501 Goldberg and you can see where N 2 is

NOTE Confidence: 0.855460437333333

00:14:21.501 --> 00:14:23.760 the highest and the fact that we have

NOTE Confidence: 0.855460437333333

00:14:23.760 --> 00:14:25.385 the full geospatial coverage here.

NOTE Confidence: 0.855460437333333

00:14:25.390 --> 00:14:27.126 So we can get beyond the monitors,

NOTE Confidence: 0.855460437333333

00:14:27.130 --> 00:14:28.792 we can get beyond the monitors

NOTE Confidence: 0.855460437333333

00:14:28.792 --> 00:14:30.524 and see what people are exposed

NOTE Confidence: 0.855460437333333

00:14:30.524 --> 00:14:31.944 to all around the world.

NOTE Confidence: 0.855460437333333

00:14:31.950 --> 00:14:33.686 So what does satellite data look like?

NOTE Confidence: 0.855460437333333

00:14:33.690 --> 00:14:36.364 Well, this is a daily snapshot of

NOTE Confidence: 0.855460437333333

00:14:36.364 --> 00:14:39.492 satellite and O2 Tropo mean No2 nitrogen

NOTE Confidence: 0.855460437333333

00:14:39.492 --> 00:14:41.442 dioxide that Dan Goldberg created.

NOTE Confidence: 0.855460437333333

00:14:41.442 --> 00:14:44.568 It's, this is now available on our website.

NOTE Confidence: 0.855460437333333

00:14:44.570 --> 00:14:45.848 You can download for every day.

NOTE Confidence: 0.855460437333333

00:14:45.850 --> 00:14:48.382 It's automatically putting up this image

NOTE Confidence: 0.855460437333333

00:14:48.382 --> 00:14:51.030 of No2 concentrations over the US and

NOTE Confidence: 0.855460437333333

00:14:51.030 --> 00:14:53.459 over different regions of the US and you

NOTE Confidence: 0.855460437333333

00:14:53.459 --> 00:14:55.755 can see there's a lot of white areas,

NOTE Confidence: 0.855460437333333

00:14:55.760 --> 00:14:56.021 right?

NOTE Confidence: 0.855460437333333

00:14:56.021 --> 00:14:57.326 These are where clouds are.

NOTE Confidence: 0.855460437333333

00:14:57.330 --> 00:14:59.248 So the satellites can't see through clouds.

NOTE Confidence: 0.855460437333333

00:14:59.250 --> 00:15:01.062 We're still limited in that way

NOTE Confidence: 0.855460437333333

00:15:01.062 --> 00:15:03.120 and there's also a lot of noise.

NOTE Confidence: 0.855460437333333

00:15:03.120 --> 00:15:05.339 This is just one snapshot per day.

NOTE Confidence: 0.855460437333333

00:15:05.340 --> 00:15:08.220 The TROPONE sensor is polar orbiting.

NOTE Confidence: 0.855460437333333

00:15:08.220 --> 00:15:09.948 That means it goes around the

NOTE Confidence: 0.855460437333333

00:15:09.948 --> 00:15:12.504 earth and it takes an image of the

NOTE Confidence: 0.855460437333333

00:15:12.504 --> 00:15:14.184 atmospheric composition at about 1:30

NOTE Confidence: 0.855460437333333

00:15:14.184 --> 00:15:16.440 PM everywhere on Earth local time.

NOTE Confidence: 0.855460437333333

00:15:16.440 --> 00:15:18.519 So just the one snapshot per day,

NOTE Confidence: 0.855460437333333

00:15:18.520 --> 00:15:20.158 and this is what it produces.

NOTE Confidence: 0.855460437333333

00:15:20.160 --> 00:15:20.838 Pretty noisy.

NOTE Confidence: 0.855460437333333

00:15:20.838 --> 00:15:22.872 But when we start to average

NOTE Confidence: 0.855460437333333

00:15:22.872 --> 00:15:24.430 over longer time periods,

NOTE Confidence: 0.855460437333333

00:15:24.430 --> 00:15:26.047 we have a lot more data and

NOTE Confidence: 0.855460437333333

00:15:26.047 --> 00:15:27.779 it starts to look more smooth.

NOTE Confidence: 0.855460437333333

00:15:27.780 --> 00:15:31.947 So this is a season of data of N2

NOTE Confidence: 0.855460437333333

00:15:31.947 --> 00:15:34.857 concentrations over the US and then

NOTE Confidence: 0.855460437333333

00:15:34.857 --> 00:15:37.365 the comparison for 2021 to 2019.

NOTE Confidence: 0.855460437333333

00:15:37.365 --> 00:15:41.030 And again you can get this on our website.

NOTE Confidence: 0.881464565333333

00:15:43.820 --> 00:15:46.164 So what we can do with the full

NOTE Confidence: 0.881464565333333

00:15:46.164 --> 00:15:47.537 geographical coverage of satellite

NOTE Confidence: 0.881464565333333

00:15:47.537 --> 00:15:49.362 data and increasingly high spatial

NOTE Confidence: 0.881464565333333

00:15:49.362 --> 00:15:51.416 resolution as well is that we can

NOTE Confidence: 0.881464565333333

00:15:51.416 --> 00:15:53.246 start to tease out what is happening

NOTE Confidence: 0.881464565333333

00:15:53.246 --> 00:15:55.576 in all urban areas globally.

NOTE Confidence: 0.881464565333333

00:15:55.580 --> 00:15:57.440 And there's about 13,000

NOTE Confidence: 0.881464565333333

00:15:57.440 --> 00:15:58.835 urban areas globally.

NOTE Confidence: 0.881464565333333

00:15:58.840 --> 00:16:01.654 So we can use that continuous spatial

NOTE Confidence: 0.881464565333333

00:16:01.654 --> 00:16:04.881 map that we get from satellite data

NOTE Confidence: 0.881464565333333

00:16:04.881 --> 00:16:07.301 and integrate and aggregate that

NOTE Confidence: 0.881464565333333

00:16:07.301 --> 00:16:10.183 up to the urban areas from Veronica

NOTE Confidence: 0.881464565333333

00:16:10.183 --> 00:16:12.298 Sutherlands and Ross Mohegan and.

NOTE Confidence: 0.881464565333333

00:16:12.300 --> 00:16:12.966 Danny Balashov,

NOTE Confidence: 0.881464565333333

00:16:12.966 --> 00:16:14.964 who have all worked with me,

NOTE Confidence: 0.881464565333333

00:16:14.970 --> 00:16:16.710 have done this for PM 2.5,

NOTE Confidence: 0.881464565333333

00:16:16.710 --> 00:16:18.650 for N2 and for ozone.

NOTE Confidence: 0.881464565333333

00:16:18.650 --> 00:16:22.060 So we now have available on a Nice

NOTE Confidence: 0.881464565333333

00:16:22.060 --> 00:16:24.210 website as well interactive website

NOTE Confidence: 0.881464565333333

00:16:24.210 --> 00:16:25.836 the the levels of these three

NOTE Confidence: 0.881464565333333

00:16:25.836 --> 00:16:27.633 pollutants as well as their trends

NOTE Confidence: 0.881464565333333

00:16:27.633 --> 00:16:29.278 overtime and their contributions to

NOTE Confidence: 0.881464565333333

00:16:29.278 --> 00:16:31.625 the burden of disease in those cities

NOTE Confidence: 0.881464565333333

00:16:31.625 --> 00:16:33.250 for all 13,000 cities globally.

NOTE Confidence: 0.881464565333333

00:16:33.250 --> 00:16:35.224 We've given the data to the health

NOTE Confidence: 0.881464565333333

00:16:35.224 --> 00:16:36.630 Effects Institute who runs the

NOTE Confidence: 0.881464565333333

00:16:36.630 --> 00:16:38.142 state of Global Air project and

NOTE Confidence: 0.881464565333333

00:16:38.142 --> 00:16:39.810 they have published this report,

NOTE Confidence: 0.881464565333333

00:16:39.810 --> 00:16:41.700 air quality and health in cities

NOTE Confidence: 0.881464565333333

00:16:41.700 --> 00:16:42.960 for the first time.

NOTE Confidence: 0.881464565333333

00:16:42.960 --> 00:16:44.958 Making the data more available for

NOTE Confidence: 0.881464565333333

00:16:44.958 --> 00:16:46.759 cities around the world to use.

NOTE Confidence: 0.881464565333333

00:16:46.760 --> 00:16:47.441 And, you know,

NOTE Confidence: 0.881464565333333

00:16:47.441 --> 00:16:48.803 I think it's important to note

NOTE Confidence: 0.881464565333333

00:16:48.803 --> 00:16:49.857 that in most of these,

NOTE Confidence: 0.881464565333333

00:16:49.860 --> 00:16:51.448 probably the vast majority

NOTE Confidence: 0.881464565333333

00:16:51.448 --> 00:16:53.036 of these 13,000 cities,

NOTE Confidence: 0.881464565333333

00:16:53.040 --> 00:16:55.038 there is no air quality monitoring.

NOTE Confidence: 0.881464565333333

00:16:55.040 --> 00:16:57.308 So this is the first time that

NOTE Confidence: 0.881464565333333

00:16:57.308 --> 00:16:59.364 there's really any estimate of the

NOTE Confidence: 0.881464565333333

00:16:59.364 --> 00:17:01.119 pollution levels in those cities.

NOTE Confidence: 0.881464565333333

00:17:01.120 --> 00:17:02.896 They're likely to be very uncertain,

NOTE Confidence: 0.881464565333333

00:17:02.900 --> 00:17:05.020 probably wrong in a lot of different ways,

NOTE Confidence: 0.881464565333333

00:17:05.020 --> 00:17:06.448 but at least it's a first,

NOTE Confidence: 0.881464565333333

00:17:06.450 --> 00:17:08.580 you know, first guess at what,

NOTE Confidence: 0.881464565333333

00:17:08.580 --> 00:17:11.037 an educated guess at what pollution levels

NOTE Confidence: 0.881464565333333

00:17:11.037 --> 00:17:13.910 are driven by the observations from these.

NOTE Confidence: 0.881464565333333

00:17:13.910 --> 00:17:15.560 The lights.

NOTE Confidence: 0.881464565333333

00:17:15.560 --> 00:17:16.772 The other thing we can do

NOTE Confidence: 0.881464565333333

00:17:16.772 --> 00:17:17.580 with the satellite data,

NOTE Confidence: 0.881464565333333

00:17:17.580 --> 00:17:19.048 with the continuous coverage,

NOTE Confidence: 0.881464565333333

00:17:19.048 --> 00:17:20.149 the continuous geospatial

NOTE Confidence: 0.881464565333333

00:17:20.149 --> 00:17:22.059 coverage from the satellite data,

NOTE Confidence: 0.881464565333333

00:17:22.060 --> 00:17:24.196 is that we can get at what is

NOTE Confidence: 0.881464565333333

00:17:24.196 --> 00:17:25.839 happening within individual cities.

NOTE Confidence: 0.881464565333333

00:17:25.840 --> 00:17:26.538 And again,

NOTE Confidence: 0.881464565333333

00:17:26.538 --> 00:17:28.632 we know that cities are experiencing

NOTE Confidence: 0.881464565333333

00:17:28.632 --> 00:17:29.760 health inequality issues.

NOTE Confidence: 0.881464565333333

00:17:29.760 --> 00:17:31.884 There's a long history of science

NOTE Confidence: 0.881464565333333

00:17:31.884 --> 00:17:33.873 telling us that air pollution

NOTE Confidence: 0.881464565333333

00:17:33.873 --> 00:17:35.865 levels are inequitably distributed

NOTE Confidence: 0.881464565333333

00:17:35.865 --> 00:17:37.857 within cities as well.

NOTE Confidence: 0.881464565333333

00:17:37.860 --> 00:17:38.284 But again,

NOTE Confidence: 0.881464565333333

00:17:38.284 --> 00:17:39.556 we can't get that just from

NOTE Confidence: 0.881464565333333

00:17:39.556 --> 00:17:41.007 the four or five monitors that

NOTE Confidence: 0.881464565333333

00:17:41.007 --> 00:17:42.232 we have in individual city.

NOTE Confidence: 0.881464565333333

00:17:42.240 --> 00:17:44.220 So we need to use the,

NOTE Confidence: 0.881464565333333

00:17:44.220 --> 00:17:44.886 you know,

NOTE Confidence: 0.881464565333333

00:17:44.886 --> 00:17:46.884 we need to use approaches for

NOTE Confidence: 0.881464565333333

00:17:46.884 --> 00:17:48.412 estimating pollution levels between

NOTE Confidence: 0.881464565333333

00:17:48.412 --> 00:17:50.012 those monitors to understand

NOTE Confidence: 0.881464565333333

00:17:50.012 --> 00:17:52.060 inequality and air pollution levels.

NOTE Confidence: 0.881464565333333

00:17:52.060 --> 00:17:54.778 So this is a study led by Maria Castillo,

NOTE Confidence: 0.881464565333333

00:17:54.780 --> 00:17:58.036 who's now an urban planning student at MIT.

NOTE Confidence: 0.881464565333333

00:17:58.040 --> 00:18:00.165 And we partnered with the

NOTE Confidence: 0.881464565333333

00:18:00.165 --> 00:18:01.440 DC local government,

NOTE Confidence: 0.881464565333333

00:18:01.440 --> 00:18:03.477 the DC Department of Energy and Environment

NOTE Confidence: 0.881464565333333

00:18:03.477 --> 00:18:05.210 and the Office of HealthEquity,

NOTE Confidence: 0.881464565333333

00:18:05.210 --> 00:18:07.126 who had they had.

NOTE Confidence: 0.881464565333333

00:18:07.126 --> 00:18:09.042 Settlement funds from the

NOTE Confidence: 0.881464565333333

00:18:09.042 --> 00:18:11.109 Volkswagen Diesel gate scandal.

NOTE Confidence: 0.881464565333333

00:18:11.110 --> 00:18:13.820 Anyone remember in 2015 there

NOTE Confidence: 0.881464565333333

00:18:13.820 --> 00:18:16.530 was a big revolution that.

NOTE Confidence: 0.881464565333333

00:18:16.530 --> 00:18:18.098 Volkswagen vehicles were equipped

NOTE Confidence: 0.881464565333333

00:18:18.098 --> 00:18:19.666 with these defeat devices,

NOTE Confidence: 0.881464565333333

00:18:19.670 --> 00:18:21.902 pieces of software that would turn

NOTE Confidence: 0.881464565333333

00:18:21.902 --> 00:18:23.827 the emission control equipment on

NOTE Confidence: 0.881464565333333

00:18:23.827 --> 00:18:25.712 when the vehicle was undergoing

NOTE Confidence: 0.881464565333333

00:18:25.712 --> 00:18:27.573 regulatory testing of emissions and

NOTE Confidence: 0.881464565333333

00:18:27.573 --> 00:18:29.575 then off when they were being driven

NOTE Confidence: 0.881464565333333

00:18:29.575 --> 00:18:31.686 around in real world driving conditions.

NOTE Confidence: 0.881464565333333

00:18:31.686 --> 00:18:33.990 And that was leading to substantially

NOTE Confidence: 0.881464565333333

00:18:34.054 --> 00:18:35.779 higher orders of magnitude higher

NOTE Confidence: 0.881464565333333

00:18:35.779 --> 00:18:37.504 NOx emissions in real world

NOTE Confidence: 0.881464565333333

00:18:37.561 --> 00:18:39.557 driving conditions than during

NOTE Confidence: 0.881464565333333

00:18:39.557 --> 00:18:40.555 certification testing.

NOTE Confidence: 0.695259452

00:18:40.560 --> 00:18:41.610 So there's a big lawsuit,

NOTE Confidence: 0.695259452

00:18:41.610 --> 00:18:44.552 people went to jail and now cities

NOTE Confidence: 0.695259452

00:18:44.552 --> 00:18:46.707 have access to settlement funds.

NOTE Confidence: 0.695259452

00:18:46.710 --> 00:18:48.336 They can use to direct resources

NOTE Confidence: 0.695259452

00:18:48.336 --> 00:18:49.420 to improve air quality.

NOTE Confidence: 0.695259452

00:18:49.420 --> 00:18:51.004 So the DC government had settlement

NOTE Confidence: 0.695259452

00:18:51.004 --> 00:18:53.077 funds and they came to us and they said,

NOTE Confidence: 0.695259452

00:18:53.080 --> 00:18:55.145 can you help us understand how air

NOTE Confidence: 0.695259452

00:18:55.145 --> 00:18:56.854 pollution is contributing to the health

NOTE Confidence: 0.695259452

00:18:56.854 --> 00:18:58.390 inequality problem in the city so

NOTE Confidence: 0.695259452

00:18:58.390 --> 00:19:00.490 that we might be able to direct these

NOTE Confidence: 0.695259452

00:19:00.490 --> 00:19:02.829 resources to places that are overburdened?

