WEBVTT

1 00:00:00.000 --> 00:00:02.172 <v ->Everyone I think we can get started.</v>

2 00:00:02.172 --> 00:00:06.040 Today it's a very special day because today

3 00:00:06.040 --> 00:00:08.940 the Intergovernmental Panel on Climate in the House

4 00:00:08.940 --> 00:00:12.150 just released a Working Group II report,

5 00:00:12.150 --> 00:00:14.733 which is focused on climate change.

6 00:00:15.590 --> 00:00:17.230 So today we are very, very pleased

7 00:00:17.230 --> 00:00:20.980 to have Dr. Kim Knowlton joining us.

8 00:00:20.980 --> 00:00:23.520 Dr. Knowlton is a Senior Scientist

9 00:00:23.520 --> 00:00:26.800 at the National Resource Defense Council.

10 00:00:26.800 --> 00:00:30.080 She's also Assistant Professor at the Columbia University's

11 00:00:30.080 --> 00:00:31.450 Mailman School of Public Health,

12 00:00:31.450 --> 00:00:33.570 the department of Environmental Health Science.

13 00:00:33.570 --> 00:00:35.790 And she has been a senior member for

14 00:00:35.790 --> 00:00:39.550 one of the first climate health program in the country.

15 00:00:39.550 --> 00:00:42.580 So Dr. Knowlton specialize in the

16 00:00:42.580 --> 00:00:44.583 Human Health impact of climate change.

17 00:00:45.690 --> 00:00:49.010 She served as the co-convening lead author

18 00:00:49.010 --> 00:00:50.150 for the Human Health chapter

19 00:00:50.150 --> 00:00:54.870 of the US Third National Climate Assessment,

20 00:00:54.870 --> 00:00:57.000 as a member of the second and fourth

21 00:00:57.000 --> 00:00:59.720 New York City Panels on Climate Change.

22 00:00:59.720 --> 00:01:03.773 And participated in the IIPCC's fourth analytics reports.

23 00:01:04.660 --> 00:01:07.750 Her work with the New York's Climate and Health project,

24 00:01:07.750 --> 00:01:10.260 which you will hear about later,

25 00:01:10.260 --> 00:01:14.010 describe some of the very first down skilled

26 00:01:14.010 --> 00:01:15.470 global to regional climate

27 00:01:15.470 --> 00:01:18.210 and health access modeling in the US

28 00:01:18.210 --> 00:01:20.910 which to me is also one my,

29 00:01:20.910 --> 00:01:24.750 the kind which inspires me

30 00:01:24.750 --> 00:01:29.730 to do my PhD thesis on this topic.

31 00:01:29.730 --> 00:01:34.270 So I'm very pleased to welcome Dr. Kim Knowlton.

32 00:01:35.310 --> 00:01:36.430 <v ->Thank you, Kai.</v>

33 00:01:36.430 --> 00:01:39.400 You are so kind and thanks to you and Mauro

34 00:01:39.400 --> 00:01:43.010 for helping with the technology

35 00:01:43.010 --> 00:01:44.070 and just for the invitation

36 00:01:44.070 --> 00:01:45.630 and really everyone in the room

37 00:01:45.630 --> 00:01:48.400 on such an auspicious news day.

38 00:01:48.400 --> 00:01:50.770 As Kai said, it's just huge.

39 00:01:50.770 --> 00:01:53.310 I am really honored that you are taking some time

40 00:01:53.310 --> 00:01:56.680 to be here with me and us talking about

41 00:01:56.680 --> 00:01:59.330 climate change and how it affects people's health,

42 00:01:59.330 --> 00:02:01.650 certainly a topic near and dear to my heart.

43 00:02:01.650 --> 00:02:05.170 And this is gonna be, I think a pretty personal

44 00:02:07.160 --> 00:02:08.640 conversation with you.

45 00:02:08.640 --> 00:02:10.340 I'm not representing, you know,

46 00:02:10.340 --> 00:02:14.010 NRDC or Columbia University officially.

47 00:02:14.010 --> 00:02:17.470 I'm gonna tell you some things about my personal experiences

48 00:02:17.470 --> 00:02:21.110 in this field as Kai said.

49 00:02:21.110 --> 00:02:23.860 From some pretty early days in the climate and

50 00:02:23.860 --> 00:02:28.510 health world and to where I am now as a scientist advocate,

51 00:02:28.510 --> 00:02:31.730 still at the Natural Resources Defense Council,

52 00:02:31.730 --> 00:02:34.350 most of my time and still at Columbia,

53 00:02:34.350 --> 00:02:36.980 but I hope that I'll talk a little bit,

54 00:02:36.980 --> 00:02:38.870 give you a sense of my slow conversion

55 00:02:38.870 --> 00:02:43.190 from someone who probably somewhat idealistically

56 00:02:43.190 --> 00:02:45.360 and blindly thought data.

57 00:02:45.360 --> 00:02:46.540 It's all about data.

58 00:02:46.540 --> 00:02:50.710 Once I can do, or someone can do a great study

59 00:02:50.710 --> 00:02:53.030 and just bring forward those connections

60 00:02:53.030 --> 00:02:55.460 between climate change and health that'll be it.

61 00:02:55.460 --> 00:02:57.400 Then we'll just march into, you know,

62 00:02:57.400 --> 00:03:00.240 climate policy and health protections and all will be well.

63 00:03:00.240 --> 00:03:04.700 Well, I'm a firm believer but it takes a lot more than that

64 00:03:04.700 --> 00:03:06.630 as we all see from our experience

65 00:03:06.630 --> 00:03:10.610 and I'm gonna try and save time at the end for

66 00:03:10.610 --> 00:03:12.970 a lot of discussion time between us too.

67 00:03:12.970 --> 00:03:17.780 So thank you, Mauro and Kai for keeping me honest on that.

68 00:03:17.780 --> 00:03:20.510 So I'll give you a tidbits about what I've experienced

69 00:03:20.510 --> 00:03:23.033 along the way as we go.

70 00:03:25.320 --> 00:03:26.780 Most of my time now

71 00:03:26.780 --> 00:03:30.110 is spent at the Natural Resources Defense Council,

72 00:03:30.110 --> 00:03:32.160 an environmental not for profit

73 00:03:32.160 --> 00:03:34.870 that was established more than 50 years ago

74 00:03:34.870 --> 00:03:38.630 by a group of young attorneys who had the idea

75 00:03:38.630 --> 00:03:42.560 that they would use the environment as their client.

76 00:03:42.560 --> 00:03:45.800 Environmental law didn't even exist as a field then.

77 00:03:45.800 --> 00:03:47.400 And we have since that time,

78 00:03:47.400 --> 00:03:50.090 pretty much kept the same mission statement.

79 00:03:50.090 --> 00:03:51.420 And it's a big one.

80 00:03:51.420 --> 00:03:53.450 It's a little bit ambitious to protect the earth,

81 00:03:53.450 --> 00:03:55.680 the wild places, the people,

82 00:03:55.680 --> 00:03:57.430 the health of all those systems,

83 00:03:57.430 --> 00:04:00.850 and to ensure people's right to clean and healthy air,

84 00:04:00.850 --> 00:04:03.130 water, land and the wild.