NOTE Confidence: 0.695259452

00:19:02.829 --> 00:19:05.519 So we estimated PM 2.5 attributable

NOTE Confidence: 0.695259452

00:19:05.519 --> 00:19:07.757 mortality using one of those continuous

NOTE Confidence: 0.695259452

00:19:07.757 --> 00:19:10.143 data sets of PM 2.5 in this case from

NOTE Confidence: 0.695259452

00:19:10.143 --> 00:19:13.160 the Washu group led by Randall Martin.

NOTE Confidence: 0.695259452

00:19:13.160 --> 00:19:16.728 And we estimated PM 2.5 mortality rates and.

NOTE Confidence: 0.695259452

00:19:16.730 --> 00:19:18.662 We saw that the highest PM 2.5

NOTE Confidence: 0.695259452

00:19:18.662 --> 00:19:20.001 mortality rates occurred in the

NOTE Confidence: 0.695259452

00:19:20.001 --> 00:19:21.146 eastern half of the city,

NOTE Confidence: 0.695259452

00:19:21.150 --> 00:19:22.836 and lower PM 2.5 mortality rates

NOTE Confidence: 0.695259452

00:19:22.836 --> 00:19:24.668 in the western half of the city.

NOTE Confidence: 0.695259452

00:19:24.670 --> 00:19:26.116 And this lined up almost exactly

NOTE Confidence: 0.695259452

00:19:26.116 --> 00:19:28.090 with the map of racial segregation,

NOTE Confidence: 0.695259452

00:19:28.090 --> 00:19:29.286 segregation in the city,

NOTE Confidence: 0.695259452

00:19:29.286 --> 00:19:31.474 so the eastern half of the cities

NOTE Confidence: 0.695259452

00:19:31.474 --> 00:19:33.144 primarily black and the western

NOTE Confidence: 0.695259452

00:19:33.144 --> 00:19:35.480 half of the cities primarily white.

NOTE Confidence: 0.695259452

00:19:35.480 --> 00:19:36.296 I know what that noise is.

NOTE Confidence: 0.841432425666666

00:19:38.680 --> 00:19:40.805 This research was received some

NOTE Confidence: 0.841432425666666

00:19:40.805 --> 00:19:43.389 interest from NASA and they created

NOTE Confidence: 0.841432425666666

00:19:43.389 --> 00:19:45.681 this really nice looking map and

NOTE Confidence: 0.841432425666666

00:19:45.681 --> 00:19:48.737 they made it the image of the day

NOTE Confidence: 0.841432425666666

00:19:48.737 --> 00:19:50.572 on the NASA Earth Observatory,

NOTE Confidence: 0.841432425666666

00:19:50.580 --> 00:19:51.896 which was really cool.

NOTE Confidence: 0.841432425666666

00:19:51.896 --> 00:19:53.870 And because so many people follow

NOTE Confidence: 0.841432425666666

00:19:53.932 --> 00:19:56.004 the NASA Earth Observatory, if you

NOTE Confidence: 0.841432425666666

00:19:56.004 --> 00:19:57.940 don't you should on Instagram or you know,

NOTE Confidence: 0.841432425666666

00:19:57.940 --> 00:20:00.340 whatever your social media choices.

NOTE Confidence: 0.841432425666666

00:20:00.340 --> 00:20:02.860 They posted it there and it got picked up

NOTE Confidence: 0.841432425666666

00:20:02.860 --> 00:20:05.699 by another influential Instagram accounts.

NOTE Confidence: 0.841432425666666

00:20:05.700 --> 00:20:06.654 Washingtonian probs.

NOTE Confidence: 0.841432425666666

00:20:06.654 --> 00:20:09.993 Which has hundreds of thousands of followers.

NOTE Confidence: 0.841432425666666

00:20:10.000 --> 00:20:12.275 So this was a way that our,

NOTE Confidence: 0.841432425666666

00:20:12.280 --> 00:20:15.928 you know study which was published in an

NOTE Confidence: 0.841432425666666

00:20:15.928 --> 00:20:18.368 esoteric journal Geo Health was picked

NOTE Confidence: 0.841432425666666

00:20:18.368 --> 00:20:20.636 up and brought to people who wouldn't

NOTE Confidence: 0.841432425666666

00:20:20.636 --> 00:20:22.500 normally read papers of Geo Health.

NOTE Confidence: 0.841432425666666

00:20:22.500 --> 00:20:23.580 And I know they tell you,

NOTE Confidence: 0.841432425666666

00:20:23.580 --> 00:20:25.410 you never read the social media

NOTE Confidence: 0.841432425666666

00:20:25.410 --> 00:20:27.239 comments about you know your work.

NOTE Confidence: 0.841432425666666

00:20:27.240 --> 00:20:28.920 But you know in a lapse of judgment

NOTE Confidence: 0.841432425666666

00:20:28.920 --> 00:20:30.656 one day I decided to read those

NOTE Confidence: 0.841432425666666

00:20:30.656 --> 00:20:32.480 comments and anyone want to take a

NOTE Confidence: 0.841432425666666

00:20:32.480 --> 00:20:34.199 guess at the most frequent comment

NOTE Confidence: 0.841432425666666

00:20:34.199 --> 00:20:35.909 of the Washingtonian probs account

NOTE Confidence: 0.841432425666666

00:20:35.909 --> 00:20:39.100 got when they when they posted?

NOTE Confidence: 0.841432425666666

00:20:39.100 --> 00:20:40.920 Yes. Thank you for your work.

NOTE Confidence: 0.7745962025

00:20:42.950 --> 00:20:43.818 That would be nice.

NOTE Confidence: 0.823416

00:20:46.260 --> 00:20:49.500 The most frequent comment was done.

NOTE Confidence: 0.823416

00:20:49.500 --> 00:20:51.620 So you know, I think people know this,

NOTE Confidence: 0.823416

00:20:51.620 --> 00:20:53.305 people know that air pollution

NOTE Confidence: 0.823416

00:20:53.305 --> 00:20:54.316 is inequitably distributed.

NOTE Confidence: 0.823416

00:20:54.320 --> 00:20:55.545 But again, if you don't

NOTE Confidence: 0.823416

00:20:55.545 --> 00:20:57.100 show it with data and maps,

NOTE Confidence: 0.823416

00:20:57.100 --> 00:20:59.680 then it's difficult to address.

NOTE Confidence: 0.823416

00:20:59.680 --> 00:21:01.325 In this case, again, we work directly

NOTE Confidence: 0.823416

00:21:01.325 --> 00:21:02.899 with the DC local government.

NOTE Confidence: 0.823416

00:21:02.900 --> 00:21:04.898 So it was a way that they were able

NOTE Confidence: 0.823416

00:21:04.898 --> 00:21:07.311 to help us design the study to answer

NOTE Confidence: 0.823416

00:21:07.311 --> 00:21:09.363 the question that they had and then

NOTE Confidence: 0.823416

00:21:09.363 --> 00:21:11.410 they can use the results to, you know,

NOTE Confidence: 0.823416

00:21:11.410 --> 00:21:12.700 to determine how they're using those,

NOTE Confidence: 0.823416

00:21:12.700 --> 00:21:14.089 those settlement funds.

NOTE Confidence: 0.823416

00:21:14.089 --> 00:21:16.867 Fun Facts on Friday I just

NOTE Confidence: 0.823416

00:21:16.867 --> 00:21:19.073 recorded a video at NASA studio,

NOTE Confidence: 0.823416

00:21:19.073 --> 00:21:21.488 NASA Goddard Space Flight Center.

NOTE Confidence: 0.823416

00:21:21.490 --> 00:21:23.533 They are going to now have it now and

NOTE Confidence: 0.823416

00:21:23.533 --> 00:21:25.770 then that the lobby of NASA headquarters,

NOTE Confidence: 0.823416

00:21:25.770 --> 00:21:28.170 a giant screen with me talking

NOTE Confidence: 0.823416

00:21:28.170 --> 00:21:29.370 about this study.

NOTE Confidence: 0.823416

00:21:29.370 --> 00:21:31.590 And they did not tell me my face was going

NOTE Confidence: 0.823416

00:21:31.650 --> 00:21:33.770 to be up there at the size of my course.

NOTE Confidence: 0.823416

00:21:33.770 --> 00:21:35.090 So I'm not excited about that.

NOTE Confidence: 0.823416

00:21:35.090 --> 00:21:37.508 But I'm excited that they are,

NOTE Confidence: 0.823416

00:21:37.510 --> 00:21:39.135 that they're highlighting this important

NOTE Confidence: 0.823416

00:21:39.135 --> 00:21:41.278 work because I really think it does

NOTE Confidence: 0.823416

00:21:41.278 --> 00:21:42.916 show the value of satellite data and

NOTE Confidence: 0.823416

00:21:42.916 --> 00:21:45.319 what it can tell us in terms of.

NOTE Confidence: 0.823416

00:21:45.319 --> 00:21:47.251 Real world's problems that

NOTE Confidence: 0.823416

00:21:47.251 --> 00:21:49.340 we're experiencing in cities.

NOTE Confidence: 0.823416

00:21:49.340 --> 00:21:52.190 So that was PM 2.5 and CO2 is a pollutant

NOTE Confidence: 0.823416

00:21:52.266 --> 00:21:55.396 that a lot of us don't think that much about.

NOTE Confidence: 0.823416

00:21:55.400 --> 00:21:57.476 We often think about PM 2.5.

NOTE Confidence: 0.823416

00:21:57.480 --> 00:21:59.304 That's the largest contributor to the

NOTE Confidence: 0.823416

00:21:59.304 --> 00:22:01.279 burden of disease from air pollution,

NOTE Confidence: 0.823416

00:22:01.280 --> 00:22:02.774 followed by ozone.

NOTE Confidence: 0.823416

00:22:02.774 --> 00:22:06.260 And O2 is a precursor to both

NOTE Confidence: 0.823416

00:22:06.260 --> 00:22:06.916 PM 2.5 and ozone.

NOTE Confidence: 0.823416

00:22:06.916 --> 00:22:08.610 So if we want to address those pollutants,

NOTE Confidence: 0.823416

00:22:08.610 --> 00:22:10.680 we have to know where the

NOTE Confidence: 0.823416

00:22:10.680 --> 00:22:13.100 No2 is and and control it.

NOTE Confidence: 0.823416

00:22:13.100 --> 00:22:16.356 It's also a high resolution tracer for urban

NOTE Confidence: 0.823416

00:22:16.356 --> 00:22:19.770 traffic in particular it's associated itself.

NOTE Confidence: 0.823416

00:22:19.770 --> 00:22:20.745 With asthma development,

NOTE Confidence: 0.823416

00:22:20.745 --> 00:22:22.370 that's just not that's not

NOTE Confidence: 0.823416

00:22:22.370 --> 00:22:23.750 just asthma exacerbation,

NOTE Confidence: 0.823416

00:22:23.750 --> 00:22:27.145 but new development of asthma among children.

NOTE Confidence: 0.823416

00:22:27.150 --> 00:22:30.146 And very conveniently it is highly correlated

NOTE Confidence: 0.823416

00:22:30.146 --> 00:22:32.789 satellite and O2 is highly correlated

NOTE Confidence: 0.823416

00:22:32.789 --> 00:22:35.363 with ground level O2 from monitors.

NOTE Confidence: 0.823416

00:22:35.370 --> 00:22:36.010 So this,

NOTE Confidence: 0.823416

00:22:36.010 --> 00:22:36.650 for example,

NOTE Confidence: 0.823416

00:22:36.650 --> 00:22:38.990 is a scatter plot created by my

NOTE Confidence: 0.823416

00:22:38.990 --> 00:22:41.102 colleague Dan Goldberg and Gage Kerr

NOTE Confidence: 0.823416

00:22:41.102 --> 00:22:43.698 who showed that trouble me No2 columns.

NOTE Confidence: 0.823416

00:22:43.700 --> 00:22:45.352 That's the amount of N2 in the

NOTE Confidence: 0.823416

00:22:45.352 --> 00:22:47.026 column of air between the satellite

NOTE Confidence: 0.823416

00:22:47.026 --> 00:22:48.850 and the surface of the Earth.

NOTE Confidence: 0.823416

00:22:48.850 --> 00:22:51.188 Is highly correlated to N2 at the

NOTE Confidence: 0.823416

00:22:51.188 --> 00:22:53.377 ground level monitor monitored by our

NOTE Confidence: 0.823416

00:22:53.377 --> 00:22:55.609 AQS monitor monitors our air quality

NOTE Confidence: 0.823416

00:22:55.609 --> 00:22:58.163 system monitors and so this makes it

NOTE Confidence: 0.823416

00:22:58.163 --> 00:23:00.222 a very convenient pollutant to study.

NOTE Confidence: 0.823416

00:23:00.222 --> 00:23:01.506 Whereas for PM 2.5,

NOTE Confidence: 0.823416

00:23:01.510 --> 00:23:02.846 the satellites are monitoring

NOTE Confidence: 0.823416

00:23:02.846 --> 00:23:03.848 at different quantity,

NOTE Confidence: 0.823416

00:23:03.850 --> 00:23:05.404 aerosol optical depth and then we need

NOTE Confidence: 0.823416

00:23:05.404 --> 00:23:07.416 to do a bunch of science to convert

NOTE Confidence: 0.823416

00:23:07.416 --> 00:23:09.224 that to ground level PM 2.5 here,

NOTE Confidence: 0.823416

00:23:09.224 --> 00:23:11.030 even if we just took the Tropo

NOTE Confidence: 0.823416

00:23:11.090 --> 00:23:12.110 Vienna 2 columns,

NOTE Confidence: 0.823416

00:23:12.110 --> 00:23:14.476 we have a pretty good sense for

NOTE Confidence: 0.823416

00:23:14.476 --> 00:23:16.857 where where the ground level 2 is.

NOTE Confidence: 0.823416

00:23:16.860 --> 00:23:20.060 So around the time that the pandemic hit,

NOTE Confidence: 0.823416

00:23:20.060 --> 00:23:22.440 we had just hired Dr.

NOTE Confidence: 0.823416

00:23:22.440 --> 00:23:25.618 Gage Kerr as a postdoc and we

NOTE Confidence: 0.823416

00:23:25.618 --> 00:23:28.376 were wondering whether or not we

NOTE Confidence: 0.823416

00:23:28.376 --> 00:23:30.556 could use these troponin data.

NOTE Confidence: 0.823416

00:23:30.560 --> 00:23:32.930 So troponin data started that

NOTE Confidence: 0.823416

00:23:32.930 --> 00:23:35.300 the records started in 2018,

NOTE Confidence: 0.823416

00:23:35.300 --> 00:23:36.660 so it was very new.

NOTE Confidence: 0.856515851

00:23:36.660 --> 00:23:38.750 And you know, when the

NOTE Confidence: 0.856515851

00:23:38.750 --> 00:23:40.840 pandemic hit in spring 2020,

NOTE Confidence: 0.856515851

00:23:40.840 --> 00:23:42.628 Dan Goldberg had been going through

NOTE Confidence: 0.856515851

00:23:42.628 --> 00:23:44.436 these energy readings and looking at

NOTE Confidence: 0.856515851

00:23:44.436 --> 00:23:46.417 different urban areas and seeing how the

NOTE Confidence: 0.856515851

00:23:46.417 --> 00:23:48.169 trends differed in different cities.

NOTE Confidence: 0.856515851

00:23:48.170 --> 00:23:49.230 And we wondered, you know,

NOTE Confidence: 0.856515851

00:23:49.230 --> 00:23:52.078 could we use this data set to explore

NOTE Confidence: 0.856515851

00:23:52.078 --> 00:23:55.089 how No2 changed during the pandemic?

NOTE Confidence: 0.856515851

00:23:55.090 --> 00:23:56.962 There are a lot of people working on air

NOTE Confidence: 0.856515851

00:23:56.962 --> 00:23:58.427 quality changes during the pandemic.

NOTE Confidence: 0.856515851

00:23:58.430 --> 00:23:59.122 Of course,

NOTE Confidence: 0.856515851

00:23:59.122 --> 00:24:01.198 there's a whole community of people.

NOTE Confidence: 0.856515851

00:24:01.200 --> 00:24:02.610 We actually got on the phone

NOTE Confidence: 0.856515851

00:24:02.610 --> 00:24:04.221 once a month talking about air

NOTE Confidence: 0.856515851

00:24:04.221 --> 00:24:05.465 quality changes during COVID.

NOTE Confidence: 0.856515851

00:24:05.470 --> 00:24:07.350 But we wanted to take this a step

NOTE Confidence: 0.856515851

00:24:07.350 --> 00:24:08.771 further and really leverage the

NOTE Confidence: 0.856515851

00:24:08.771 --> 00:24:10.559 value of the satellite data with

NOTE Confidence: 0.856515851

00:24:10.559 --> 00:24:12.430 that complete geospatial coverage.

NOTE Confidence: 0.856515851

00:24:12.430 --> 00:24:13.888 And one of the, you know,

NOTE Confidence: 0.856515851

00:24:13.890 --> 00:24:15.528 values of that satellite data is the

NOTE Confidence: 0.856515851

00:24:15.528 --> 00:24:17.387 fact that we can look within cities,

NOTE Confidence: 0.856515851

00:24:17.390 --> 00:24:18.382 different subpopulations.

NOTE Confidence: 0.856515851

00:24:18.382 --> 00:24:19.870 Living within cities.

NOTE Confidence: 0.856515851

00:24:19.870 --> 00:24:22.003 So we had no idea whether we could use

NOTE Confidence: 0.856515851

00:24:22.003 --> 00:24:24.067 this data set to explore disparities.

NOTE Confidence: 0.856515851

00:24:24.070 --> 00:24:26.010 And I know two concentrations,

NOTE Confidence: 0.856515851

00:24:26.010 --> 00:24:26.938 but we we thought,

NOTE Confidence: 0.856515851

00:24:26.938 --> 00:24:29.524 let's just give it a shot, see what happens.

NOTE Confidence: 0.856515851

00:24:29.524 --> 00:24:31.514 Probably we won't see anything.

NOTE Confidence: 0.856515851

00:24:31.520 --> 00:24:31.765 Well,

NOTE Confidence: 0.856515851

00:24:31.765 --> 00:24:33.235 it turned out we did see

NOTE Confidence: 0.856515851

00:24:33.235 --> 00:24:34.600 something and it was really,

NOTE Confidence: 0.856515851

00:24:34.600 --> 00:24:36.256 really striking to me.

NOTE Confidence: 0.856515851

00:24:36.256 --> 00:24:39.240 So prior to the pandemic in 2019,

NOTE Confidence: 0.856515851

00:24:39.240 --> 00:24:40.980 the least white census tracts

NOTE Confidence: 0.856515851

00:24:40.980 --> 00:24:43.182 across the United States had no

NOTE Confidence: 0.856515851

00:24:43.182 --> 00:24:44.790 two concentrations that were

NOTE Confidence: 0.856515851

00:24:44.790 --> 00:24:46.398 about double the concentrations

NOTE Confidence: 0.856515851

00:24:46.398 --> 00:24:48.540 and the most white census tract.

NOTE Confidence: 0.856515851

00:24:48.540 --> 00:24:52.476 Again, that's prior to the pandemic.

NOTE Confidence: 0.856515851

00:24:52.480 --> 00:24:54.270 During the lockdowns in 2020,

NOTE Confidence: 0.856515851

00:24:54.270 --> 00:24:56.016 both the orange dots and the

NOTE Confidence: 0.856515851

00:24:56.016 --> 00:24:57.180 blue dots shifted left,

NOTE Confidence: 0.856515851

00:24:57.180 --> 00:24:59.022 and that indicates that No2 dropped

NOTE Confidence: 0.856515851

00:24:59.022 --> 00:25:01.309 for both the least white census tracts

NOTE Confidence: 0.856515851

00:25:01.309 --> 00:25:03.313 and the most white census tracts.

NOTE Confidence: 0.856515851

00:25:03.320 --> 00:25:03.896 Just good thing,

NOTE Confidence: 0.856515851

00:25:03.896 --> 00:25:04.280 you know,

NOTE Confidence: 0.856515851

00:25:04.280 --> 00:25:06.332 we had about 50% fewer passenger

NOTE Confidence: 0.856515851

00:25:06.332 --> 00:25:07.700 vehicles on the road.

NOTE Confidence: 0.856515851

00:25:07.700 --> 00:25:09.583 It's a good thing that we can

NOTE Confidence: 0.856515851

00:25:09.583 --> 00:25:11.370 observe and O2 just by itself.

NOTE Confidence: 0.856515851

00:25:11.370 --> 00:25:13.750 That was useful to know that we

NOTE Confidence: 0.856515851

00:25:13.750 --> 00:25:15.852 could use this tromi data set

NOTE Confidence: 0.856515851

00:25:15.852 --> 00:25:18.183 to observe that drop in and O2

NOTE Confidence: 0.856515851

00:25:18.262 --> 00:25:20.558 during this natural experiment.

NOTE Confidence: 0.856515851

00:25:20.560 --> 00:25:20.925 But.

NOTE Confidence: 0.856515851

00:25:20.925 --> 00:25:23.115 One thing that we found that

NOTE Confidence: 0.856515851

00:25:23.115 --> 00:25:25.057 was really concerning was that

NOTE Confidence: 0.856515851

00:25:25.057 --> 00:25:26.605 during the 2020 lockdowns,

NOTE Confidence: 0.856515851

00:25:26.610 --> 00:25:28.350 then O2 concentrations in the

NOTE Confidence: 0.856515851

00:25:28.350 --> 00:25:30.090 least white Census tracts were

NOTE Confidence: 0.856515851

00:25:30.158 --> 00:25:32.260 still about 50% higher than the

NOTE Confidence: 0.856515851

00:25:32.260 --> 00:25:34.310 concentrations and the most white

NOTE Confidence: 0.856515851

00:25:34.310 --> 00:25:36.629 census tracts prior to the pandemic.

NOTE Confidence: 0.856515851

00:25:36.630 --> 00:25:38.655 And this indicates that the

NOTE Confidence: 0.856515851

00:25:38.655 --> 00:25:40.275 disparities in antipollution were

NOTE Confidence: 0.856515851

00:25:40.275 --> 00:25:42.607 so large prior to the pandemic that

NOTE Confidence: 0.856515851

00:25:42.607 --> 00:25:44.924 even about a 50% drop in passenger

NOTE Confidence: 0.856515851

00:25:44.924 --> 00:25:46.714 vehicle traffic was not enough

NOTE Confidence: 0.856515851

00:25:46.714 --> 00:25:48.550 to eliminate those disparities.

NOTE Confidence: 0.856515851

00:25:48.550 --> 00:25:49.603 And that held,

NOTE Confidence: 0.856515851

00:25:49.603 --> 00:25:51.709 that pattern held for nearly all

NOTE Confidence: 0.856515851

00:25:51.709 --> 00:25:54.552 major cities across the US and also

NOTE Confidence: 0.856515851

00:25:54.552 --> 00:25:56.168 held for educational attainment

NOTE Confidence: 0.856515851

00:25:56.236 --> 00:25:57.229 and for income.

NOTE Confidence: 0.856515851

00:25:57.230 --> 00:25:58.064 But really,

NOTE Confidence: 0.856515851

00:25:58.064 --> 00:26:00.566 that only tells us about exposure.

NOTE Confidence: 0.856515851

00:26:00.570 --> 00:26:02.158 We're really just concentrations,

NOTE Confidence: 0.856515851

00:26:02.158 --> 00:26:03.349 not even exposure.

NOTE Confidence: 0.856515851

00:26:03.350 --> 00:26:05.420 It doesn't tell us about the

NOTE Confidence: 0.856515851

00:26:05.420 --> 00:26:06.800 susceptibility of the population.

NOTE Confidence: 0.856515851

00:26:06.800 --> 00:26:08.870 That is breathing those concentrations.

NOTE Confidence: 0.856515851

00:26:08.870 --> 00:26:11.782 So Gage took this a step further

NOTE Confidence: 0.856515851

00:26:11.782 --> 00:26:14.802 and looked at both PNC .5 and N2,

NOTE Confidence: 0.856515851

00:26:14.802 --> 00:26:16.442 and not just the concentrations,

NOTE Confidence: 0.856515851

00:26:16.450 --> 00:26:18.718 but the health outcomes that are

NOTE Confidence: 0.856515851

00:26:18.718 --> 00:26:20.230 associated with those concentrations.

NOTE Confidence: 0.856515851

00:26:20.230 --> 00:26:23.074 So he's comparing PM 2.5 attributable

NOTE Confidence: 0.856515851

00:26:23.074 --> 00:26:25.586 mortality per 100,000 people and

NOTE Confidence: 0.856515851

00:26:25.586 --> 00:26:27.758 that NATO attributable pediatric

NOTE Confidence: 0.856515851

00:26:27.758 --> 00:26:29.966 asthma incidence rate as well.

NOTE Confidence: 0.856515851

00:26:29.966 --> 00:26:31.826 And let's just look at

NOTE Confidence: 0.855744011666667

00:26:31.830 --> 00:26:34.174 PM 2.5 first. We see that PM 2.5

NOTE Confidence: 0.855744011666667

00:26:34.174 --> 00:26:35.926 concentrations are dropping over time for

NOTE Confidence: 0.855744011666667

00:26:35.926 --> 00:26:38.248 both the most white and the least white

NOTE Confidence: 0.855744011666667

00:26:38.248 --> 00:26:40.150 census tracks across the United States.

NOTE Confidence: 0.855744011666667

00:26:40.150 --> 00:26:41.518 This is very similar to the graph I

NOTE Confidence: 0.855744011666667

00:26:41.518 --> 00:26:42.855 showed you at the beginning, showing

NOTE Confidence: 0.855744011666667

00:26:42.855 --> 00:26:44.805 that PM concentrations are going down,

NOTE Confidence: 0.855744011666667

00:26:44.810 --> 00:26:46.916 starting to stagnate a little bit

NOTE Confidence: 0.855744011666667

00:26:46.916 --> 00:26:48.969 due to those Western US fires.

NOTE Confidence: 0.855744011666667

00:26:48.970 --> 00:26:50.398 But the disparities persist,

NOTE Confidence: 0.855744011666667

00:26:50.398 --> 00:26:52.183 as many others have found

NOTE Confidence: 0.855744011666667

00:26:52.183 --> 00:26:54.048 in the literature as well,

NOTE Confidence: 0.855744011666667

00:26:54.050 --> 00:26:56.340 that PM 2.5 concentrations and

NOTE Confidence: 0.855744011666667

00:26:56.340 --> 00:26:58.630 associated disease burdens are higher

NOTE Confidence: 0.855744011666667

00:26:58.702 --> 00:27:00.688 for the least weight census tracts,

NOTE Confidence: 0.855744011666667

00:27:00.688 --> 00:27:02.602 and then they are for the

NOTE Confidence: 0.855744011666667

00:27:02.602 --> 00:27:04.190 most white census tracts.

NOTE Confidence: 0.855744011666667

00:27:04.190 --> 00:27:05.586 And the relative disparity,

NOTE Confidence: 0.855744011666667

00:27:05.586 --> 00:27:07.331 the relative ratio between blue

NOTE Confidence: 0.855744011666667

00:27:07.331 --> 00:27:09.108 dots and the orange dots here,

NOTE Confidence: 0.855744011666667

00:27:09.110 --> 00:27:10.650 is actually rising over time.

NOTE Confidence: 0.855744011666667

00:27:10.650 --> 00:27:12.744 So the relative disparity is getting

NOTE Confidence: 0.855744011666667

00:27:12.744 --> 00:27:15.418 worse even though the levels are coming

NOTE Confidence: 0.855744011666667

00:27:15.418 --> 00:27:17.448 down for both populations subgroups.

NOTE Confidence: 0.855744011666667

00:27:17.450 --> 00:27:17.986 For No2,

NOTE Confidence: 0.855744011666667

00:27:17.986 --> 00:27:20.130 on the right hand side here we see

NOTE Confidence: 0.855744011666667

00:27:20.192 --> 00:27:22.677 that no two and its associated impact

NOTE Confidence: 0.855744011666667

00:27:22.677 --> 00:27:24.590 on asthma incidents among children

NOTE Confidence: 0.855744011666667

00:27:24.590 --> 00:27:26.545 is also decreasing over time,

NOTE Confidence: 0.855744011666667

00:27:26.550 --> 00:27:28.130 again to very successful

NOTE Confidence: 0.855744011666667

00:27:28.130 --> 00:27:30.105 regulations under Clean Air Act.

NOTE Confidence: 0.855744011666667

00:27:30.110 --> 00:27:31.570 But the disparity is much,

NOTE Confidence: 0.855744011666667

00:27:31.570 --> 00:27:33.998 much larger than it is for PM 2.5.

NOTE Confidence: 0.855744011666667

00:27:33.998 --> 00:27:34.566 In fact,

NOTE Confidence: 0.855744011666667

00:27:34.566 --> 00:27:36.690 the relative disparity is about 7 1/2,

NOTE Confidence: 0.855744011666667

00:27:36.690 --> 00:27:38.790 meaning that the most the least

NOTE Confidence: 0.855744011666667

00:27:38.790 --> 00:27:40.637 white census tracts have values

NOTE Confidence: 0.855744011666667

00:27:40.637 --> 00:27:43.136 that are about 7 1/2 times larger

NOTE Confidence: 0.855744011666667

00:27:43.212 --> 00:27:45.546 than the most white census tracts,

NOTE Confidence: 0.855744011666667

00:27:45.550 --> 00:27:47.685 whereas that value is only 1.3.

NOTE Confidence: 0.855744011666667

00:27:47.685 --> 00:27:51.336 For PM 2.5 not to diminish 1.3,

NOTE Confidence: 0.855744011666667

00:27:51.336 --> 00:27:52.916 that's still 30% larger PM

NOTE Confidence: 0.855744011666667

00:27:52.916 --> 00:27:54.567 mortality impacts for the least

NOTE Confidence: 0.855744011666667

00:27:54.567 --> 00:27:56.202 white Census tracts compared to

NOTE Confidence: 0.855744011666667

00:27:56.202 --> 00:27:57.960 the most white census tracts,

NOTE Confidence: 0.855744011666667

00:27:57.960 --> 00:28:00.780 but no two exhibits far greater

NOTE Confidence: 0.855744011666667

00:28:00.780 --> 00:28:04.048 disparity than PM 2.5 does.

NOTE Confidence: 0.855744011666667

00:28:04.050 --> 00:28:04.385 Now,

NOTE Confidence: 0.855744011666667

00:28:04.385 --> 00:28:06.730 all all of this that I've just

NOTE Confidence: 0.855744011666667

00:28:06.730 --> 00:28:09.711 showed you is based on one expose 1

NOTE Confidence: 0.855744011666667

00:28:09.711 --> 00:28:11.930 concentration data set per analysis.

NOTE Confidence: 0.855744011666667

00:28:11.930 --> 00:28:13.532 And there's a lot of people working on a

NOTE Confidence: 0.855744011666667

00:28:13.532 --> 00:28:15.247 lot of different concentration data sets,

NOTE Confidence: 0.855744011666667

00:28:15.250 --> 00:28:17.410 both PMC .5 and No2,

NOTE Confidence: 0.855744011666667

00:28:17.410 --> 00:28:19.327 and we don't know which one is the best.

NOTE Confidence: 0.855744011666667

00:28:19.330 --> 00:28:20.590 People are using different methods,

NOTE Confidence: 0.855744011666667

00:28:20.590 --> 00:28:22.206 they're using different approaches,

NOTE Confidence: 0.855744011666667

00:28:22.206 --> 00:28:23.418 different data inputs.

NOTE Confidence: 0.855744011666667

00:28:23.420 --> 00:28:25.148 And so we wanted to know how much

NOTE Confidence: 0.855744011666667

00:28:25.148 --> 00:28:27.545 is of the result that we that I just

NOTE Confidence: 0.855744011666667

00:28:27.545 --> 00:28:29.181 showed is actually driven by features

NOTE Confidence: 0.855744011666667

00:28:29.181 --> 00:28:31.682 of the one data set that we used as

NOTE Confidence: 0.855744011666667

00:28:31.682 --> 00:28:33.818 opposed to other datasets where we

NOTE Confidence: 0.855744011666667

00:28:33.818 --> 00:28:36.318 find this across multiple datasets.

NOTE Confidence: 0.855744011666667

00:28:36.320 --> 00:28:40.540 So gauge is now comparing No2 disparities

NOTE Confidence: 0.855744011666667

00:28:40.540 --> 00:28:43.434 for four population subgroups using

NOTE Confidence: 0.855744011666667

00:28:43.434 --> 00:28:45.678 the EPA air quality system regulatory

NOTE Confidence: 0.855744011666667

00:28:45.678 --> 00:28:48.138 monitors on the left hand side here.

NOTE Confidence: 0.855744011666667

00:28:48.140 --> 00:28:50.975 For the 10 most populous cities in the US,

NOTE Confidence: 0.855744011666667

00:28:50.980 --> 00:28:53.122 the numbers on the right show the

NOTE Confidence: 0.855744011666667

00:28:53.122 --> 00:28:55.038 number of monitors in those cities.

NOTE Confidence: 0.855744011666667

00:28:55.040 --> 00:28:56.360 And we see a pattern that's

NOTE Confidence: 0.855744011666667

00:28:56.360 --> 00:28:57.800 kind of all over the place,

NOTE Confidence: 0.855744011666667

00:28:57.800 --> 00:28:59.212 in fact no pattern.