85 00:04:03.130 --> 00:04:06.640 So, climate change and climate policy is really...

86 00:04:06.640 --> 00:04:09.230 If one had to pick one,

87 00:04:09.230 --> 00:04:14.230 it would be overarching, you know, theme that we work on.

88 00:04:14.630 --> 00:04:16.740 So, it has sure been a challenge,

89 00:04:16.740 --> 00:04:21.700 but I'm so happy, satisfied, learn something,

90 00:04:21.700 --> 00:04:26.680 many things every day at this advocacy organization

91 00:04:26.680 --> 00:04:29.510 working as I do in the health frame.

92 00:04:29.510 --> 00:04:30.610 So let's get started.

93 00:04:30.610 --> 00:04:32.270 Next slide please.

94 00:04:32.270 --> 00:04:34.960 So this is a representation of me

95 00:04:34.960 --> 00:04:38.580 connecting the dots between climate change and health.

96 00:04:38.580 --> 00:04:42.940 I started actually as a geologist, I like those big systems.

97 00:04:42.940 --> 00:04:46.320 I loved earth systems and learning about

98 00:04:46.320 --> 00:04:49.950 how human activities affect the earth

99 00:04:49.950 --> 00:04:51.790 and the environment and vice versa.

100 00:04:51.790 --> 00:04:56.010 How environmental change affects our health.

101 00:04:56.010 --> 00:04:59.750 I was very influenced by some work I did on

102 00:04:59.750 --> 00:05:02.200 radioactive waste management.

103 00:05:02.200 --> 00:05:04.420 I worked at a group that was

104 00:05:04.420 --> 00:05:06.490 kind of the counterpart of the nuclear industry.

105 00:05:06.490 --> 00:05:10.250 We would try and find potential areas of concern

106 00:05:10.250 --> 00:05:12.130 and license applications that

107 00:05:12.130 --> 00:05:14.130 proposed radioactive waste sites.

108 00:05:14.130 --> 00:05:16.540 And there were a group of activists

109 00:05:16.540 --> 00:05:20.420 at a site we were working with in West Texas

110 00:05:20.420 --> 00:05:24.440 who impressed me mightily with their ability to

111 00:05:24.440 --> 00:05:28.380 link this environmental change to local health.

112 00:05:28.380 --> 00:05:31.540 We can't have this rad waste facility here

113 00:05:31.540 --> 00:05:34.050 because the groundwater will bring it into our town,

114 00:05:34.050 --> 00:05:35.663 you know, the radionuclides.

115 00:05:36.920 --> 00:05:39.720 Contamination and no, we can't have it.

116 00:05:39.720 --> 00:05:43.220 And they were successful and powerful, small but mighty

117 00:05:43.220 --> 00:05:45.600 and I thought that's quite interesting.

118 00:05:45.600 --> 00:05:47.410 I would like to study that.

119 00:05:47.410 --> 00:05:50.800 So I ended up going back to school

120 00:05:50.800 --> 00:05:53.580 to City University in New York City

121 00:05:53.580 --> 00:05:56.700 and then to Columbia University

122 00:05:56.700 --> 00:06:00.840 where I got so many lucky breaks.

123 00:06:00.840 --> 00:06:02.860 I was lucky enough to be part of the

124 00:06:02.860 --> 00:06:04.940 New York Climate and Health Project.

125 00:06:04.940 --> 00:06:06.170 Next slide, please.

126 00:06:06.170 --> 00:06:08.410 I'll tell you a little bit about that.

127 00:06:08.410 --> 00:06:13.050 This was funded by the Environmental Protection Agency's,

128 00:06:13.050 --> 00:06:15.930 STAR grants Science To Achieve Results.

129 00:06:15.930 --> 00:06:19.510 It was really one of the first big US-based

130 00:06:19.510 --> 00:06:23.020 integrated assessment modeling projects

131 00:06:23.020 --> 00:06:24.940 and kind of funding proposals.

132 00:06:24.940 --> 00:06:28.210 So, we had global climate modelers

133 00:06:28.210 --> 00:06:31.270 who fed their information to regional climate modelers

134 00:06:31.270 --> 00:06:33.370 who worked with land use modelers.

135 00:06:33.370 --> 00:06:36.140 Then there was an atmosphere chemistry model

136 00:06:36.140 --> 00:06:38.270 that sort of used all those inputs

137 00:06:38.270 --> 00:06:41.520 and kind of at the end of this interconnected chain

138 00:06:41.520 --> 00:06:44.090 was the health risk assessment.

139 00:06:44.090 --> 00:06:47.890 Dr. Patrick Kinney who was my research mentor,

140 00:06:47.890 --> 00:06:49.930 he's now at Boston University.

141 00:06:49.930 --> 00:06:54.400 He has been continues to be a leading light

142 00:06:54.400 --> 00:06:56.030 in the climate and health field.

143 00:06:56.030 --> 00:06:58.530 And he gave me lots of opportunities,

144 00:06:58.530 --> 00:07:00.337 including when he shattered across the classroom.

145 00:07:00.337 --> 00:07:03.490 "Hey Kim, are you still looking for a dissertation topic?"

146 00:07:03.490 --> 00:07:04.700 I said, "Yes, I am."

147 00:07:04.700 --> 00:07:07.690 The one that I had in mind about radioactive waste

148 00:07:07.690 --> 00:07:10.160 was not taking shape.

149 00:07:10.160 --> 00:07:11.770 So I jumped on board,

150 00:07:11.770 --> 00:07:13.570 the climate and health train,

151 00:07:13.570 --> 00:07:18.490 which in 2000 was kind of new and I jumped on forward

152 00:07:18.490 --> 00:07:19.610 and off we went.

153 00:07:19.610 --> 00:07:20.773 Next slide, please.

154 00:07:22.640 --> 00:07:24.560 That job of connecting the dots between

155 00:07:24.560 --> 00:07:27.400 climate change and our health was...

156 00:07:27.400 --> 00:07:28.780 I mean, in the research community,

157 00:07:28.780 --> 00:07:30.460 it was starting to grow,

158 00:07:30.460 --> 00:07:31.980 but kind of in the community at large,

159 00:07:31.980 --> 00:07:33.830 it was an absolutely new idea.

160 00:07:33.830 --> 00:07:35.530 And I have to say,

161 00:07:35.530 --> 00:07:39.520 20 years later, it still is a constant conversation,

162 00:07:39.520 --> 00:07:42.330 not only does climate change affect the environment

163 00:07:42.330 --> 00:07:47.330 and the Arctic and polar bears and like nonhuman faces.

164 00:07:47.850 --> 00:07:49.340 It also affects people

165 00:07:49.340 --> 00:07:51.780 and some people far, far more than others.

166 00:07:51.780 --> 00:07:55.420 So, this is an old chestnut

167 00:07:55.420 --> 00:07:59.030 something from a article from the "New York Times" in 2003,

168 00:07:59.030 --> 00:08:02.920 the introduced this project that looked at the

169 00:08:02.920 --> 00:08:04.950 New York City Tri-state area,

170 00:08:04.950 --> 00:08:08.620 31 counties in New York, New Jersey, Connecticut,

171 00:08:08.620 --> 00:08:11.530 and the novel thing then

172 00:08:11.530 --> 00:08:13.180 about the New York Climate and Health project

173 00:08:13.180 --> 00:08:15.570 was health was the driver.