NOTE Confidence: 0.855744011666667

00:28:59.212 --> 00:29:01.405 So this these air quality system

NOTE Confidence: 0.855744011666667

00:29:01.405 --> 00:29:03.530 monitors are not able basically

NOTE Confidence: 0.855744011666667

00:29:03.530 --> 00:29:05.584 to capture the disparities that

NOTE Confidence: 0.855744011666667

00:29:05.584 --> 00:29:07.832 we think exist and that a lot of

NOTE Confidence: 0.855744011666667

00:29:07.832 --> 00:29:10.016 other studies have found to exist.

NOTE Confidence: 0.855744011666667

00:29:10.020 --> 00:29:12.211 When we use a land use regression

NOTE Confidence: 0.855744011666667

00:29:12.211 --> 00:29:13.700 model for nitrogen dioxide,

NOTE Confidence: 0.855744011666667

00:29:13.700 --> 00:29:16.016 which uses statistical approaches

NOTE Confidence: 0.855744011666667

00:29:16.016 --> 00:29:18.332 to approximate No2 concentrations

NOTE Confidence: 0.855744011666667

00:29:18.332 --> 00:29:21.066 at pretty high resolution across

NOTE Confidence: 0.855744011666667

00:29:21.066 --> 00:29:23.300 the entire continental US,

NOTE Confidence: 0.855744011666667

00:29:23.300 --> 00:29:28.260 we see a stronger pattern pop out here.

NOTE Confidence: 0.855744011666667

00:29:28.260 --> 00:29:30.048 So for every major city we

NOTE Confidence: 0.855744011666667

00:29:30.048 --> 00:29:31.240 have the the lowest

NOTE Confidence: 0.868242810416667

00:29:31.309 --> 00:29:33.449 No2 concentrations in the non

NOTE Confidence: 0.868242810416667

00:29:33.449 --> 00:29:35.589 Hispanic white population and higher

NOTE Confidence: 0.868242810416667

00:29:35.655 --> 00:29:37.859 concentrations among the Hispanic,

NOTE Confidence: 0.868242810416667

00:29:37.860 --> 00:29:39.540 Asian and black populations.

NOTE Confidence: 0.868242810416667

00:29:39.540 --> 00:29:41.900 The ordering. Differs by by city,

NOTE Confidence: 0.868242810416667

00:29:41.900 --> 00:29:45.110 but it's very similar to what we find

NOTE Confidence: 0.868242810416667

00:29:45.110 --> 00:29:47.666 using just the troponin No2 columns.

NOTE Confidence: 0.868242810416667

00:29:47.670 --> 00:29:50.238 So this is the land use regression model.

NOTE Confidence: 0.868242810416667

00:29:50.240 --> 00:29:51.878 Approximates surface level

NOTE Confidence: 0.868242810416667

00:29:51.878 --> 00:29:53.516 and O2 concentrations.

NOTE Confidence: 0.868242810416667

00:29:53.520 --> 00:29:58.177 The Tropo me data is No2 columns that

NOTE Confidence: 0.868242810416667

00:29:58.177 --> 00:30:00.559 are more directly from the satellite

NOTE Confidence: 0.868242810416667

00:30:00.560 --> 00:30:02.496 and we see a very similar pattern here.

NOTE Confidence: 0.868242810416667

00:30:02.500 --> 00:30:05.641 We see that for both the non Hispanic white

NOTE Confidence: 0.868242810416667

00:30:05.641 --> 00:30:07.830 population has the lowest No2 concentrations.

NOTE Confidence: 0.868242810416667

00:30:07.830 --> 00:30:10.440 For some cities we see that.

NOTE Confidence: 0.868242810416667

00:30:10.440 --> 00:30:11.944 Ordering of the population

NOTE Confidence: 0.868242810416667

00:30:11.944 --> 00:30:13.448 subgroups is very similar,

NOTE Confidence: 0.868242810416667

00:30:13.450 --> 00:30:14.658 so in Philadelphia the

NOTE Confidence: 0.868242810416667

00:30:14.658 --> 00:30:15.866 ordering is very similar.

NOTE Confidence: 0.868242810416667

00:30:15.870 --> 00:30:17.928 In other cities we see differences,

NOTE Confidence: 0.868242810416667

00:30:17.930 --> 00:30:20.770 but nevertheless there's much closer

NOTE Confidence: 0.868242810416667

00:30:20.770 --> 00:30:22.230 consistency between the land use

NOTE Confidence: 0.868242810416667

00:30:22.230 --> 00:30:24.319 regression data set and the troponin data

NOTE Confidence: 0.868242810416667

00:30:24.319 --> 00:30:26.328 set compared with the monitor data set.

NOTE Confidence: 0.868242810416667

00:30:26.330 --> 00:30:27.606 It's really not surprising.

NOTE Confidence: 0.868242810416667

00:30:27.606 --> 00:30:30.139 I mean the monitor data set was not

NOTE Confidence: 0.868242810416667

00:30:30.139 --> 00:30:32.085 intended to be used for this purpose

NOTE Confidence: 0.868242810416667

00:30:32.085 --> 00:30:34.374 and we're really was intended to

NOTE Confidence: 0.868242810416667

00:30:34.374 --> 00:30:35.930 monitor regional average pollution

NOTE Confidence: 0.868242810416667

00:30:35.930 --> 00:30:38.320 and not neighborhood scale pollution

NOTE Confidence: 0.868242810416667

00:30:38.320 --> 00:30:40.320 that differs within cities.

NOTE Confidence: 0.868242810416667

00:30:40.320 --> 00:30:41.600 So that was for No2.

NOTE Confidence: 0.868242810416667

00:30:41.600 --> 00:30:43.420 That would really LED us to wonder,

NOTE Confidence: 0.868242810416667

00:30:43.420 --> 00:30:43.743 OK,

NOTE Confidence: 0.868242810416667

00:30:43.743 --> 00:30:47.191 well the data set that you use for N2 has

NOTE Confidence: 0.868242810416667

00:30:47.191 --> 00:30:50.369 a big impact on the estimated disparities.

NOTE Confidence: 0.868242810416667

00:30:50.370 --> 00:30:52.430 What about for PM 2.5,

NOTE Confidence: 0.868242810416667

00:30:52.430 --> 00:30:54.530 which is a prudent that doesn't vary

NOTE Confidence: 0.868242810416667

00:30:54.530 --> 00:30:56.267 as much spatially as an O2 does,

NOTE Confidence: 0.868242810416667

00:30:56.270 --> 00:30:57.722 and the two has a very

NOTE Confidence: 0.868242810416667

00:30:57.722 --> 00:30:58.448 short atmospheric lifetime,

NOTE Confidence: 0.868242810416667

00:30:58.450 --> 00:31:01.306 it stays pretty close to the mission source.

NOTE Confidence: 0.868242810416667

00:31:01.310 --> 00:31:04.790 PM 2.5 has a lot more emission sources.

NOTE Confidence: 0.868242810416667

00:31:04.790 --> 00:31:06.778 A lot of it is secondarily formed

NOTE Confidence: 0.868242810416667

00:31:06.778 --> 00:31:07.630 in the atmosphere.

NOTE Confidence: 0.868242810416667

00:31:07.630 --> 00:31:09.166 It lives longer in the atmosphere,

NOTE Confidence: 0.868242810416667

00:31:09.170 --> 00:31:10.898 so it spreads out and sort

NOTE Confidence: 0.868242810416667

00:31:10.898 --> 00:31:11.762 of smooth spatially.

NOTE Confidence: 0.868242810416667

00:31:11.770 --> 00:31:13.726 So we but there's a lot

NOTE Confidence: 0.868242810416667

00:31:13.726 --> 00:31:15.334 of attention on PM 2.5,

NOTE Confidence: 0.868242810416667

00:31:15.334 --> 00:31:15.646 right,

NOTE Confidence: 0.868242810416667

00:31:15.646 --> 00:31:17.206 the Justice 40 initiative of

NOTE Confidence: 0.868242810416667

00:31:17.206 --> 00:31:18.730 this current administration.

NOTE Confidence: 0.868242810416667

00:31:18.730 --> 00:31:20.326 This is a new initiative that

NOTE Confidence: 0.868242810416667

00:31:20.326 --> 00:31:22.779 is aimed at 40% of the benefits.

NOTE Confidence: 0.868242810416667

00:31:22.779 --> 00:31:24.631 Of federal investments going

NOTE Confidence: 0.868242810416667

00:31:24.631 --> 00:31:26.020 to disadvantaged communities,

NOTE Confidence: 0.868242810416667

00:31:26.020 --> 00:31:28.436 the data set they're using to do that,

NOTE Confidence: 0.868242810416667

00:31:28.440 --> 00:31:30.408 to identify communities as

NOTE Confidence: 0.868242810416667

00:31:30.408 --> 00:31:32.868 disadvantaged as a 12 kilometer

NOTE Confidence: 0.868242810416667

00:31:32.868 --> 00:31:35.384 spatial resolution for PM 2.5.

NOTE Confidence: 0.868242810416667

00:31:35.384 --> 00:31:37.644 That's this CMAC model monitor

NOTE Confidence: 0.868242810416667

00:31:37.644 --> 00:31:39.000 fusion data set.

NOTE Confidence: 0.868242810416667

00:31:39.000 --> 00:31:41.376 That's the one that's used in EJ screen.

NOTE Confidence: 0.868242810416667

00:31:41.380 --> 00:31:43.436 It's used in a lot of EPA regulatory

NOTE Confidence: 0.868242810416667

00:31:43.436 --> 00:31:45.006 support documents and now it's used

NOTE Confidence: 0.868242810416667

00:31:45.006 --> 00:31:46.518 in the climate and economic justice

NOTE Confidence: 0.868242810416667

00:31:46.569 --> 00:31:47.854 screening tool suggest that is

NOTE Confidence: 0.868242810416667

00:31:47.854 --> 00:31:49.459 used for the Justice 40 initiative.

NOTE Confidence: 0.868242810416667

00:31:49.459 --> 00:31:50.416 So we wondered,

NOTE Confidence: 0.868242810416667

00:31:50.416 --> 00:31:52.806 if we used a different high resolution

NOTE Confidence: 0.868242810416667

00:31:52.806 --> 00:31:54.866 data set that's now available

NOTE Confidence: 0.868242810416667

00:31:54.866 --> 00:31:56.514 from the scientific community,

NOTE Confidence: 0.868242810416667

00:31:56.520 --> 00:31:58.650 would that lead to differences in

NOTE Confidence: 0.868242810416667

00:31:58.650 --> 00:32:00.497 which communities are flagged as

NOTE Confidence: 0.868242810416667

00:32:00.497 --> 00:32:02.717 disadvantaged in the Justice 40 initiative?

NOTE Confidence: 0.868242810416667

00:32:02.720 --> 00:32:05.700 So we're now comparing.

NOTE Confidence: 0.868242810416667

00:32:05.700 --> 00:32:07.980 The CMAC Model monitor fusion data

NOTE Confidence: 0.868242810416667

00:32:07.980 --> 00:32:10.348 set at 12 kilometer spatial resolution

NOTE Confidence: 0.868242810416667

00:32:10.348 --> 00:32:13.057 with the the data set I talked

NOTE Confidence: 0.868242810416667

00:32:13.057 --> 00:32:15.488 about earlier from the Washu team,

NOTE Confidence: 0.868242810416667

00:32:15.490 --> 00:32:19.041 the bins unclear at all data set that

NOTE Confidence: 0.868242810416667

00:32:19.041 --> 00:32:21.903 fuses satellites with a geophysical model.

NOTE Confidence: 0.868242810416667

00:32:21.910 --> 00:32:24.214 And then there's a new data set led

NOTE Confidence: 0.868242810416667

00:32:24.214 --> 00:32:26.842 by Haresh mini that's available at 50

NOTE Confidence: 0.868242810416667

00:32:26.842 --> 00:32:28.827 meter resolution within cities and

NOTE Confidence: 0.868242810416667

00:32:28.893 --> 00:32:31.515 1 kilometer resolution outside of cities.

NOTE Confidence: 0.868242810416667

00:32:31.520 --> 00:32:33.224 And you can see just looking

NOTE Confidence: 0.868242810416667

00:32:33.224 --> 00:32:34.360 at the spatial resolution,

NOTE Confidence: 0.878951873333333

00:32:34.360 --> 00:32:35.179 the spatial distribution

NOTE Confidence: 0.878951873333333

00:32:35.179 --> 00:32:36.817 in Los Angeles at the top,

NOTE Confidence: 0.878951873333333

00:32:36.820 --> 00:32:38.668 Chicago in the middle and Phoenix

NOTE Confidence: 0.878951873333333

00:32:38.668 --> 00:32:40.280 on the bottom. These datasets,

NOTE Confidence: 0.878951873333333

00:32:40.280 --> 00:32:42.320 they look somewhat similar in terms

NOTE Confidence: 0.878951873333333

00:32:42.320 --> 00:32:44.596 of their being a BLOB over the city.

NOTE Confidence: 0.878951873333333

00:32:44.600 --> 00:32:47.048 But once you start to look a little bit

NOTE Confidence: 0.878951873333333

00:32:47.048 --> 00:32:49.540 closer, they really differ in terms of

NOTE Confidence: 0.878951873333333

00:32:49.540 --> 00:32:51.384 which neighborhoods are popping out

NOTE Confidence: 0.878951873333333

00:32:51.384 --> 00:32:52.971 at having the highest concentrations.

NOTE Confidence: 0.878951873333333

00:32:52.971 --> 00:32:56.099 So this is still a work in progress,

NOTE Confidence: 0.878951873333333

00:32:56.100 --> 00:32:58.156 but this is led by Doctor Tess Carter,

NOTE Confidence: 0.878951873333333

00:32:58.160 --> 00:33:01.544 who just recently finished her PhD at MIT.

NOTE Confidence: 0.878951873333333

00:33:01.550 --> 00:33:03.335 And I just want to point your

NOTE Confidence: 0.878951873333333

00:33:03.335 --> 00:33:05.160 attention to the top few rows here,

NOTE Confidence: 0.878951873333333

00:33:05.160 --> 00:33:07.310 which show all census tracts,

NOTE Confidence: 0.878951873333333

00:33:07.310 --> 00:33:10.910 urban tracts and rural tracks across the US.

NOTE Confidence: 0.878951873333333

00:33:10.910 --> 00:33:13.459 On the left hand side here is that

NOTE Confidence: 0.878951873333333

00:33:13.459 --> 00:33:15.604 comparing the most non Hispanic

NOTE Confidence: 0.878951873333333

00:33:15.604 --> 00:33:17.800 white populations to the least

NOTE Confidence: 0.878951873333333

00:33:17.800 --> 00:33:19.840 non Hispanic white populations and

NOTE Confidence: 0.878951873333333

00:33:19.840 --> 00:33:23.263 then on the right hand side is most

NOTE Confidence: 0.878951873333333

00:33:23.263 --> 00:33:24.983 Hispanic versus least Hispanic.

NOTE Confidence: 0.878951873333333

00:33:24.990 --> 00:33:27.125 And we see for each of these

NOTE Confidence: 0.878951873333333

00:33:27.125 --> 00:33:28.890 three datasets the CMAC Fusion,

NOTE Confidence: 0.878951873333333

00:33:28.890 --> 00:33:32.070 the vans angular .01 is that

NOTE Confidence: 0.878951873333333

00:33:32.070 --> 00:33:34.949 spatial resolution and then a mini,

NOTE Confidence: 0.878951873333333

00:33:34.950 --> 00:33:37.428 all three of these data sets are

NOTE Confidence: 0.878951873333333

00:33:37.428 --> 00:33:39.758 very consistent in what they show

NOTE Confidence: 0.878951873333333

00:33:39.758 --> 00:33:41.346 for at those geographies.

NOTE Confidence: 0.878951873333333

00:33:41.350 --> 00:33:43.934 And it's very similar to for each region.

NOTE Confidence: 0.878951873333333

00:33:43.940 --> 00:33:46.388 The absolute magnitude of the values

NOTE Confidence: 0.878951873333333

00:33:46.388 --> 00:33:49.900 of the PM 2.5 concentrations differ,

NOTE Confidence: 0.878951873333333

00:33:49.900 --> 00:33:51.226 but the disparities,

NOTE Confidence: 0.878951873333333

00:33:51.226 --> 00:33:53.878 the patterns and disparity are similar.

NOTE Confidence: 0.878951873333333

00:33:53.880 --> 00:33:56.400 This is on a regional average basis.