174 00:08:15.570 --> 00:08:17.330 At the end of that cascade,

175 00:08:17.330 --> 00:08:20.140 who was going to estimate the impacts

176 00:08:20.140 --> 00:08:23.000 to the health of people in New York city?

177 00:08:23.000 --> 00:08:24.780 Who was gonna be specific to New York?

178 00:08:24.780 --> 00:08:26.420 Who was gonna look into the future?

179 00:08:26.420 --> 00:08:28.440 At the time, these were new ideas.

180 00:08:28.440 --> 00:08:32.080 In this image you see Dr. Cynthia Rosenzweig

181 00:08:32.080 --> 00:08:34.950 who worked at NASA GISS,

182 00:08:34.950 --> 00:08:38.100 with Jim Hansen, who was one of the, you know,

183 00:08:38.100 --> 00:08:41.250 like the pioneers of this whole impacts

184 00:08:41.250 --> 00:08:42.753 in climate change field.

185 00:08:43.640 --> 00:08:45.290 At the table you see yours truly

186 00:08:45.290 --> 00:08:47.160 on the left and Pat Kinney

187 00:08:47.160 --> 00:08:51.670 Cynthia again Joyce Rosenthal, who is a urban planner,

188 00:08:51.670 --> 00:08:52.680 worked in public health.

189 00:08:52.680 --> 00:08:55.150 So, this was like the beginning,

190 00:08:55.150 --> 00:08:58.000 the blossoming of a really interdisciplinary team

191 00:08:58.000 --> 00:08:59.493 or transdisciplinary.

192 00:09:00.400 --> 00:09:01.963 Next slide, please.

193 00:09:03.170 --> 00:09:06.240 And it was, and it still remained somewhat challenging

194 00:09:06.240 --> 00:09:09.360 to find the space, to find the funding,

195 00:09:09.360 --> 00:09:10.730 to find the journals,

196 00:09:10.730 --> 00:09:12.623 to find the academic appointments.

197 00:09:13.650 --> 00:09:17.350 That kind of foster and feed interdisciplinary work.

198 00:09:17.350 --> 00:09:18.860 But there's been, you know,

199 00:09:18.860 --> 00:09:21.970 lots of progress in the years in between.

200 00:09:21.970 --> 00:09:24.100 It's been a challenge, but a good one.

201 00:09:24.100 --> 00:09:27.150 We would meet every week for three years

202 00:09:27.150 --> 00:09:30.290 that was the term of the NYCHP as we call it

203 00:09:31.220 --> 00:09:35.250 every week to learn each other's jargon and language.

204 00:09:35.250 --> 00:09:37.060 And how do you do your modeling?

205 00:09:37.060 --> 00:09:39.280 We really had to come up with

206 00:09:39.280 --> 00:09:43.410 over that time a shared language, a shared vocabulary,

207 00:09:43.410 --> 00:09:46.320 so that we could put together link these models.

208 00:09:46.320 --> 00:09:49.630 And these are some of the images from the

209 00:09:49.630 --> 00:09:52.920 more than a dozen peer review journal papers,

210 00:09:52.920 --> 00:09:55.890 eventually that came out of the project.

211 00:09:55.890 --> 00:09:59.030 So it was a very rich project

212 00:09:59.030 --> 00:10:01.230 and you can see here kind of the,

213 00:10:01.230 --> 00:10:05.070 some of the images that represent those different sectors

214 00:10:05.070 --> 00:10:08.340 whose climate impacts are being modeled.

215 00:10:08.340 --> 00:10:12.500 In the upper left is I believe that's looks like from the

216 00:10:14.510 --> 00:10:17.840 model resolution global climate change

217 00:10:17.840 --> 00:10:21.140 that was dynamically down-scaled

218 00:10:21.140 --> 00:10:23.983 to regional climate model temperature.

219 00:10:24.870 --> 00:10:26.910 On the upper right you see the results

220 00:10:26.910 --> 00:10:30.630 of the atmospheric chemistry modeling component

221 00:10:30.630 --> 00:10:33.916 that Christian Hogrefe at the University of Albany

222 00:10:33.916 --> 00:10:37.770 did beautiful work with his colleagues there.

223 00:10:37.770 --> 00:10:41.000 Sort of below that the lower right is

224 00:10:41.000 --> 00:10:44.870 a figure from a paper that I was lucky enough

225 00:10:44.870 --> 00:10:45.910 to leave the team...

226 00:10:45.910 --> 00:10:47.060 This is all teamwork.

227 00:10:47.060 --> 00:10:48.790 You know, none of it is singular.

228 00:10:48.790 --> 00:10:50.885 But it was really one of the first times

229 00:10:50.885 --> 00:10:54.600 that people who live in a region in the US

230 00:10:54.600 --> 00:10:55.740 could look at their county.

231 00:10:55.740 --> 00:10:59.107 Those are counties that are kind of at outlined and say,

232 00:10:59.107 --> 00:11:01.897 ”Hey, in some future year there's gonna be

233 00:11:01.897 --> 00:11:04.743 ”an increase in premature mortality here.”

234 00:11:04.743 --> 00:11:06.280 It's gonna be how much hotter.

235 00:11:06.280 --> 00:11:09.260 I think that this was kind of the beginning of that

236 00:11:09.260 --> 00:11:12.321 geographic specificity that has become

237 00:11:12.321 --> 00:11:14.740 quite a powerful way to use data.

238 00:11:14.740 --> 00:11:18.870 And in the lower left here is some land use change modeling.

239 00:11:18.870 --> 00:11:23.870 We look forward to the 2020s, 2050s and 2080s.

240 00:11:24.210 --> 00:11:25.260 Next slide, please.

241 00:11:25.260 --> 00:11:28.050 This is just a little bit of a zoom in.

242 00:11:28.050 --> 00:11:29.696 And I know Kai that

243 00:11:29.696 --> 00:11:32.410 you like this paper and wanted me to talk about it.

244 00:11:32.410 --> 00:11:33.458 So here we are.

245 00:11:33.458 --> 00:11:38.458 These show, the estimates of percent increases in summer

246 00:11:38.460 --> 00:11:40.940 ozone related premature mortality

247 00:11:40.940 --> 00:11:45.030 look into the 2050s relative to the 1990s baseline.

248 00:11:45.030 --> 00:11:48.140 So here again, you just get the sense of the,

249 00:11:48.140 --> 00:11:50.630 kind of the original in my backyard.

250 00:11:50.630 --> 00:11:51.680 Hey, that's my county.

251 00:11:51.680 --> 00:11:53.610 Hey, that's where my aunt Sharon lives

252 00:11:53.610 --> 00:11:56.260 that came out of New York Climate and Health Project,

253 00:11:56.260 --> 00:11:59.150 which I think was part of why

254 00:11:59.150 --> 00:12:02.150 it created a foundation for other papers.