NOTE Confidence: 0.878951873333333

00:33:56.400 --> 00:33:57.740 So what this tells us,

NOTE Confidence: 0.878951873333333

00:33:57.740 --> 00:34:00.080 I think I'm still processing this,

NOTE Confidence: 0.878951873333333

00:34:00.080 --> 00:34:02.740 is that on a regional average basis,

NOTE Confidence: 0.878951873333333

00:34:02.740 --> 00:34:05.324 this EMAC data set not so bad for

NOTE Confidence: 0.878951873333333

00:34:05.324 --> 00:34:06.820 estimating those disparities.

NOTE Confidence: 0.878951873333333

00:34:06.820 --> 00:34:08.716 And you can imagine why that might be.

NOTE Confidence: 0.878951873333333

00:34:08.720 --> 00:34:09.875 For PM 2.5,

NOTE Confidence: 0.878951873333333

00:34:09.875 --> 00:34:12.185 we have two things happening simultaneously.

NOTE Confidence: 0.878951873333333

00:34:12.190 --> 00:34:14.130 We have.

NOTE Confidence: 0.878951873333333

00:34:14.130 --> 00:34:17.568 We have regional PM 2.5 concentrations.

NOTE Confidence: 0.878951873333333

00:34:17.570 --> 00:34:19.796 PM is sort of higher in California

NOTE Confidence: 0.878951873333333

00:34:19.796 --> 00:34:21.984 and the southwest US than it is in

NOTE Confidence: 0.878951873333333

00:34:21.984 --> 00:34:24.056 other parts of the US and we have

NOTE Confidence: 0.878951873333333

00:34:24.056 --> 00:34:26.030 that happening at the same time as

NOTE Confidence: 0.878951873333333

00:34:26.030 --> 00:34:27.670 regional sorting of populations.

NOTE Confidence: 0.878951873333333

00:34:27.670 --> 00:34:30.130 There's a very large Hispanic population,

NOTE Confidence: 0.878951873333333

00:34:30.130 --> 00:34:30.854 for example,

NOTE Confidence: 0.878951873333333

00:34:30.854 --> 00:34:32.664 in California and the southwest

NOTE Confidence: 0.878951873333333

00:34:32.664 --> 00:34:34.537 breathing those high PPM concentrations

NOTE Confidence: 0.878951873333333

00:34:34.537 --> 00:34:35.985 in that same region.

NOTE Confidence: 0.878951873333333

00:34:35.990 --> 00:34:38.643 So that's sort of regional nature of

NOTE Confidence: 0.878951873333333

00:34:38.643 --> 00:34:41.167 both population sorting as well as pollution.

NOTE Confidence: 0.878951873333333

00:34:41.170 --> 00:34:42.328 That's one effect.

NOTE Confidence: 0.878951873333333

00:34:42.328 --> 00:34:44.258 The second effect is what's

NOTE Confidence: 0.878951873333333

00:34:44.258 --> 00:34:45.879 happening in urban areas.

NOTE Confidence: 0.878951873333333

00:34:45.880 --> 00:34:48.805 PM 2.5 has some intra

NOTE Confidence: 0.878951873333333

00:34:48.805 --> 00:34:50.560 urban spatial variability,

NOTE Confidence: 0.878951873333333

00:34:50.560 --> 00:34:53.176 or so the literature tells us.

NOTE Confidence: 0.878951873333333

00:34:53.180 --> 00:34:54.122 And that,

NOTE Confidence: 0.878951873333333

00:34:54.122 --> 00:34:55.064 you know,

NOTE Confidence: 0.878951873333333

00:34:55.064 --> 00:34:56.948 driven by anthropogenic sources

NOTE Confidence: 0.878951873333333

00:34:56.948 --> 00:34:59.488 within cities could be contributing

NOTE Confidence: 0.878951873333333

00:34:59.490 --> 00:35:02.490 to differences in neighborhood scale

NOTE Confidence: 0.878951873333333

00:35:02.490 --> 00:35:04.890 pollution levels within cities.

NOTE Confidence: 0.878951873333333

00:35:04.890 --> 00:35:07.123 So this maybe is actually not that

NOTE Confidence: 0.878951873333333

00:35:07.123 --> 00:35:08.777 surprising that this lines up

NOTE Confidence: 0.878951873333333

00:35:08.777 --> 00:35:10.691 pretty well regardless of the data

NOTE Confidence: 0.878951873333333

00:35:10.691 --> 00:35:12.413 set because the spatial resolution

NOTE Confidence: 0.878951873333333

00:35:12.413 --> 00:35:14.465 of data set doesn't matter that

NOTE Confidence: 0.878951873333333

00:35:14.465 --> 00:35:16.066 much for that regional effect,

NOTE Confidence: 0.878951873333333

00:35:16.066 --> 00:35:17.950 that first effect I was describing.

NOTE Confidence: 0.878951873333333

00:35:17.950 --> 00:35:21.010 But for the intra urban effects,

NOTE Confidence: 0.878951873333333

00:35:21.010 --> 00:35:23.354 the 12 core meter data set is not

NOTE Confidence: 0.878951873333333

00:35:23.354 --> 00:35:26.111 going to be able to capture those

NOTE Confidence: 0.878951873333333

00:35:26.111 --> 00:35:27.787 that intra urban variability.

NOTE Confidence: 0.878951873333333

00:35:27.790 --> 00:35:29.806 So what do we see within cities?

NOTE Confidence: 0.878951873333333

00:35:29.810 --> 00:35:32.350 We see something different so.

NOTE Confidence: 0.878951873333333

00:35:32.350 --> 00:35:35.122 In the top 10 most populated

NOTE Confidence: 0.878951873333333

00:35:35.122 --> 00:35:36.970 cities across the US.

NOTE Confidence: 0.878951873333333

00:35:36.970 --> 00:35:38.920 One thing is consistent and that

NOTE Confidence: 0.878951873333333

00:35:38.920 --> 00:35:40.651 the non Hispanic white population

NOTE Confidence: 0.878951873333333

00:35:40.651 --> 00:35:43.059 has the lowest PM 2.5 concentration

NOTE Confidence: 0.878951873333333

00:35:43.059 --> 00:35:45.657 in all three of these datasets.

NOTE Confidence: 0.894682181538461

00:35:45.660 --> 00:35:47.676 So we see a lot of the

NOTE Confidence: 0.894682181538461

00:35:47.676 --> 00:35:49.380 dark blue color left of 1.

NOTE Confidence: 0.894682181538461

00:35:49.380 --> 00:35:55.188 One is the average the the the mean PM 2.5

NOTE Confidence: 0.894682181538461

00:35:55.188 --> 00:35:57.673 concentration for the entire population.

NOTE Confidence: 0.894682181538461

00:35:57.680 --> 00:36:00.482 The non Hispanic white population has

NOTE Confidence: 0.894682181538461

00:36:00.482 --> 00:36:02.714 lower than average concentrations for

NOTE Confidence: 0.894682181538461

00:36:02.714 --> 00:36:04.786 every one of these major cities in

NOTE Confidence: 0.894682181538461

00:36:04.786 --> 00:36:07.416 all of the datasets but the ordering.

NOTE Confidence: 0.894682181538461

00:36:07.420 --> 00:36:09.260 Of the other population subgroups

NOTE Confidence: 0.894682181538461

00:36:09.260 --> 00:36:11.784 really varies quite a bit depending on

NOTE Confidence: 0.894682181538461

00:36:11.784 --> 00:36:14.272 the data set and that again is driven

NOTE Confidence: 0.894682181538461

00:36:14.343 --> 00:36:16.659 by the spatial distribution of the

NOTE Confidence: 0.894682181538461

00:36:16.659 --> 00:36:18.490 concentrations in the input datasets.

NOTE Confidence: 0.894682181538461

00:36:18.490 --> 00:36:21.010 I want to point out a couple other things.

NOTE Confidence: 0.894682181538461

00:36:21.010 --> 00:36:22.470 The CMAC Fusion data set,

NOTE Confidence: 0.894682181538461

00:36:22.470 --> 00:36:24.576 that 12 kilometer data set that's

NOTE Confidence: 0.894682181538461

00:36:24.576 --> 00:36:27.194 being used by the Justice 40 initiative

NOTE Confidence: 0.894682181538461

00:36:27.194 --> 00:36:29.847 team right now that has the least

NOTE Confidence: 0.894682181538461

00:36:29.850 --> 00:36:31.754 variability between population subgroups.

NOTE Confidence: 0.894682181538461

00:36:31.754 --> 00:36:33.658 And again not surprising,

NOTE Confidence: 0.894682181538461

00:36:33.660 --> 00:36:36.198 this is 12 kilometer datasets not

NOTE Confidence: 0.894682181538461

00:36:36.198 --> 00:36:37.467 capturing that heterogeneity.

NOTE Confidence: 0.894682181538461

00:36:37.470 --> 00:36:39.486 But we definitely see that play out

NOTE Confidence: 0.894682181538461

00:36:39.486 --> 00:36:41.997 or we have the the narrowest range

NOTE Confidence: 0.894682181538461

00:36:41.997 --> 00:36:45.546 here for I just picked up Philadelphia

NOTE Confidence: 0.894682181538461

00:36:45.546 --> 00:36:48.199 for Chicago and for New York.

NOTE Confidence: 0.894682181538461

00:36:48.200 --> 00:36:49.510 But then there's really interesting

NOTE Confidence: 0.894682181538461

00:36:49.510 --> 00:36:50.296 things that happen.

NOTE Confidence: 0.894682181538461

00:36:50.300 --> 00:36:51.604 So New York, Chicago,

NOTE Confidence: 0.894682181538461

00:36:51.604 --> 00:36:53.234 and Phoenix all show pretty

NOTE Confidence: 0.894682181538461

00:36:53.234 --> 00:36:54.339 different effects here,

NOTE Confidence: 0.894682181538461

00:36:54.340 --> 00:36:58.676 where in New York we have the same

NOTE Confidence: 0.894682181538461

00:36:58.680 --> 00:37:00.680 ranking of population subgroups in

NOTE Confidence: 0.894682181538461

00:37:00.680 --> 00:37:03.356 terms of their PM 2.5 concentration for

NOTE Confidence: 0.894682181538461

00:37:03.356 --> 00:37:06.230 both of the two high resolution datasets,

NOTE Confidence: 0.894682181538461

00:37:06.230 --> 00:37:09.174 but not in the CMAC Fusion data set.

NOTE Confidence: 0.894682181538461

00:37:09.180 --> 00:37:09.838 In Chicago,

NOTE Confidence: 0.894682181538461

00:37:09.838 --> 00:37:11.812 we hardly get much variation at

NOTE Confidence: 0.894682181538461

00:37:11.812 --> 00:37:14.260 all in any of the three datasets.

NOTE Confidence: 0.894682181538461

00:37:14.260 --> 00:37:15.188 And then in Phoenix,

NOTE Confidence: 0.894682181538461

00:37:15.188 --> 00:37:16.880 all three of the data data sets,

NOTE Confidence: 0.894682181538461

00:37:16.880 --> 00:37:20.296 including CMAC, the CMAC Fusion data set,

NOTE Confidence: 0.894682181538461

00:37:20.300 --> 00:37:22.528 do have similar disparities

NOTE Confidence: 0.894682181538461

00:37:22.528 --> 00:37:24.756 across these population subgroups.

NOTE Confidence: 0.894682181538461

00:37:24.760 --> 00:37:26.328 So we're still trying to dig into

NOTE Confidence: 0.894682181538461

00:37:26.328 --> 00:37:28.160 each of these cities and understand

NOTE Confidence: 0.894682181538461

00:37:28.160 --> 00:37:30.000 why they're showing these different

NOTE Confidence: 0.894682181538461

00:37:30.000 --> 00:37:30.736 different patterns.

NOTE Confidence: 0.894682181538461

00:37:30.740 --> 00:37:33.624 I'm really excited about the future because.

NOTE Confidence: 0.894682181538461

00:37:33.630 --> 00:37:35.148 The satellite data we have available

NOTE Confidence: 0.894682181538461

00:37:35.148 --> 00:37:35.654 right now,

NOTE Confidence: 0.894682181538461

00:37:35.660 --> 00:37:37.370 these this polar orbiting satellite data,

NOTE Confidence: 0.894682181538461

00:37:37.370 --> 00:37:39.714 that's a major improvement over what we had,

NOTE Confidence: 0.894682181538461

00:37:39.720 --> 00:37:41.280 what we had before,

NOTE Confidence: 0.894682181538461

00:37:41.280 --> 00:37:43.230 which is no satellite data,

NOTE Confidence: 0.894682181538461

00:37:43.230 --> 00:37:45.510 but we are now launching geostationary

NOTE Confidence: 0.894682181538461

00:37:45.510 --> 00:37:47.610 satellites which are going to hover

NOTE Confidence: 0.894682181538461

00:37:47.610 --> 00:37:49.430 over the US as the earth spins.

NOTE Confidence: 0.894682181538461

00:37:49.430 --> 00:37:51.155 It'll always be taking measurements

NOTE Confidence: 0.894682181538461

00:37:51.155 --> 00:37:53.522 over the US so tempo is launching

NOTE Confidence: 0.894682181538461

00:37:53.522 --> 00:37:56.275 in April and that will be a

NOTE Confidence: 0.894682181538461

00:37:56.275 --> 00:37:58.312 geostationary satellite that's

NOTE Confidence: 0.894682181538461

00:37:58.312 --> 00:38:00.349 measuring atmospheric composition.

NOTE Confidence: 0.894682181538461

00:38:00.350 --> 00:38:01.886 Really excited about that.

NOTE Confidence: 0.894682181538461

00:38:01.886 --> 00:38:03.806 And then Noah is working.

NOTE Confidence: 0.894682181538461

00:38:03.810 --> 00:38:05.526 On Geo EXO,

NOTE Confidence: 0.894682181538461

00:38:05.526 --> 00:38:08.810 which is an operational satellite that is

NOTE Confidence: 0.894682181538461

00:38:08.810 --> 00:38:11.420 intended to launch in the early twenty 30s.

NOTE Confidence: 0.894682181538461

00:38:11.420 --> 00:38:14.276 And there's so many stages of

NOTE Confidence: 0.894682181538461

00:38:14.280 --> 00:38:16.420 explaining why this is important.

NOTE Confidence: 0.894682181538461

00:38:16.420 --> 00:38:18.084 So they asked us to help them explain

NOTE Confidence: 0.894682181538461

00:38:18.084 --> 00:38:19.955 why this is important for air quality

NOTE Confidence: 0.894682181538461

00:38:19.955 --> 00:38:21.360 management and for public health.

NOTE Confidence: 0.894682181538461

00:38:21.360 --> 00:38:24.384 So we've been really happy to be

NOTE Confidence: 0.894682181538461

00:38:24.384 --> 00:38:27.153 working with them and showing them

NOTE Confidence: 0.894682181538461

00:38:27.153 --> 00:38:30.290 the value of satellite data for for

NOTE Confidence: 0.894682181538461

00:38:30.290 --> 00:38:32.880 managing air quality and for public health.

NOTE Confidence: 0.894682181538461

00:38:32.880 --> 00:38:35.499 And this is work led by Doctor Kate Odell,

NOTE Confidence: 0.894682181538461

00:38:35.500 --> 00:38:37.468 who is quantifying the number of

NOTE Confidence: 0.894682181538461

00:38:37.468 --> 00:38:39.365 four air quality alert days across

NOTE Confidence: 0.894682181538461

00:38:39.365 --> 00:38:41.461 the US that you would get if you

NOTE Confidence: 0.894682181538461

00:38:41.527 --> 00:38:42.718 had a geostationary.

NOTE Confidence: 0.894682181538461

00:38:42.720 --> 00:38:44.460 Satellite which is taking measurements

NOTE Confidence: 0.894682181538461

00:38:44.460 --> 00:38:46.996 across all hours of the daylight versus

NOTE Confidence: 0.894682181538461

00:38:46.996 --> 00:38:48.998 if you only had that one snapshot

NOTE Confidence: 0.894682181538461

00:38:48.998 --> 00:38:50.701 from a polar orbiting satellite

NOTE Confidence: 0.894682181538461

00:38:50.701 --> 00:38:53.179 at 1:30 PM and she's showing that

NOTE Confidence: 0.867879225333333

00:38:53.240 --> 00:38:55.333 the number of air quality alert days

NOTE Confidence: 0.867879225333333

00:38:55.333 --> 00:38:57.570 is much much higher for the Geo case,

NOTE Confidence: 0.867879225333333

00:38:57.570 --> 00:38:59.026 that's the Geo stationary

NOTE Confidence: 0.867879225333333

00:38:59.026 --> 00:39:00.846 case versus the Leo case.

NOTE Confidence: 0.867879225333333

00:39:00.850 --> 00:39:02.380 Leo stands for low Earth orbit,

NOTE Confidence: 0.867879225333333

00:39:02.380 --> 00:39:05.428 which is the polar orbiting satellites.