255 00:12:02.150 --> 00:12:04.700 What we found that was that overall

256 00:12:04.700 --> 00:12:08.950 there was a median 4.5% increased region-wide

257 00:12:08.950 --> 00:12:13.370 by the 2050s in that ozone related pre-mature mortality.

258 00:12:13.370 --> 00:12:14.323 Next slide, please.

259 00:12:15.960 --> 00:12:17.210 Kai created this.

260 00:12:17.210 --> 00:12:18.900 Thank you very much for that.

261 00:12:18.900 --> 00:12:23.620 But it gives a sense of how the work

262 00:12:23.620 --> 00:12:25.063 of the New York Climate Health Project

263 00:12:25.063 --> 00:12:27.620 was useful in other papers

264 00:12:27.620 --> 00:12:30.640 that since have gone on to go much further

265 00:12:30.640 --> 00:12:32.860 looking at how climate change

266 00:12:32.860 --> 00:12:35.290 affects air quality and then mortality.

267 00:12:35.290 --> 00:12:37.680 We know that ground level ozone

268 00:12:37.680 --> 00:12:40.550 it's a temperature and sunlight sensitive

269 00:12:40.550 --> 00:12:42.980 formation chemistry reaction.

270 00:12:42.980 --> 00:12:46.270 So that's part of why climate change in particular

271 00:12:46.270 --> 00:12:50.210 will serve to, you know, other things held constant,

272 00:12:50.210 --> 00:12:55.210 make it more challenging to meet ozone regulations

273 00:12:55.300 --> 00:12:58.450 and will tend to increase ozone concentrations.

274 00:12:58.450 --> 00:13:00.000 Actually, the work of Michelle Bell

275 00:13:00.000 --> 00:13:02.570 who's one of the faculty members at Yale

276 00:13:02.570 --> 00:13:05.760 was also really instrumental in understanding

277 00:13:05.760 --> 00:13:09.320 this kind of regional and super regional effect.

278 00:13:09.320 --> 00:13:13.210 She was lead author on a paper and climatic change

279 00:13:13.210 --> 00:13:16.886 that found estimated that there will be a 68% increase

280 00:13:16.886 --> 00:13:21.150 in ozone exceeded days by the 2050s.

281 00:13:21.150 --> 00:13:24.230 That is days that don't meet the eight hour standard.

282 00:13:24.230 --> 00:13:26.290 So this was some of the first times that we,

283 00:13:26.290 --> 00:13:30.507 people really got a chance to like vibe that,

284 00:13:30.507 --> 00:13:32.667 "Hey, in my backyard where I live

285 00:13:32.667 --> 00:13:34.810 "climate change could affect my health."

286 00:13:34.810 --> 00:13:37.460 Because as we know, there's 25 million people,

287 00:13:37.460 --> 00:13:40.800 adults and children in the US that have asthma

288 00:13:40.800 --> 00:13:44.010 ozone can be a trigger for asthma attack.

289 00:13:44.010 --> 00:13:47.400 There's all kinds of reasons why this is important.

290 00:13:47.400 --> 00:13:51.760 There was also a companion paper on heat.

291 00:13:51.760 --> 00:13:54.720 And heat related premature mortality that came out

292 00:13:54.720 --> 00:13:56.840 of the New York Climate and Health Project

293 00:13:56.840 --> 00:13:59.190 that gave a view to, you know,

294 00:13:59.190 --> 00:14:01.030 increases by the 2050s,

295 00:14:01.030 --> 00:14:05.620 like a 70% increase in premature heat related mortality.

296 00:14:05.620 --> 00:14:09.640 By the 2080s, a tripling in the New York Metro region.

297 00:14:09.640 --> 00:14:11.120 So in a lot of ways,

298 00:14:11.120 --> 00:14:14.220 it put ozone and air quality and heat on the

299 00:14:15.330 --> 00:14:20.180 New York Metro, I think, you know, sites for future work.

300 00:14:20.180 --> 00:14:21.680 Next slide, please.

301 00:14:21.680 --> 00:14:24.340 I'm gonna transition a little bit to

302 00:14:26.400 --> 00:14:28.380 the storytelling aspect,

303 00:14:28.380 --> 00:14:32.670 which has been a big feature of my work at NRDC.

304 00:14:34.360 --> 00:14:35.730 As Cynthia Rosenzweig

305 00:14:37.427 --> 00:14:39.880 from climate and health projects said wisely,

306 00:14:39.880 --> 00:14:42.880 she called it the four Ps at the time,

307 00:14:42.880 --> 00:14:46.430 which meant for her that proposals, you know,

308 00:14:46.430 --> 00:14:48.810 research proposals, lead to projects

309 00:14:48.810 --> 00:14:50.920 which lead to papers,

310 00:14:50.920 --> 00:14:53.280 but then they very much influence policy.

311 00:14:53.280 --> 00:14:56.140 And I would add people

312 00:14:56.140 --> 00:14:59.560 that you can't have those influences on policy

313 00:14:59.560 --> 00:15:02.300 kind of flowing from the data without people

314 00:15:02.300 --> 00:15:03.570 to make it happen.

315 00:15:03.570 --> 00:15:05.210 And then for better or worse,

316 00:15:05.210 --> 00:15:08.570 the another P kind of the six P is politics.

317 00:15:08.570 --> 00:15:11.980 These are all issues of some science and health science

318 00:15:13.290 --> 00:15:16.480 that have become as we know, so politicized

319 00:15:16.480 --> 00:15:19.220 in the years since and to this very day.

320 00:15:19.220 --> 00:15:22.490 So, local stories help fuel advocacy.

321 00:15:22.490 --> 00:15:24.360 And next slide, please.

322 00:15:24.360 --> 00:15:28.660 It's my hope, my belief that

323 00:15:28.660 --> 00:15:31.410 with health climate change becomes very personal

324 00:15:31.410 --> 00:15:32.700 and that it can help motivate

325 00:15:32.700 --> 00:15:35.080 that kind of health protective advocacy.

326 00:15:35.080 --> 00:15:36.400 I'm showing this because

327 00:15:37.250 --> 00:15:39.070 this was a study conducted with the

328 00:15:39.070 --> 00:15:41.380 California Department of Public Health

329 00:15:41.380 --> 00:15:44.750 and some NRDC scientists, myself included

330 00:15:44.750 --> 00:15:47.160 that was published in 2009

331 00:15:47.160 --> 00:15:49.010 in Environmental Health Perspectives.

332 00:15:49.010 --> 00:15:52.010 It was really one of the first US-based studies

333 00:15:52.010 --> 00:15:55.240 that looked at a big heat wave and its impact,

334 00:15:55.240 --> 00:15:57.300 not a premature mortality,

335 00:15:57.300 --> 00:16:00.290 but a morbidity on different illnesses,

336 00:16:00.290 --> 00:16:04.030 emergency room visits, hospitalizations in a big state.

337 00:16:04.030 --> 00:16:05.890 This is California.

338 00:16:05.890 --> 00:16:07.390 You can see the counties on there,

339 00:16:07.390 --> 00:16:12.170 but these are kind of climatic zones in California.

340 00:16:12.170 --> 00:16:14.623 There was a two week heat wave in 2006.

341 00:16:14.623 --> 00:16:17.130 That was really intense,

342 00:16:17.130 --> 00:16:19.880 had a really large geographic extent.