NOTE Confidence: 0.867879225333333

00:39:05.430 --> 00:39:08.174 And we wanted to look at the disparities

NOTE Confidence: 0.867879225333333

00:39:08.174 --> 00:39:10.929 in the populations that are receiving

NOTE Confidence: 0.867879225333333

00:39:10.929 --> 00:39:13.414 receiving these air quality alerts

NOTE Confidence: 0.867879225333333

00:39:13.414 --> 00:39:16.218 if we had the geostationary data

NOTE Confidence: 0.867879225333333

00:39:16.218 --> 00:39:18.448 versus the polar orbiting data.

NOTE Confidence: 0.867879225333333

00:39:18.450 --> 00:39:21.124 And she finds that actually you know

NOTE Confidence: 0.867879225333333

00:39:21.124 --> 00:39:23.430 while the magnitude differs overall,

NOTE Confidence: 0.867879225333333

00:39:23.430 --> 00:39:26.670 the pattern of who, what you know the,

NOTE Confidence: 0.867879225333333

00:39:26.670 --> 00:39:28.614 the population sub categories

NOTE Confidence: 0.867879225333333

00:39:28.614 --> 00:39:31.044 experiencing these poor air quality

NOTE Confidence: 0.867879225333333

00:39:31.044 --> 00:39:33.474 alert days is actually pretty

NOTE Confidence: 0.867879225333333

00:39:33.474 --> 00:39:36.039 similar depending regardless of the.

NOTE Confidence: 0.867879225333333

00:39:36.039 --> 00:39:38.211 Geostationary or the polar

NOTE Confidence: 0.867879225333333

00:39:38.211 --> 00:39:39.297 orbiting satellite?

NOTE Confidence: 0.867879225333333

00:39:39.300 --> 00:39:39.794 Really quickly,

NOTE Confidence: 0.867879225333333

00:39:39.794 --> 00:39:41.770 I want to go back to the framing

NOTE Confidence: 0.867879225333333

00:39:41.830 --> 00:39:43.534 of climate change, because again,

NOTE Confidence: 0.867879225333333

00:39:43.534 --> 00:39:45.469 air pollution and climate change

NOTE Confidence: 0.867879225333333

00:39:45.469 --> 00:39:47.519 come from the same sources.

NOTE Confidence: 0.867879225333333

00:39:47.520 --> 00:39:49.320 Anytime we burn fossil fuels

NOTE Confidence: 0.867879225333333

00:39:49.320 --> 00:39:50.760 and we burn biofuels,

NOTE Confidence: 0.867879225333333

00:39:50.760 --> 00:39:52.268 or releasing both air

NOTE Confidence: 0.867879225333333

00:39:52.268 --> 00:39:53.776 pollutants and greenhouse gases,

NOTE Confidence: 0.867879225333333

00:39:53.780 --> 00:39:55.260 we want to solve a lot of the

NOTE Confidence: 0.867879225333333

00:39:55.260 --> 00:39:56.538 problems that I just talked about.

NOTE Confidence: 0.867879225333333

00:39:56.540 --> 00:39:59.148 We could be burning less fuel and also

NOTE Confidence: 0.867879225333333

00:39:59.148 --> 00:40:01.597 be gaining by reducing CO2 emissions.

NOTE Confidence: 0.867879225333333

00:40:01.600 --> 00:40:03.490 So I have been able to partner

NOTE Confidence: 0.867879225333333

00:40:03.490 --> 00:40:05.545 for the last few years with C-40

NOTE Confidence: 0.867879225333333

00:40:05.545 --> 00:40:07.706 cities as well as a variety of

NOTE Confidence: 0.867879225333333

00:40:07.706 --> 00:40:09.326 other partners who had been.

NOTE Confidence: 0.867879225333333

00:40:09.330 --> 00:40:09.773 Planning,

NOTE Confidence: 0.867879225333333

00:40:09.773 --> 00:40:12.874 the largest worldwide effort for cities to

NOTE Confidence: 0.867879225333333

00:40:12.874 --> 00:40:15.400 undertake urban climate action planning.

NOTE Confidence: 0.867879225333333

00:40:15.400 --> 00:40:17.518 And these are cities that have

NOTE Confidence: 0.867879225333333

00:40:17.518 --> 00:40:19.555 committed to very deep decarbonization

NOTE Confidence: 0.867879225333333

00:40:19.555 --> 00:40:21.775 and creating ambitious plans

NOTE Confidence: 0.867879225333333

00:40:21.775 --> 00:40:23.995 for reducing greenhouse gases.

NOTE Confidence: 0.867879225333333

00:40:24.000 --> 00:40:26.148 And we help them understand not

NOTE Confidence: 0.867879225333333

00:40:26.148 --> 00:40:28.280 just their greenhouse gas reduction,

NOTE Confidence: 0.867879225333333

00:40:28.280 --> 00:40:30.056 which they're already very good at,

NOTE Confidence: 0.867879225333333

00:40:30.060 --> 00:40:33.210 but now understand also the reduction

NOTE Confidence: 0.867879225333333

00:40:33.210 --> 00:40:36.218 of PM 2.5 that they would get from

NOTE Confidence: 0.867879225333333

00:40:36.218 --> 00:40:37.804 taking those ambitious actions

NOTE Confidence: 0.867879225333333

00:40:37.804 --> 00:40:39.636 to reduce greenhouse gases.

NOTE Confidence: 0.867879225333333

00:40:39.640 --> 00:40:41.248 This is the framework that we

NOTE Confidence: 0.867879225333333

00:40:41.248 --> 00:40:42.052 did this within,

NOTE Confidence: 0.867879225333333

00:40:42.060 --> 00:40:43.770 and we implemented this in six

NOTE Confidence: 0.867879225333333

00:40:43.770 --> 00:40:45.280 pilot cities around the world.

NOTE Confidence: 0.867879225333333

00:40:45.280 --> 00:40:47.476 And I just want to show two of the

NOTE Confidence: 0.867879225333333

00:40:47.476 --> 00:40:48.916 examples of these are actually

NOTE Confidence: 0.867879225333333

00:40:48.916 --> 00:40:51.029 graphs that are now in these cities

NOTE Confidence: 0.867879225333333

00:40:51.029 --> 00:40:53.141 climate action plans for the first

NOTE Confidence: 0.867879225333333

00:40:53.141 --> 00:40:55.180 time integrating air quality into

NOTE Confidence: 0.867879225333333

00:40:55.180 --> 00:40:57.140 their climate action planning.

NOTE Confidence: 0.867879225333333

00:40:57.140 --> 00:41:00.556 So Buenos Aires saw their PM 2.5

NOTE Confidence: 0.867879225333333

00:41:00.556 --> 00:41:02.946 concentrations go down from about

NOTE Confidence: 0.867879225333333

00:41:02.946 --> 00:41:05.261 12 micrograms per meter cubed

NOTE Confidence: 0.867879225333333

00:41:05.261 --> 00:41:07.559 in 2050 to around 8,

NOTE Confidence: 0.867879225333333

00:41:07.560 --> 00:41:09.310 which was under the World

NOTE Confidence: 0.867879225333333

00:41:09.310 --> 00:41:10.010 Health Organization.

NOTE Confidence: 0.867879225333333

00:41:10.010 --> 00:41:11.634 Headline at the time we did this analysis,

NOTE Confidence: 0.867879225333333

00:41:11.640 --> 00:41:14.056 but it's now over the W 1 because

NOTE Confidence: 0.867879225333333

00:41:14.056 --> 00:41:15.630 that would has been reduced.

NOTE Confidence: 0.867879225333333

00:41:15.630 --> 00:41:17.730 And then Johannesburg took a bit

NOTE Confidence: 0.867879225333333

00:41:17.730 --> 00:41:19.857 of a different approach here where

NOTE Confidence: 0.867879225333333

00:41:19.857 --> 00:41:22.216 they looked at each type of action

NOTE Confidence: 0.867879225333333

00:41:22.286 --> 00:41:24.463 they could implement and they they

NOTE Confidence: 0.867879225333333

00:41:24.463 --> 00:41:26.641 looked at the percent of total

NOTE Confidence: 0.867879225333333

00:41:26.641 --> 00:41:28.125 PPM concentration reduction from

NOTE Confidence: 0.867879225333333

00:41:28.125 --> 00:41:29.770 that action versus the percent

NOTE Confidence: 0.867879225333333

00:41:29.770 --> 00:41:31.780 of total CO2 emission reductions.

NOTE Confidence: 0.867879225333333

00:41:31.780 --> 00:41:34.636 And the one that achieved the

NOTE Confidence: 0.867879225333333

00:41:34.636 --> 00:41:37.501 greatest dual benefit was a mode

NOTE Confidence: 0.867879225333333

00:41:37.501 --> 00:41:39.666 shift from on road vehicles.

NOTE Confidence: 0.867879225333333

00:41:39.670 --> 00:41:41.260 We're now helping them understand

NOTE Confidence: 0.867879225333333

00:41:41.260 --> 00:41:43.170 CO2 emissions a little bit more.

NOTE Confidence: 0.867879225333333

00:41:43.170 --> 00:41:44.607 So right now,

NOTE Confidence: 0.867879225333333

00:41:44.607 --> 00:41:47.481 each city is developing its own

NOTE Confidence: 0.867879225333333

00:41:47.481 --> 00:41:50.590 urban inventory of CO2 emissions,

NOTE Confidence: 0.867879225333333

00:41:50.590 --> 00:41:53.634 and that has advantages,

NOTE Confidence: 0.867879225333333

00:41:53.634 --> 00:41:55.917 strengths and weaknesses.

NOTE Confidence: 0.867879225333333

00:41:55.920 --> 00:41:58.075 The scientific community is very

NOTE Confidence: 0.867879225333333

00:41:58.075 --> 00:42:00.230 hard at work developing gridded

NOTE Confidence: 0.867879225333333

00:42:00.304 --> 00:42:02.812 CO2 emission data sets as well

NOTE Confidence: 0.867879225333333

00:42:02.812 --> 00:42:04.484 based on satellite observations

NOTE Confidence: 0.867879225333333

00:42:04.554 --> 00:42:05.969 of light at night and

NOTE Confidence: 0.879427664666667

00:42:05.970 --> 00:42:06.852 other data sources.

NOTE Confidence: 0.879427664666667

00:42:06.852 --> 00:42:08.910 And so we're looking at whether or

NOTE Confidence: 0.879427664666667

00:42:08.969 --> 00:42:10.604 not the self reported inventories

NOTE Confidence: 0.879427664666667

00:42:10.604 --> 00:42:12.958 from the cities match what we think

NOTE Confidence: 0.879427664666667

00:42:12.958 --> 00:42:14.950 might be happening in the scientific

NOTE Confidence: 0.879427664666667

00:42:14.950 --> 00:42:16.892 community using these gridded datasets.

NOTE Confidence: 0.879427664666667

00:42:16.892 --> 00:42:20.255 And this is work led by Doctor Doyon

NOTE Confidence: 0.879427664666667

00:42:20.255 --> 00:42:22.760 on where we he's comparing the GPC

NOTE Confidence: 0.879427664666667

00:42:22.760 --> 00:42:24.698 inventory that's the self reported

NOTE Confidence: 0.879427664666667

00:42:24.698 --> 00:42:27.164 inventory versus a very widely used.

NOTE Confidence: 0.879427664666667

00:42:27.170 --> 00:42:29.690 Um, globally gridded emissions inventory

NOTE Confidence: 0.879427664666667

00:42:29.690 --> 00:42:33.340 called Edgar and he sees that the there,

NOTE Confidence: 0.879427664666667

00:42:33.340 --> 00:42:34.396 sorry, in this other one is,

NOTE Confidence: 0.879427664666667

00:42:34.400 --> 00:42:37.228 is ODC, as well as the different

NOTE Confidence: 0.879427664666667

00:42:37.228 --> 00:42:39.116 gridded CO2 emissions data set.

NOTE Confidence: 0.879427664666667

00:42:39.116 --> 00:42:40.806 They want it pretty well.

NOTE Confidence: 0.879427664666667

00:42:40.810 --> 00:42:42.714 This is actually better than I might

NOTE Confidence: 0.879427664666667

00:42:42.714 --> 00:42:44.359 have expected prior to this project,

NOTE Confidence: 0.879427664666667

00:42:44.360 --> 00:42:47.112 but he sees a lot more scatter outside

NOTE Confidence: 0.879427664666667

00:42:47.112 --> 00:42:50.345 of the US and Europe and a lot more

NOTE Confidence: 0.879427664666667

00:42:50.345 --> 00:42:53.009 consistency in US and European cities.

NOTE Confidence: 0.879427664666667

00:42:53.010 --> 00:42:55.458 So just to conclude that climate

NOTE Confidence: 0.879427664666667

00:42:55.458 --> 00:42:57.900 change is worsening air pollution,

NOTE Confidence: 0.879427664666667

00:42:57.900 --> 00:43:00.558 which is already a leading factor

NOTE Confidence: 0.879427664666667

00:43:00.558 --> 00:43:03.179 for global health around the world.

NOTE Confidence: 0.879427664666667

00:43:03.180 --> 00:43:05.788 We have now access to data that we

NOTE Confidence: 0.879427664666667

00:43:05.788 --> 00:43:07.390 that's completely unprecedented,

NOTE Confidence: 0.879427664666667

00:43:07.390 --> 00:43:10.595 these novel geospatial datasets they're

NOTE Confidence: 0.879427664666667

00:43:10.595 --> 00:43:13.159 increasingly capable of providing.

NOTE Confidence: 0.879427664666667

00:43:13.160 --> 00:43:14.237 Information about pollution

NOTE Confidence: 0.879427664666667

00:43:14.237 --> 00:43:16.032 levels everywhere in the world

NOTE Confidence: 0.879427664666667

00:43:16.032 --> 00:43:17.860 with full geospatial coverage,

NOTE Confidence: 0.879427664666667

00:43:17.860 --> 00:43:21.003 high temporal frequency and in some cases

NOTE Confidence: 0.879427664666667

00:43:21.003 --> 00:43:23.959 now building long temporal trends too.

NOTE Confidence: 0.879427664666667

00:43:23.960 --> 00:43:24.746 Some of these,

NOTE Confidence: 0.879427664666667

00:43:24.746 --> 00:43:26.318 some of these satellites have been

NOTE Confidence: 0.879427664666667

00:43:26.318 --> 00:43:27.631 flying for years and that's enabled

NOTE Confidence: 0.879427664666667

00:43:27.631 --> 00:43:29.620 us to do a lot of different things.

NOTE Confidence: 0.879427664666667

00:43:29.620 --> 00:43:31.790 I just talked today about air pollution

NOTE Confidence: 0.879427664666667

00:43:31.790 --> 00:43:33.670 levels globally and at 13,000 cities,

NOTE Confidence: 0.879427664666667

00:43:33.670 --> 00:43:35.596 as well as intra urban disparities.

NOTE Confidence: 0.879427664666667

00:43:35.600 --> 00:43:37.532 But people are using these satellite

NOTE Confidence: 0.879427664666667

00:43:37.532 --> 00:43:40.017 data sets and all kinds of unique and

NOTE Confidence: 0.879427664666667

00:43:40.020 --> 00:43:42.336 very useful ways like spotting wildfire,

NOTE Confidence: 0.879427664666667

00:43:42.340 --> 00:43:44.308 smoke and dust storms.

NOTE Confidence: 0.879427664666667

00:43:44.308 --> 00:43:44.800 Thanks.

NOTE Confidence: 0.879427664666667

00:43:44.800 --> 00:43:45.661 And you know,

NOTE Confidence: 0.879427664666667

00:43:45.661 --> 00:43:47.096 I really think that this

NOTE Confidence: 0.879427664666667

00:43:47.096 --> 00:43:47.670 improved information,

NOTE Confidence: 0.879427664666667

00:43:47.670 --> 00:43:50.514 if we integrate this into our

NOTE Confidence: 0.879427664666667

00:43:50.514 --> 00:43:51.936 environmental management techniques,

NOTE Confidence: 0.879427664666667

00:43:51.940 --> 00:43:54.451 including policy development,

NOTE Confidence: 0.879427664666667

00:43:54.451 --> 00:43:58.636 we can achieve multiple societal

NOTE Confidence: 0.879427664666667

00:43:58.636 --> 00:44:00.310 improvements simultaneously.

NOTE Confidence: 0.879427664666667

00:44:00.310 --> 00:44:01.405 I've been really,

NOTE Confidence: 0.879427664666667

00:44:01.405 --> 00:44:03.960 really fortunate to be in a position

NOTE Confidence: 0.879427664666667

00:44:04.034 --> 00:44:06.310 now where I can be training the next

NOTE Confidence: 0.879427664666667

00:44:06.310 --> 00:44:08.859 generation to be using data sets like this,

NOTE Confidence: 0.879427664666667

00:44:08.860 --> 00:44:11.954 and there's new ways of doing environmental

NOTE Confidence: 0.879427664666667

00:44:11.954 --> 00:44:14.340 health that are now possible.

NOTE Confidence: 0.879427664666667

00:44:14.340 --> 00:44:16.120 So bringing that in,

NOTE Confidence: 0.879427664666667

00:44:16.120 --> 00:44:17.900 bringing in systems approaches

NOTE Confidence: 0.879427664666667

00:44:17.900 --> 00:44:21.595 and an equity and justice lens in

NOTE Confidence: 0.879427664666667

00:44:21.595 --> 00:44:23.775 addition to engaging multidisciplinary

NOTE Confidence: 0.879427664666667

00:44:23.775 --> 00:44:26.009 teams and diverse partners,

NOTE Confidence: 0.879427664666667

00:44:26.010 --> 00:44:27.949 I talked about some of the partners

NOTE Confidence: 0.879427664666667

00:44:27.949 --> 00:44:29.503 I've worked with including C-40

NOTE Confidence: 0.879427664666667

00:44:29.503 --> 00:44:31.439 cities and the DC government.

NOTE Confidence: 0.879427664666667

00:44:31.439 --> 00:44:33.977 That's just sort of scratching the

NOTE Confidence: 0.879427664666667

00:44:33.977 --> 00:44:36.590 surface that if you work directly

NOTE Confidence: 0.879427664666667

00:44:36.590 --> 00:44:38.705 with these action oriented partners

NOTE Confidence: 0.879427664666667

00:44:38.710 --> 00:44:40.666 from the beginning of a project,

NOTE Confidence: 0.879427664666667

00:44:40.670 --> 00:44:42.650 you can actually design a project

NOTE Confidence: 0.879427664666667

00:44:42.650 --> 00:44:44.959 to achieve the needs that they have.

NOTE Confidence: 0.879427664666667

00:44:44.960 --> 00:44:46.880 To improve life for people.

NOTE Confidence: 0.879427664666667

00:44:46.880 --> 00:44:47.960 And, you know,

NOTE Confidence: 0.879427664666667

00:44:47.960 --> 00:44:49.400 leveraging novel geospatial datasets

NOTE Confidence: 0.879427664666667

00:44:49.400 --> 00:44:51.119 is not something that I was,

NOTE Confidence: 0.879427664666667

00:44:51.120 --> 00:44:51.670 you know,

NOTE Confidence: 0.879427664666667

00:44:51.670 --> 00:44:51.945 well,

NOTE Confidence: 0.879427664666667

00:44:51.945 --> 00:44:53.860 actually I was trained to use novel

NOTE Confidence: 0.879427664666667

00:44:53.860 --> 00:44:55.160 geospatial datasets that were novel

NOTE Confidence: 0.879427664666667

00:44:55.160 --> 00:44:57.059 at the time that I did my training,

NOTE Confidence: 0.879427664666667

00:44:57.060 --> 00:44:58.808 which is before satellites.

NOTE Confidence: 0.879427664666667

00:44:58.808 --> 00:45:00.119 But you know,

NOTE Confidence: 0.879427664666667

00:45:00.120 --> 00:45:01.954 a lot of people in the field

NOTE Confidence: 0.879427664666667

00:45:01.954 --> 00:45:02.740 didn't have that,

NOTE Confidence: 0.879427664666667

00:45:02.740 --> 00:45:04.426 don't yet have that training and

NOTE Confidence: 0.879427664666667

00:45:04.426 --> 00:45:06.234 something that we can bring into

NOTE Confidence: 0.879427664666667

00:45:06.234 --> 00:45:07.576 public health more frequently.

NOTE Confidence: 0.879427664666667

00:45:07.576 --> 00:45:09.724 There's a lot of communities of

NOTE Confidence: 0.879427664666667

00:45:09.724 --> 00:45:11.577 practice to plug into as well.

NOTE Confidence: 0.879427664666667

00:45:11.580 --> 00:45:13.605 We've developed the climate and

NOTE Confidence: 0.879427664666667

00:45:13.605 --> 00:45:15.225 Health Institute at GW.

NOTE Confidence: 0.816738985

00:45:15.230 --> 00:45:17.267 We just are now completing a NASA

NOTE Confidence: 0.816738985

00:45:17.267 --> 00:45:18.924 supported team called satellite data

NOTE Confidence: 0.816738985

00:45:18.924 --> 00:45:20.729 for environmental justice that brought

NOTE Confidence: 0.816738985

00:45:20.729 --> 00:45:23.073 together a lot of people that were

NOTE Confidence: 0.816738985

00:45:23.073 --> 00:45:24.885 using satellite data for this purpose

NOTE Confidence: 0.816738985

00:45:24.890 --> 00:45:28.482 and a plug to shameless plug to get

NOTE Confidence: 0.816738985

00:45:28.482 --> 00:45:31.868 involved in the AGU health community,

NOTE Confidence: 0.816738985

00:45:31.870 --> 00:45:33.928 which you know includes a lot of

NOTE Confidence: 0.816738985

00:45:33.928 --> 00:45:36.299 people who are using these big

NOTE Confidence: 0.816738985

00:45:36.299 --> 00:45:38.199 geospatial datasets to answer

NOTE Confidence: 0.816738985

00:45:38.199 --> 00:45:39.624 environmental health problems.

NOTE Confidence: 0.816738985

00:45:39.630 --> 00:45:41.556 Very excited that Doctor Chen is

NOTE Confidence: 0.816738985

00:45:41.556 --> 00:45:43.370 part of that community as well.

NOTE Confidence: 0.816738985

00:45:43.370 --> 00:45:44.990 So that's it for me.

NOTE Confidence: 0.816738985

00:45:44.990 --> 00:45:47.102 Just wanted to acknowledge a lot

NOTE Confidence: 0.816738985

00:45:47.102 --> 00:45:49.032 of support and again reiterate

NOTE Confidence: 0.816738985

00:45:49.032 --> 00:45:51.211 that without open data sets none

NOTE Confidence: 0.816738985

00:45:51.211 --> 00:45:52.873 of this would have been possible.

NOTE Confidence: 0.816738985

00:45:52.880 --> 00:45:55.216 So thank you to the data set developers.

NOTE Confidence: 0.816738985

00:45:55.220 --> 00:45:55.630 Thank you.

NOTE Confidence: 0.57156815

00:46:01.440 --> 00:46:02.970 I think it takes around

NOTE Confidence: 0.57156815

00:46:02.970 --> 00:46:05.190 5 to 10 minutes for Q&A,

NOTE Confidence: 0.89760932

00:46:05.190 --> 00:46:06.878 so if you do have a question please.

NOTE Confidence: 0.8310598

00:46:08.050 --> 00:46:11.506 Sure. Thank you so much for stopping.

NOTE Confidence: 0.8310598

00:46:11.510 --> 00:46:12.428 It's really interesting.

NOTE Confidence: 0.8310598

00:46:12.428 --> 00:46:15.115 I, I know that one of the major

NOTE Confidence: 0.8310598

00:46:15.115 --> 00:46:17.027 concerns amongst environmental justice

NOTE Confidence: 0.8310598

00:46:17.027 --> 00:46:19.825 communities with datasets such as EJ

NOTE Confidence: 0.8310598

00:46:19.825 --> 00:46:21.889 screen is that they're not specific

NOTE Confidence: 0.8310598

00:46:21.889 --> 00:46:24.470 enough that they don't get down

NOTE Confidence: 0.8310598

00:46:24.470 --> 00:46:27.040 to that really granular level of.

NOTE Confidence: 0.8310598

00:46:27.040 --> 00:46:29.444 Look, fenceline impacts umm.

NOTE Confidence: 0.8310598

00:46:29.444 --> 00:46:31.848 And I'm curious how,

NOTE Confidence: 0.8310598

00:46:31.850 --> 00:46:35.310 when working with large datasets

NOTE Confidence: 0.8310598

00:46:35.310 --> 00:46:37.570 from satellites such as troponin,

NOTE Confidence: 0.8310598

00:46:37.570 --> 00:46:39.395 which only takes about once

NOTE Confidence: 0.8310598

00:46:39.395 --> 00:46:40.490 a day measurement,

NOTE Confidence: 0.8310598

00:46:40.490 --> 00:46:43.339 you can also bring in those qualitative

NOTE Confidence: 0.8310598

00:46:43.339 --> 00:46:45.718 data points from environmental justice

NOTE Confidence: 0.8310598

00:46:45.718 --> 00:46:48.964 communities on the ground to our

NOTE Confidence: 0.8310598

00:46:48.964 --> 00:46:50.608 experiencing air pollution impacts.

NOTE Confidence: 0.8310598

00:46:50.608 --> 00:46:53.170 I love that question because it really

NOTE Confidence: 0.8310598

00:46:53.230 --> 00:46:55.774 shows the value not just in this kind

NOTE Confidence: 0.8310598

00:46:55.774 --> 00:46:57.670 of quantitative data work that I do,

NOTE Confidence: 0.8310598

00:46:57.670 --> 00:46:59.644 but in the lived experience as well.

NOTE Confidence: 0.8310598

00:46:59.650 --> 00:47:01.738 And we've we've run into this

NOTE Confidence: 0.8310598

00:47:01.738 --> 00:47:04.010 multiple projects and I just couldn't

NOTE Confidence: 0.8310598

00:47:04.010 --> 00:47:06.030 agree more with that because.

NOTE Confidence: 0.8310598

00:47:06.030 --> 00:47:08.390 As I showed the we still have disagreement

NOTE Confidence: 0.8310598

00:47:08.390 --> 00:47:10.252 between several of the high resolution

NOTE Confidence: 0.8310598

00:47:10.252 --> 00:47:11.777 datasets that we're looking at.

NOTE Confidence: 0.8310598

00:47:11.780 --> 00:47:13.876 I mean they are better I think than

NOTE Confidence: 0.8310598

00:47:13.876 --> 00:47:15.600 the course resolution data set.

NOTE Confidence: 0.8310598

00:47:15.600 --> 00:47:16.410 But if you're,

NOTE Confidence: 0.8310598

00:47:16.410 --> 00:47:18.669 let's say you're looking at a map of

NOTE Confidence: 0.8310598

00:47:18.669 --> 00:47:20.797 Houston and you've got our land use

NOTE Confidence: 0.8310598

00:47:20.797 --> 00:47:22.655 regression data set of N2 and then

NOTE Confidence: 0.8310598

00:47:22.655 --> 00:47:24.584 the tricomi data set of two and you

NOTE Confidence: 0.8310598

00:47:24.584 --> 00:47:26.629 live in an area which is high in

NOTE Confidence: 0.8310598

00:47:26.629 --> 00:47:28.613 one data set and not in the other,

NOTE Confidence: 0.8310598

00:47:28.620 --> 00:47:29.170 what then?

NOTE Confidence: 0.8310598

00:47:29.170 --> 00:47:31.095 And you know where that is the

NOTE Confidence: 0.8310598

00:47:31.095 --> 00:47:32.547 reality we are in right now,

NOTE Confidence: 0.8310598

00:47:32.550 --> 00:47:36.030 we're in this messy space of data sets.

NOTE Confidence: 0.8310598

00:47:36.030 --> 00:47:38.442 Not matching at that granular scale

NOTE Confidence: 0.8310598

00:47:38.442 --> 00:47:41.195 and I just think it shows the

NOTE Confidence: 0.8310598

00:47:41.195 --> 00:47:43.920 limitation of what we can do with a,

NOTE Confidence: 0.8310598

00:47:43.920 --> 00:47:44.650 you know,

NOTE Confidence: 0.8310598

00:47:44.650 --> 00:47:45.380 one-size-fits-all approach

NOTE Confidence: 0.8310598

00:47:45.380 --> 00:47:47.205 you consistent across the US.

NOTE Confidence: 0.8310598

00:47:47.210 --> 00:47:50.493 We need to bring in people's lived

NOTE Confidence: 0.8310598

00:47:50.493 --> 00:47:52.937 experience and understanding of the

NOTE Confidence: 0.8310598

00:47:52.937 --> 00:47:55.322 local sources affecting their community

NOTE Confidence: 0.8310598

00:47:55.322 --> 00:47:57.950 for this datasets to be improved.

NOTE Confidence: 0.8310598

00:47:57.950 --> 00:48:00.838 How we do that, I think let's like.

NOTE Confidence: 0.8310598

00:48:00.840 --> 00:48:01.620 Get creative, right?

NOTE Confidence: 0.8310598

00:48:01.620 --> 00:48:04.005 I mean, we could bring in story

NOTE Confidence: 0.8310598

00:48:04.005 --> 00:48:05.870 maps of people's life experiences,

NOTE Confidence: 0.8310598

00:48:05.870 --> 00:48:08.014 you know, there's a lot of ways it's,

NOTE Confidence: 0.8310598

00:48:08.020 --> 00:48:09.470 it's not even just about,

NOTE Confidence: 0.8310598

00:48:09.470 --> 00:48:10.966 you know, community monitoring,

NOTE Confidence: 0.8310598

00:48:10.966 --> 00:48:12.836 which can be quite helpful.

NOTE Confidence: 0.8310598

00:48:12.840 --> 00:48:13.662 And, you know,

NOTE Confidence: 0.8310598

00:48:13.662 --> 00:48:14.758 we're rapidly expanding that

NOTE Confidence: 0.8310598

00:48:14.758 --> 00:48:16.159 in the US right now,

NOTE Confidence: 0.8310598

00:48:16.160 --> 00:48:17.324 but, you know.

NOTE Confidence: 0.8310598

00:48:17.324 --> 00:48:19.652 You have people going out and

NOTE Confidence: 0.8310598

00:48:19.660 --> 00:48:20.992 writing about their experiences,

NOTE Confidence: 0.8310598

00:48:20.992 --> 00:48:22.657 taking videos of their experience.

NOTE Confidence: 0.8310598

00:48:22.660 --> 00:48:25.159 So I think that's sort of community

NOTE Confidence: 0.8310598

00:48:25.159 --> 00:48:25.516 contributed,

NOTE Confidence: 0.8310598

00:48:25.520 --> 00:48:27.284 qualitative approach has a lot of value.

NOTE Confidence: 0.6888986

00:48:32.100 --> 00:48:34.310 Yes, just make sure there's any

NOTE Confidence: 0.6888986

00:48:34.310 --> 00:48:35.720 students have a question for us.

NOTE Confidence: 0.6888986

00:48:35.720 --> 00:48:37.988 Is there a hand over there?

NOTE Confidence: 0.6888986

00:48:37.990 --> 00:48:40.661 Umm, so my question or this, first of all,

NOTE Confidence: 0.6888986

00:48:40.661 --> 00:48:42.203 thank you for the fabulous presentation.

NOTE Confidence: 0.6888986

00:48:42.210 --> 00:48:43.890 I greatly enjoyed it.

NOTE Confidence: 0.6888986

00:48:43.890 --> 00:48:45.768 My question, slash comment is

NOTE Confidence: 0.6888986

00:48:45.768 --> 00:48:46.806 about environmental disparity.

NOTE Confidence: 0.6888986

00:48:46.810 --> 00:48:48.900 So I you know, a lot of times we see

NOTE Confidence: 0.6888986

00:48:48.967 --> 00:48:50.887 more and more and more beautiful,

NOTE Confidence: 0.6888986

00:48:50.890 --> 00:48:53.266 beautiful, more and more detailed maps.

NOTE Confidence: 0.6888986

00:48:53.270 --> 00:48:55.926 However, if we could press a button today

NOTE Confidence: 0.6888986

00:48:55.926 --> 00:48:58.747 that made exposure equal across the world,

NOTE Confidence: 0.6888986

00:48:58.750 --> 00:48:59.866 first of all, we press it.

NOTE Confidence: 0.6888986

00:48:59.870 --> 00:49:01.142 Second of all,

NOTE Confidence: 0.6888986

00:49:01.142 --> 00:49:02.414 environmental disparities would

NOTE Confidence: 0.6888986

00:49:02.414 --> 00:49:04.110 still exist because people

NOTE Confidence: 0.6888986

00:49:04.168 --> 00:49:05.908 respond differently to health.

NOTE Confidence: 0.6888986

00:49:05.910 --> 00:49:08.248 So my comment to you my question.

NOTE Confidence: 0.6888986

00:49:08.250 --> 00:49:09.769 Is. What are your thoughts on this?

NOTE Confidence: 0.6888986

00:49:09.770 --> 00:49:11.682 Because I have had.

NOTE Confidence: 0.6888986

00:49:11.682 --> 00:49:14.550 Like when I talk with communities,

NOTE Confidence: 0.6888986

00:49:14.550 --> 00:49:17.434 99 to 100% of them talk about

NOTE Confidence: 0.6888986

00:49:17.434 --> 00:49:19.360 exposure without talking about the

NOTE Confidence: 0.6888986

00:49:19.360 --> 00:49:21.905 fact that and it is a fact that we

NOTE Confidence: 0.6888986

00:49:21.905 --> 00:49:24.069 know that people respond differently.