343 00:16:19.880 --> 00:16:24.390 And what this work found was to our surprise somewhat.

344 00:16:24.390 --> 00:16:25.470 There was a huge...

345 00:16:25.470 --> 00:16:27.010 I mean, you expect that there would be

346 00:16:27.010 --> 00:16:30.690 an increase in excess emergency room visits,

347 00:16:30.690 --> 00:16:31.630 but it was enormous.

348 00:16:31.630 --> 00:16:36.550 It was over 16,000 additional excess ER visits

349 00:16:36.550 --> 00:16:39.370 beyond what would typically be expected

350 00:16:40.220 --> 00:16:41.773 at that season of the year.

351 00:16:42.760 --> 00:16:46.740 There were almost 1200 excess hospitalizations,

352 00:16:46.740 --> 00:16:49.670 and you can see from this figure that

353 00:16:49.670 --> 00:16:52.350 the Central Coast region was just on the Western

354 00:16:52.350 --> 00:16:54.050 and Central Coast includes

355 00:16:54.050 --> 00:16:55.990 the San Francisco Bay Area.

356 00:16:55.990 --> 00:16:59.320 Well the temperatures there were not in an absolute sense,

357 00:16:59.320 --> 00:17:01.340 the hottest temperatures on the state,

358 00:17:01.340 --> 00:17:04.990 the relative risk was very high.

359 00:17:04.990 --> 00:17:07.570 And that is because the population there,

360 00:17:07.570 --> 00:17:09.120 the infrastructure, the residents

361 00:17:09.120 --> 00:17:13.110 are not a climatized are not prepared for intense heat.

362 00:17:13.110 --> 00:17:15.930 There's a lot of resident that don't have air conditioning.

363 00:17:15.930 --> 00:17:18.960 So, this was an interesting study.

364 00:17:18.960 --> 00:17:21.850 Another one that's been helpful to other people doing

365 00:17:21.850 --> 00:17:23.940 heat morbidity work.

366 00:17:23.940 --> 00:17:27.590 But it was also interesting because our partnership

367 00:17:27.590 --> 00:17:32.300 with the State Department of Health was really fruitful.

368 00:17:32.300 --> 00:17:35.240 We, as an NGO, as a nonprofit,

369 00:17:35.240 --> 00:17:39.400 as an advocacy organization could be kinda more forward

370 00:17:39.400 --> 00:17:41.780 and more direct with some of the messaging

371 00:17:41.780 --> 00:17:43.010 coming out of this

372 00:17:43.010 --> 00:17:47.830 and they had the, you know, the de-identified data,

373 00:17:47.830 --> 00:17:50.600 the statistical analysts,

374 00:17:50.600 --> 00:17:53.380 it was a great kind of marriage of skills

375 00:17:53.380 --> 00:17:57.260 and I think that that is part of,

376 00:17:57.260 --> 00:17:58.560 I mean, my message to us.

377 00:17:58.560 --> 00:18:01.410 We all have a role in what we're trying to achieve

378 00:18:01.410 --> 00:18:04.480 in the way of both learning and taking our learnings

379 00:18:04.480 --> 00:18:07.890 to a wider audience both public and policy making

380 00:18:07.890 --> 00:18:10.420 to get the heck on board

381 00:18:10.420 --> 00:18:14.240 with more health protective climate policy.

382 00:18:14.240 --> 00:18:16.540 Government agencies have a critical role

383 00:18:16.540 --> 00:18:18.990 and geoscientists have a critical role,

384 00:18:18.990 --> 00:18:22.270 you academic scientists have a critical role

385 00:18:22.270 --> 00:18:23.780 as do lots of other people,

386 00:18:23.780 --> 00:18:26.720 artists, writers, musicians,

387 00:18:26.720 --> 00:18:30.420 the people, children, elders, you know, community groups,

388 00:18:30.420 --> 00:18:31.990 we're all in this thing together.

389 00:18:31.990 --> 00:18:35.160 So a little bit of my pitch for it takes a village,

390 00:18:35.160 --> 00:18:36.533 but next slide please.

391 00:18:37.730 --> 00:18:40.510 To continue on that theme of

392 00:18:40.510 --> 00:18:42.530 like making global climate change,

393 00:18:42.530 --> 00:18:45.690 which can be sometimes rather abstract

394 00:18:45.690 --> 00:18:48.600 or rather, let's say abstract now

395 00:18:48.600 --> 00:18:50.850 after the last 10 years, that for sure.

396 00:18:50.850 --> 00:18:54.040 But it can seem rather large scale

397 00:18:54.040 --> 00:18:57.946 and I have found in my time at NRDC

398 00:18:57.946 --> 00:19:00.283 and working with partners there in particular,

399 00:19:01.380 --> 00:19:06.020 that making that global story local is hugely important.

400 00:19:06.020 --> 00:19:07.570 It brings it closer to home.

401 00:19:07.570 --> 00:19:10.120 It reflects people's lived experience

402 00:19:10.120 --> 00:19:11.650 from media point of view

403 00:19:11.650 --> 00:19:14.570 because working with the media successfully

404 00:19:14.570 --> 00:19:18.270 is important to get our science and our data

405 00:19:18.270 --> 00:19:20.300 out into the public sphere.

406 00:19:20.300 --> 00:19:21.960 Is great because if I do,

407 00:19:21.960 --> 00:19:24.440 as I have with, you know, my partners and colleagues,

408 00:19:24.440 --> 00:19:26.100 you see here in the map below,

409 00:19:26.100 --> 00:19:28.350 which I'll talk about a little bit more,

410 00:19:28.350 --> 00:19:32.240 we typically at NRDC use existing data sets,

411 00:19:32.240 --> 00:19:35.610 but try to put them together in novel ways

412 00:19:35.610 --> 00:19:38.010 that tell a health relevant story.

413 00:19:38.010 --> 00:19:42.040 And when we do that on a national scale,

414 00:19:42.040 --> 00:19:43.600 like the map you see here,

415 00:19:43.600 --> 00:19:46.590 it means that news outlets and people

416 00:19:46.590 --> 00:19:49.890 and local newspapers in every one of those counties

417 00:19:49.890 --> 00:19:51.047 can look at the map and say,

418 00:19:51.047 --> 00:19:52.840 ”Hey, what's this story?”

419 00:19:52.840 --> 00:19:54.790 And we work with them to try and

420 00:19:54.790 --> 00:19:57.260 bring that local story to the fore.

421 00:19:57.260 --> 00:20:02.260 These are two URLs for some of the websites that NRDC

422 00:20:03.580 --> 00:20:08.580 still has that combine not only mapping tools like this,

423 00:20:08.890 --> 00:20:10.920 but also some of the information on

424 00:20:10.920 --> 00:20:13.060 the impacts writ large for people.

425 00:20:13.060 --> 00:20:16.680 And there's a lot of people who haven't been introduced

426 00:20:16.680 --> 00:20:19.283 to the connection between climate change and health.