NOTE Confidence: 0.6888986

00:49:24.070 --> 00:49:27.122 And to what degree do you think

NOTE Confidence: 0.6888986

00:49:27.122 --> 00:49:29.189 environmental health disparities should be?

NOTE Confidence: 0.6888986

00:49:29.190 --> 00:49:32.205 Are there may be some environmental

NOTE Confidence: 0.6888986

00:49:32.205 --> 00:49:34.360 disparities not incorporated into the

NOTE Confidence: 0.6888986

00:49:34.425 --> 00:49:36.550 world's most perfect exposure map?

NOTE Confidence: 0.6888986

00:49:36.550 --> 00:49:38.326 The way they agreed to you that we

NOTE Confidence: 0.6888986

00:49:38.326 --> 00:49:40.237 have very focused on pollution levels,

NOTE Confidence: 0.6888986

00:49:40.240 --> 00:49:41.925 and the same pollution level

NOTE Confidence: 0.6888986

00:49:41.925 --> 00:49:43.273 can cause dramatic different,

NOTE Confidence: 0.6888986

00:49:43.280 --> 00:49:44.810 dramatically different impacts

NOTE Confidence: 0.6888986

00:49:44.810 --> 00:49:46.340 for different populations.

NOTE Confidence: 0.6888986

00:49:46.340 --> 00:49:47.720 I showed that map of Washington,

NOTE Confidence: 0.6888986

00:49:47.720 --> 00:49:49.936 DC and the high PM 2.5 mortality rate

NOTE Confidence: 0.6888986

00:49:49.936 --> 00:49:52.709 on the eastern half and the low PM 2.5

NOTE Confidence: 0.6888986

00:49:52.709 --> 00:49:54.768 mortality rate on the western half.

NOTE Confidence: 0.6888986

00:49:54.770 --> 00:49:59.390 That actually comes from a pretty consistent

NOTE Confidence: 0.6888986

00:49:59.390 --> 00:50:02.288 PM 2.5 concentration for the entire city,

NOTE Confidence: 0.6888986

00:50:02.290 --> 00:50:05.670 but vastly different mortality rates.

NOTE Confidence: 0.6888986

00:50:05.670 --> 00:50:06.882 The, you know,

NOTE Confidence: 0.6888986

00:50:06.882 --> 00:50:09.306 Southeast Quadrant has had no hospital.

NOTE Confidence: 0.6888986

00:50:09.310 --> 00:50:10.170 GW Building went out.

NOTE Confidence: 0.6888986

00:50:10.170 --> 00:50:11.910 I'm very happy that that that's happening.

NOTE Confidence: 0.6888986

00:50:11.910 --> 00:50:12.846 But no hospital,

NOTE Confidence: 0.6888986

00:50:12.846 --> 00:50:14.406 so no access to healthcare,

NOTE Confidence: 0.6888986

00:50:14.410 --> 00:50:16.570 no easy access to healthcare.

NOTE Confidence: 0.6888986

00:50:16.570 --> 00:50:17.402 This is the same,

NOTE Confidence: 0.6888986

00:50:17.402 --> 00:50:17.818 you know,

NOTE Confidence: 0.6888986

00:50:17.820 --> 00:50:19.626 in cities all around the country

NOTE Confidence: 0.6888986

00:50:19.626 --> 00:50:21.629 and around the world that there's,

NOTE Confidence: 0.6888986

00:50:21.630 --> 00:50:22.252 you know,

NOTE Confidence: 0.6888986

00:50:22.252 --> 00:50:24.429 social determinants of health are a major,

NOTE Confidence: 0.6888986

00:50:24.430 --> 00:50:24.858 major.

NOTE Confidence: 0.6888986

00:50:24.858 --> 00:50:26.998 Doctor Diamond exposure and I

NOTE Confidence: 0.6888986

00:50:26.998 --> 00:50:29.910 think in terms of addressing it,

NOTE Confidence: 0.6888986

00:50:29.910 --> 00:50:31.849 I mean we have like I said,

NOTE Confidence: 0.6888986

00:50:31.850 --> 00:50:33.686 the there's this time and economic

NOTE Confidence: 0.6888986

00:50:33.686 --> 00:50:35.229 justice screening tools being used

NOTE Confidence: 0.6888986

00:50:35.229 --> 00:50:36.825 now for the Justice 40 initiative.

NOTE Confidence: 0.6888986

00:50:36.830 --> 00:50:40.064 We have EJ screen to show where

NOTE Confidence: 0.6888986

00:50:40.064 --> 00:50:41.450 these disadvantaged communities

NOTE Confidence: 0.6888986

00:50:41.523 --> 00:50:43.428 are in a nationwide basis.

NOTE Confidence: 0.6888986

00:50:43.430 --> 00:50:46.652 Some are not accounting for those

NOTE Confidence: 0.6888986

00:50:46.652 --> 00:50:48.263 that increase susceptibility,

NOTE Confidence: 0.6888986

00:50:48.270 --> 00:50:49.530 increase mortality rates,

NOTE Confidence: 0.6888986

00:50:49.530 --> 00:50:50.790 higher mortality rates,

NOTE Confidence: 0.6888986

00:50:50.790 --> 00:50:52.494 higher health outcome rates.

NOTE Confidence: 0.6888986

00:50:52.494 --> 00:50:55.050 The Cbest tool right now is.

NOTE Confidence: 0.6888986

00:50:55.050 --> 00:50:56.842 Includes poverty and one

NOTE Confidence: 0.6888986

00:50:56.842 --> 00:50:57.738 additional indicator.

NOTE Confidence: 0.6888986

00:50:57.740 --> 00:51:01.620 So that could be PM 2.5 and EJ.

NOTE Confidence: 0.6888986

00:51:01.620 --> 00:51:02.728 Screen has an index.

NOTE Confidence: 0.6888986

00:51:02.728 --> 00:51:06.139 I think if we were to use more of like that

NOTE Confidence: 0.6888986

00:51:06.139 --> 00:51:08.420 index approach that brings in poverty,

NOTE Confidence: 0.6888986

00:51:08.420 --> 00:51:10.821 brings in health and some of these

NOTE Confidence: 0.6888986

00:51:10.821 --> 00:51:12.941 other social determinants of health in

NOTE Confidence: 0.6888986

00:51:12.941 --> 00:51:14.656 addition to the pollution exposure,

NOTE Confidence: 0.6888986

00:51:14.660 --> 00:51:16.935 we can start to identify not just

NOTE Confidence: 0.6888986

00:51:16.935 --> 00:51:18.839 who is experiencing bad pollution,

NOTE Confidence: 0.6888986

00:51:18.840 --> 00:51:22.496 but who is most impacted by that bad.

NOTE Confidence: 0.6888986

00:51:22.500 --> 00:51:22.920 Thank you.

NOTE Confidence: 0.7078442

00:51:25.440 --> 00:51:27.960 Any idea what's causing the differences

NOTE Confidence: 0.7078442

00:51:27.960 --> 00:51:29.752 in disparities between cities?

NOTE Confidence: 0.694952775

00:51:29.760 --> 00:51:31.016 I'm originally from Chicago.

NOTE Confidence: 0.694952775

00:51:31.016 --> 00:51:32.272 The expressways run through

NOTE Confidence: 0.694952775

00:51:32.272 --> 00:51:33.910 black and brown neighborhoods,

NOTE Confidence: 0.694952775

00:51:33.910 --> 00:51:36.050 which is true everywhere.

NOTE Confidence: 0.694952775

00:51:36.050 --> 00:51:37.655 But disparities there,

NOTE Confidence: 0.694952775

00:51:37.660 --> 00:51:39.826 both knocks and five were fairly

NOTE Confidence: 0.694952775

00:51:39.826 --> 00:51:42.189 modest compared to the other cities.

NOTE Confidence: 0.795511673333333

00:51:43.860 --> 00:51:45.516 That's it's such a great question.

NOTE Confidence: 0.795511673333333

00:51:45.520 --> 00:51:47.592 And we now have a big project with

NOTE Confidence: 0.795511673333333

00:51:47.592 --> 00:51:49.139 an environmental Defense fund to

NOTE Confidence: 0.795511673333333

00:51:49.139 --> 00:51:50.764 dig into Chicago specifically to

NOTE Confidence: 0.795511673333333

00:51:50.764 --> 00:51:52.021 understand that because Chicago

NOTE Confidence: 0.795511673333333

00:51:52.021 --> 00:51:53.953 does have a whole lot of trucking

NOTE Confidence: 0.795511673333333

00:51:53.960 --> 00:51:55.556 that is coming through the city.

NOTE Confidence: 0.795511673333333

00:51:55.560 --> 00:51:59.536 And as you say it is associated

NOTE Confidence: 0.795511673333333

00:51:59.536 --> 00:52:01.566 geographically with with with

NOTE Confidence: 0.795511673333333

00:52:01.566 --> 00:52:03.338 black and Hispanic populations.

NOTE Confidence: 0.795511673333333

00:52:03.340 --> 00:52:05.489 There is no some other major roads

NOTE Confidence: 0.795511673333333

00:52:05.489 --> 00:52:07.882 that are more in wealthier whiter

NOTE Confidence: 0.795511673333333

00:52:07.882 --> 00:52:09.283 neighborhoods like Lakeshore

NOTE Confidence: 0.795511673333333

00:52:09.283 --> 00:52:11.151 Drive going going north.

NOTE Confidence: 0.795511673333333

00:52:11.160 --> 00:52:13.680 So when you take like an urban average.

NOTE Confidence: 0.795511673333333

00:52:13.680 --> 00:52:15.626 It also very much depends on learning.

NOTE Confidence: 0.795511673333333

00:52:15.630 --> 00:52:17.208 It very much depends on how

NOTE Confidence: 0.795511673333333

00:52:17.208 --> 00:52:18.769 you define what the city is.

NOTE Confidence: 0.795511673333333

00:52:18.770 --> 00:52:20.318 Are you looking just at Chicago,

NOTE Confidence: 0.795511673333333

00:52:20.320 --> 00:52:23.140 the entire county, entire MSA?

NOTE Confidence: 0.795511673333333

00:52:23.140 --> 00:52:25.899 And actually we've seen that the

NOTE Confidence: 0.795511673333333

00:52:25.899 --> 00:52:27.306 disparities flipped depending

NOTE Confidence: 0.795511673333333

00:52:27.306 --> 00:52:30.120 on how you define their opinion.

NOTE Confidence: 0.795511673333333

00:52:30.120 --> 00:52:31.956 More details coming soon at Chicago,

NOTE Confidence: 0.795511673333333

00:52:31.960 --> 00:52:32.940 so that's an interesting one.

NOTE Confidence: 0.84271500875

00:52:34.580 --> 00:52:37.340 Thank you so much for the fascinating part.

NOTE Confidence: 0.84271500875

00:52:37.340 --> 00:52:40.094 I just have a question about the time trends.

NOTE Confidence: 0.84271500875

00:52:40.100 --> 00:52:42.800 You showed that by racial,

NOTE Confidence: 0.84271500875

00:52:42.800 --> 00:52:47.861 ethnic of their exposure and O 2:00 PM,

NOTE Confidence: 0.84271500875

00:52:47.861 --> 00:52:51.709 but how, how does that change over time?

NOTE Confidence: 0.84271500875

00:52:51.710 --> 00:52:53.325 Is there any like convergence

NOTE Confidence: 0.84271500875

00:52:53.325 --> 00:52:54.294 across those groups?

NOTE Confidence: 0.639273194

00:52:55.860 --> 00:52:58.079 They have to share share the slides

NOTE Confidence: 0.639273194

00:52:58.079 --> 00:52:59.745 but the the project that I showed

NOTE Confidence: 0.639273194

00:52:59.745 --> 00:53:01.621 that had the PM on the left hand side

NOTE Confidence: 0.639273194

00:53:01.621 --> 00:53:03.369 and the No2 on the right hand side

NOTE Confidence: 0.639273194

00:53:03.369 --> 00:53:04.851 that showed PM mortality rates and

NOTE Confidence: 0.639273194

00:53:04.851 --> 00:53:06.646 then No2 attributable asthma rates.

NOTE Confidence: 0.639273194

00:53:06.646 --> 00:53:08.806 Those do show trends overtime

NOTE Confidence: 0.639273194

00:53:08.806 --> 00:53:10.791 and the concentrations for both

NOTE Confidence: 0.639273194

00:53:10.791 --> 00:53:13.828 PM and NS are going down for all

NOTE Confidence: 0.639273194

00:53:13.828 --> 00:53:15.880 population subgroups really great.

NOTE Confidence: 0.639273194

00:53:15.880 --> 00:53:17.664 But the relative disparities

NOTE Confidence: 0.639273194

00:53:17.664 --> 00:53:19.894 are increasing for both parents

NOTE Confidence: 0.639273194

00:53:19.894 --> 00:53:22.298 because of the like the the changes

NOTE Confidence: 0.639273194

00:53:22.298 --> 00:53:24.280 in that that overall magnitude.

NOTE Confidence: 0.639273194

00:53:24.280 --> 00:53:26.380 So the. That's this one.

NOTE Confidence: 0.639273194

00:53:26.380 --> 00:53:27.256 Thank you.

NOTE Confidence: 0.639273194

00:53:27.256 --> 00:53:28.570 So the overtime,

NOTE Confidence: 0.639273194

00:53:28.570 --> 00:53:30.900 the PM concentrations have come

NOTE Confidence: 0.639273194

00:53:30.900 --> 00:53:33.230 down approximately the same amount

NOTE Confidence: 0.639273194

00:53:33.307 --> 00:53:35.003 for all population subgroups

NOTE Confidence: 0.639273194

00:53:35.003 --> 00:53:37.547 and that leads to an increased.

NOTE Confidence: 0.639273194

00:53:37.550 --> 00:53:39.368 Ratio between the population subgroups and

NOTE Confidence: 0.639273194

00:53:39.368 --> 00:53:42.079 then for N2 this doesn't really look like it,

NOTE Confidence: 0.639273194

00:53:42.080 --> 00:53:45.509 but these orange dots are going down as well.

NOTE Confidence: 0.639273194

00:53:45.510 --> 00:53:47.402 Much greater energy reductions

NOTE Confidence: 0.639273194

00:53:47.402 --> 00:53:49.767 for the least white communities,

NOTE Confidence: 0.639273194

00:53:49.770 --> 00:53:54.410 but still we see rising ratios of

NOTE Confidence: 0.639273194

00:53:54.410 --> 00:53:57.200 disparity relative disparities.

NOTE Confidence: 0.639273194

00:53:57.200 --> 00:53:57.450 Thank

NOTE Confidence: 0.830236174166667

00:53:57.460 --> 00:53:59.716 you. The the reason I ask this is

NOTE Confidence: 0.830236174166667

00:53:59.716 --> 00:54:02.500 from the population migration and

NOTE Confidence: 0.830236174166667

00:54:02.500 --> 00:54:05.258 point of view is very mixed picture.

NOTE Confidence: 0.830236174166667

00:54:05.260 --> 00:54:08.206 The data shows that it's more

NOTE Confidence: 0.830236174166667

00:54:08.206 --> 00:54:10.668 segregation across cities unless so

NOTE Confidence: 0.830236174166667

00:54:10.668 --> 00:54:13.580 within cities in many parts of America.

NOTE Confidence: 0.830236174166667

00:54:13.580 --> 00:54:16.670 So that's interesting.

NOTE Confidence: 0.761099540833333

00:54:16.670 --> 00:54:18.105 We only looked at the the temporal

NOTE Confidence: 0.761099540833333

00:54:18.105 --> 00:54:19.479 trends and the pollution levels,

NOTE Confidence: 0.761099540833333

00:54:19.480 --> 00:54:21.436 not where where people are living,

NOTE Confidence: 0.761099540833333

00:54:21.440 --> 00:54:22.742 so that would be an interesting

NOTE Confidence: 0.761099540833333

00:54:22.742 --> 00:54:23.610 question to look into.

NOTE Confidence: 0.83376692375

00:54:25.120 --> 00:54:27.304 Uh, we we do have a comment online,

NOTE Confidence: 0.83376692375

00:54:27.310 --> 00:54:29.068 but I think it's more like

NOTE Confidence: 0.83376692375

00:54:29.068 --> 00:54:30.635 suggestion we can look at and

NOTE Confidence: 0.83376692375

00:54:30.635 --> 00:54:31.925 thank you all for coming because

NOTE Confidence: 0.83376692375

00:54:31.925 --> 00:54:33.508 we have a class right office.

NOTE Confidence: 0.83376692375

00:54:33.510 --> 00:54:34.818 So we have to end today.

NOTE Confidence: 0.83376692375

00:54:34.820 --> 00:54:36.210 Thank you all and thanks.