427 00:20:20.280 --> 00:20:24.260 We also try to show preparedness and adaptation

428 00:20:24.260 --> 00:20:29.220 and action steps that are happening locally at the state,

429 00:20:29.220 --> 00:20:30.780 even at the local level,

430 00:20:30.780 --> 00:20:33.540 to give people a sense of what can do

431 00:20:33.540 --> 00:20:35.020 and see themselves in a kind of

432 00:20:35.020 --> 00:20:37.170 action frame in this story.

433 00:20:37.170 --> 00:20:38.403 Next slide please.

434 00:20:39.450 --> 00:20:42.360 While those two URLs are still current,

435 00:20:42.360 --> 00:20:45.180 I just wanted to take a little spin down memory lane

436 00:20:45.180 --> 00:20:50.180 for me at least and show you how the online maps evolve.

437 00:20:51.740 --> 00:20:53.970 We've gotten a lot of very positive feedback

438 00:20:53.970 --> 00:20:54.973 through the years.

439 00:20:54.973 --> 00:20:55.910 It was like 2011.

440 00:20:55.910 --> 00:20:58.370 It's been a decade little bit more.

441 00:20:58.370 --> 00:20:59.630 Yeah, a little bit more than decades

442 00:20:59.630 --> 00:21:02.500 since those maps first came out.

443 00:21:02.500 --> 00:21:07.500 And this is the URL for the original site climate maps.

444 00:21:07.970 --> 00:21:11.540 We made a large effort to bring together that statewide

445 00:21:11.540 --> 00:21:14.350 and then county level information.

446 00:21:14.350 --> 00:21:17.830 In that original site, we had more maps actually.

447 00:21:17.830 --> 00:21:20.280 We had showed air quality,

448 00:21:20.280 --> 00:21:23.670 how climate change affects environmental change

449 00:21:23.670 --> 00:21:28.270 and then related to health outcomes for air quality,

450 00:21:28.270 --> 00:21:32.210 extreme weather events, drought, flooding,

451 00:21:32.210 --> 00:21:37.170 extreme heat, one infectious disease, dengue fever.

452 00:21:37.170 --> 00:21:39.230 So we tried to put the information there.

453 00:21:39.230 --> 00:21:40.900 Next slide please.

454 00:21:40.900 --> 00:21:45.740 And we gave people a way to not only see the threat

455 00:21:45.740 --> 00:21:48.300 that shows what it used to look like.

456 00:21:48.300 --> 00:21:51.870 Our website has been streamlined by much better designers.

457 00:21:51.870 --> 00:21:54.490 Well, you know, better designers let's say

458 00:21:54.490 --> 00:21:55.970 certainly better than me.

459 00:21:55.970 --> 00:21:57.477 We also blog a lot.

460 00:21:57.477 --> 00:22:01.040 Our scientists, our policy experts blog.

461 00:22:01.040 --> 00:22:03.410 So they were all collected on the pages.

462 00:22:03.410 --> 00:22:05.170 Next slide please.

463 00:22:05.170 --> 00:22:08.110 And we felt it was important to give people

464 00:22:08.110 --> 00:22:11.860 that sense of what they can do, like preparedness actions.

465 00:22:11.860 --> 00:22:12.930 It's just frustrating

466 00:22:12.930 --> 00:22:15.363 and, you know, frankly can lead to a sense of,

467 00:22:16.400 --> 00:22:17.980 you know, a lack of agency

468 00:22:17.980 --> 00:22:20.990 to give people somewhat alarming

469 00:22:20.990 --> 00:22:22.130 health concerning news

470 00:22:22.130 --> 00:22:25.170 and not, you know, show a way to move their concern

471 00:22:25.170 --> 00:22:27.270 into action and movement.

472 00:22:27.270 --> 00:22:28.440 So we did try to do that.

473 00:22:28.440 --> 00:22:31.500 So this is just kind of sharing with you

474 00:22:31.500 --> 00:22:33.280 our thought process.

475 00:22:33.280 --> 00:22:37.090 It began the map series as a poster session,

476 00:22:37.090 --> 00:22:38.360 internal to NRDC.

477 00:22:38.360 --> 00:22:41.050 We got a lot of feedback from our colleagues

478 00:22:41.050 --> 00:22:43.870 and we took some time and we turned it into

479 00:22:43.870 --> 00:22:45.420 these online maps.

480 00:22:45.420 --> 00:22:49.000 Have since kind of maintained and sustained themselves

481 00:22:49.000 --> 00:22:52.130 as one of the most popular of NRDCS web pages.

482 00:22:52.130 --> 00:22:55.260 And we've gotten great feedback that they're great screening

483 00:22:55.260 --> 00:22:57.820 tools for local planners.

484 00:22:57.820 --> 00:23:01.400 Students have used them to inform their local work.

485 00:23:01.400 --> 00:23:04.100 So we're glad that they met with success.

486 00:23:04.100 --> 00:23:05.770 Next slide please.

487 00:23:05.770 --> 00:23:08.390 And this just gives a little view

488 00:23:08.390 --> 00:23:10.270 spin through these real fast.

489 00:23:10.270 --> 00:23:12.500 It shows in this case,

490 00:23:12.500 --> 00:23:17.500 this is kind of collocates ozone exceedance days.

491 00:23:17.940 --> 00:23:20.120 Days the year that this was mapped,

492 00:23:20.120 --> 00:23:23.380 it was 2007 when this first came out,

493 00:23:23.380 --> 00:23:28.380 but where there's ozone exceedance days and where ragweed,

494 00:23:28.490 --> 00:23:32.080 which is a plant that produces an arrow allogenic pollen

495 00:23:32.080 --> 00:23:35.810 and tends to produce it in late summer, early fall.

496 00:23:35.810 --> 00:23:38.120 Exactly the same time in much the US

497 00:23:38.120 --> 00:23:40.850 when ozone exceedance days in the hot

498 00:23:40.850 --> 00:23:43.590 and often still days of late summer

499 00:23:43.590 --> 00:23:46.050 can exacerbate ozone concentrations

500 00:23:46.050 --> 00:23:50.460 and the two conditions present a double whammy to health.

501 00:23:50.460 --> 00:23:55.080 The more sepia-toned areas in the map

502 00:23:55.080 --> 00:23:59.970 show where ozone exceedance days and ragweed

503 00:23:59.970 --> 00:24:04.970 are co-located and found kind of a map of relative risks.

504 00:24:05.100 --> 00:24:07.750 This map kind of survived through the years,

505 00:24:07.750 --> 00:24:11.550 had a real evergreen kind of lifespan

506 00:24:11.550 --> 00:24:14.940 because every year in the spring it's tree pollen.

507 00:24:14.940 --> 00:24:16.740 In the summer, it's grass pollen.

508 00:24:16.740 --> 00:24:18.370 In the fall, its ragweed,

509 00:24:18.370 --> 00:24:21.850 and there's a lot of pollen sufferers in the country.

510 00:24:21.850 --> 00:24:24.820 So we find that this gives us an opportunity

511 00:24:24.820 --> 00:24:28.030 to bring up those interconnections year after year.

512 00:24:28.030 --> 00:24:29.840 Next slide please.

513 00:24:29.840 --> 00:24:32.970 And this is just one other example of those

514 00:24:32.970 --> 00:24:36.170 national maps that take data sets and put them together

515 00:24:36.170 --> 00:24:37.200 in a novel way.

516 00:24:37.200 --> 00:24:38.800 This is the dengue fever.

517 00:24:38.800 --> 00:24:42.810 It maps where the two mosquito species,

518 00:24:42.810 --> 00:24:45.420 Aedes aegypti and Aedes albopictus

519 00:24:45.420 --> 00:24:48.270 were at the time found in the US

520 00:24:48.270 --> 00:24:51.940 using ArboNET dataset to map the vector.

521 00:24:51.940 --> 00:24:53.690 And it combined that with

522 00:24:53.690 --> 00:24:56.300 centers for disease control and prevention

523 00:24:56.300 --> 00:24:59.080 reports of dengue fever cases.

524 00:24:59.080 --> 00:25:02.880 Most of those admittedly were imported cases

525 00:25:02.880 --> 00:25:05.600 from people traveling outside the US

526 00:25:05.600 --> 00:25:08.760 becoming infected back to home

527 00:25:08.760 --> 00:25:11.480 and developing infection and symptoms.

528 00:25:11.480 --> 00:25:12.820 But that said,

529 00:25:12.820 --> 00:25:16.240 it is feasible that a mosquito vector

530 00:25:16.240 --> 00:25:20.730 could come into contact by a infected person,

531 00:25:20.730 --> 00:25:23.210 and it could become a local transmission source.

532 00:25:23.210 --> 00:25:27.880 And there, there is local transmission of dengue fever

533 00:25:27.880 --> 00:25:32.130 in some areas of Texas, of Florida of Hawaii.

534 00:25:32.130 --> 00:25:35.230 So this again was just a mapping example

535 00:25:35.230 --> 00:25:37.680 that began a series of discussions

536 00:25:37.680 --> 00:25:39.370 that has had a long lifetime.

537 00:25:39.370 --> 00:25:41.720 Interestingly, the year after this came out,

538 00:25:41.720 --> 00:25:44.640 this came out in 2009 and in 2010,

539 00:25:44.640 --> 00:25:47.660 CDC made dengue fever a reproval illness.

540 00:25:47.660 --> 00:25:49.700 We have to take credit for that,

541 00:25:49.700 --> 00:25:53.690 but it's kind of indicative that the national dialogue

542 00:25:53.690 --> 00:25:55.380 was amped up for a lot of reasons

543 00:25:55.380 --> 00:25:56.810 around that infectious disease.

544 00:25:56.810 --> 00:25:57.883 Next slide please.

545 00:25:59.390 --> 00:26:01.050 So just some more URLs,

546 00:26:01.050 --> 00:26:02.410 'cause I want you to have resources

547 00:26:02.410 --> 00:26:05.930 when I'm here and when we're done.

548 00:26:05.930 --> 00:26:09.700 We at NRDC put together weather detailed

549 00:26:09.700 --> 00:26:11.420 climate health fact sheets,

550 00:26:11.420 --> 00:26:13.070 or I think seven states.

551 00:26:13.070 --> 00:26:14.580 Michigan is shown here.

552 00:26:14.580 --> 00:26:17.260 We also have California, Colorado,

553 00:26:17.260 --> 00:26:21.530 Illinois, Virginia, Washington, and Pennsylvania.

554 00:26:21.530 --> 00:26:23.700 A lot of detail, a lot of citations

555 00:26:23.700 --> 00:26:25.210 for people that may be doing

556 00:26:25.210 --> 00:26:27.800 climate health work in those areas.

557 00:26:27.800 --> 00:26:32.800 And the last link is our current URL

558 00:26:33.120 --> 00:26:34.950 that tries to put together in one place,

559 00:26:34.950 --> 00:26:36.020 the climate and health work.

560 00:26:36.020 --> 00:26:37.640 And we'll be updating this soon.

561 00:26:37.640 --> 00:26:39.250 Next slide please.

562 00:26:39.250 --> 00:26:40.810 Okay.

563 00:26:40.810 --> 00:26:42.380 Checking my time.

564 00:26:42.380 --> 00:26:46.923 I'm in the bend to two other huge opportunities.

565 00:26:47.760 --> 00:26:49.653 Huge learning experiences for me,

566 00:26:50.780 --> 00:26:52.780 and I'll talk about them a little bit.

567 00:26:52.780 --> 00:26:55.690 But first NCA3 National Climate Assessment.

568 00:26:55.690 --> 00:26:58.780 The third US National Climate Assessment.

569 00:26:58.780 --> 00:27:01.660 I was fortunate enough to work on this effort

570 00:27:01.660 --> 00:27:04.880 as one of the co-convening lead authors

571 00:27:04.880 --> 00:27:06.510 for the Human Health chapter.

572 00:27:06.510 --> 00:27:11.140 This was back in kind of 2011 through 2014.

573 00:27:11.140 --> 00:27:13.700 There has since been a fourth iteration

574 00:27:13.700 --> 00:27:15.750 of The national Climate Assessment

575 00:27:15.750 --> 00:27:20.090 and right now work on the fifth assessment is underway.

576 00:27:20.090 --> 00:27:23.150 But this was a huge learning opportunity for me,

577 00:27:23.150 --> 00:27:26.000 I'd like to network with amazing scientists

578 00:27:26.000 --> 00:27:29.160 and see how the NCA reports come out.

579 00:27:29.160 --> 00:27:31.820 But it was very gratifying and interesting

580 00:27:31.820 --> 00:27:34.440 that this was the vintage of NCA

581 00:27:34.440 --> 00:27:37.090 when the here and now message

582 00:27:37.090 --> 00:27:38.550 really came to the fore.

583 00:27:38.550 --> 00:27:40.300 The climate impacts on health

584 00:27:40.300 --> 00:27:43.080 are happening here and now in the US.

585 00:27:43.080 --> 00:27:43.913 Probably the first time

586 00:27:43.913 --> 00:27:45.610 that's been so loud and clear.

587 00:27:45.610 --> 00:27:47.210 Translation.

588 00:27:47.210 --> 00:27:50.000 The whole effort was aimed to make

589 00:27:50.000 --> 00:27:51.900 all the information in all the chapters

590 00:27:51.900 --> 00:27:54.920 entirely digestible, not just to, you know,

591 00:27:54.920 --> 00:27:57.610 academics or scientists working in the field,

592 00:27:57.610 --> 00:28:00.660 but to everyone to the, you know, the public.

593 00:28:00.660 --> 00:28:02.100 And I really respect that

594 00:28:02.100 --> 00:28:04.030 and learned a lot from that effort.

595 00:28:04.030 --> 00:28:05.430 And third vulnerability.

596 00:28:05.430 --> 00:28:08.940 It was one of the first times that the differential,

597 00:28:08.940 --> 00:28:11.960 the disparate, the inequitable vulnerability

598 00:28:11.960 --> 00:28:14.830 of some places and people and communities,

599 00:28:14.830 --> 00:28:17.070 the climate change really was emphasized.

600 00:28:17.070 --> 00:28:18.840 Next slide, please.

601 00:28:18.840 --> 00:28:22.570 This is just some reflection on that here and now

602 00:28:22.570 --> 00:28:26.690 in the years, since that effort.

603 00:28:26.690 --> 00:28:28.060 Sadly year after year,

604 00:28:28.060 --> 00:28:29.420 it seems like we, you know,

605 00:28:29.420 --> 00:28:32.263 just get more of the lived experience of climate change.

606 00:28:33.120 --> 00:28:36.020 Years 2013 to the present, all of them

607 00:28:36.020 --> 00:28:41.020 in the top 10 warmest years globally ever recorded.

608 00:28:41.070 --> 00:28:42.960 The two gentlemen in the upper left

609 00:28:42.960 --> 00:28:45.970 are members of the National Medical Association.

610 00:28:45.970 --> 00:28:48.081 They surveyed their members down

611 00:28:48.081 --> 00:28:50.320 86% of their survey members said

612 00:28:50.320 --> 00:28:54.820 climate change is directly relevant to patient care.

613 00:28:54.820 --> 00:28:57.387 I mean, the physicians, the both the public health

614 00:28:57.387 --> 00:29:00.360 and medical communities and more and more people

615 00:29:00.360 --> 00:29:02.620 are learning about climate change from life,

616 00:29:02.620 --> 00:29:05.010 from experience and less so from reports

617 00:29:05.010 --> 00:29:06.750 and academic efforts.

618 00:29:06.750 --> 00:29:07.853 Next slide, please.

619 00:29:08.970 --> 00:29:11.750 Something else that NCA3 and other reports

620 00:29:11.750 --> 00:29:13.740 certainly have done is this.

621 00:29:13.740 --> 00:29:17.870 The view on the left is under a relatively lower

622 00:29:17.870 --> 00:29:21.110 greenhouse gas emissions scenario.

623 00:29:21.110 --> 00:29:24.260 The one on the right under a relatively higher

624 00:29:24.260 --> 00:29:27.920 emission scenario and kind of painting the difference

625 00:29:27.920 --> 00:29:29.810 in this case here.

626 00:29:29.810 --> 00:29:32.830 If you could just go back advance, that happens.

627 00:29:32.830 --> 00:29:34.180 Thank you, thank you.

628 00:29:34.180 --> 00:29:36.920 Giving a sense of the difference between

629 00:29:36.920 --> 00:29:39.250 the low emission scenario

630 00:29:39.250 --> 00:29:41.700 like three degrees Fahrenheit

631 00:29:41.700 --> 00:29:46.240 difference between now and the hottest days of the 2090s

632 00:29:46.240 --> 00:29:48.510 versus on the right higher emissions

633 00:29:48.510 --> 00:29:51.090 more like a 10 degrees Fahrenheit difference

634 00:29:51.090 --> 00:29:54.220 on the highest temperature on the hottest days.

635 00:29:54.220 --> 00:29:55.990 Giving a sense of what we can accomplish

636 00:29:55.990 --> 00:29:58.310 and what we can avoid by moving

637 00:29:59.270 --> 00:30:01.900 with all haste toward cleaner energy.

638 00:30:01.900 --> 00:30:03.910 Now, next slide please.

639 00:30:03.910 --> 00:30:08.730 And I bet you in this course and in your work,

640 00:30:08.730 --> 00:30:12.570 you talk a lot and we're all cognizant of, you know,

641 00:30:12.570 --> 00:30:17.570 the elderly, the very young, economically disadvantaged,

642 00:30:17.910 --> 00:30:19.890 many communities of color,

643 00:30:19.890 --> 00:30:22.180 people with preexisting conditions,

644 00:30:22.180 --> 00:30:26.000 certain locations, not equally vulnerable

645 00:30:26.000 --> 00:30:27.290 to climate health effects.

646 00:30:27.290 --> 00:30:31.950 The IPCC report that Kai mentioned that came out today,

647 00:30:31.950 --> 00:30:35.850 estimates that basically half of the world's population

648 00:30:35.850 --> 00:30:40.120 like 3.6 billion live in what they're calling hot spots.

649 00:30:40.120 --> 00:30:43.851 You have to wonder if half of the world's lives in a hotspot

650 00:30:43.851 --> 00:30:46.590 kind of changes the meaning of hotspot.

651 00:30:46.590 --> 00:30:48.070 In other words,

652 00:30:48.070 --> 00:30:52.063 billions of us are highly vulnerable and highly exposed.

653 00:30:53.410 --> 00:30:54.580 Next slide, please.

654 00:30:54.580 --> 00:30:59.580 I wanna mention kind of in this transition of data is great.

655 00:30:59.720 --> 00:31:02.023 It's very rich, but what can we do with it?

656 00:31:03.340 --> 00:31:05.190 Partnerships.

657 00:31:05.190 --> 00:31:09.400 Taking your findings, your work, your projects,

658 00:31:09.400 --> 00:31:11.830 your papers, your knowledge,

659 00:31:11.830 --> 00:31:14.930 and using it to learn about the lived experience

660 00:31:14.930 --> 00:31:17.580 about local knowledge, local expertise

661 00:31:17.580 --> 00:31:21.750 in partnership with people, communities and groups

662 00:31:21.750 --> 00:31:23.670 who live in some of those highly exposed

663 00:31:23.670 --> 00:31:27.300 and vulnerable areas it's what makes the work real.

664 00:31:27.300 --> 00:31:31.010 It can really turn the data that we have into action.

665 00:31:31.010 --> 00:31:33.440 And I wanna share with you a story,

666 00:31:33.440 --> 00:31:36.090 you know, my again, great fortune...

667 00:31:36.090 --> 00:31:36.923 Next slide, please,

668 00:31:36.923 --> 00:31:41.770 in working with NRDC and partners in Ahmedabad India,

669 00:31:41.770 --> 00:31:44.960 a city in Western India in Gujarat state.

670 00:31:44.960 --> 00:31:47.500 I actually see one of my dear colleagues

671 00:31:47.500 --> 00:31:50.450 and partners from that work is here today.

672 00:31:50.450 --> 00:31:52.550 I'm very glad Dr. Pavian.

673 00:31:53.760 --> 00:31:56.710 In 2010, this city experienced

674 00:31:56.710 --> 00:31:59.890 what was for Ahmedabad's historic heat wave.

675 00:31:59.890 --> 00:32:01.930 This is a news report that there were

676 00:32:01.930 --> 00:32:04.540 over 50 people who had died but...

677 00:32:04.540 --> 00:32:05.690 Next slide please.

678 00:32:05.690 --> 00:32:09.760 It turns out that upon further investigation

679 00:32:09.760 --> 00:32:13.170 among this partner team with the local experts

680 00:32:13.170 --> 00:32:17.373 and health scientists and researchers and NRDC researchers,

681 00:32:18.210 --> 00:32:22.470 it was more like over 1300 excess deaths

682 00:32:22.470 --> 00:32:24.870 in the month that the heat wave occurred.

683 00:32:24.870 --> 00:32:27.300 This graphic became known as the graph

684 00:32:27.300 --> 00:32:30.440 because it told a story graphically

685 00:32:30.440 --> 00:32:34.240 that had great meaning and motivated

686 00:32:36.210 --> 00:32:38.940 the Ahmedabad municipal corporation leadership,

687 00:32:38.940 --> 00:32:42.890 fantastic leadership from the city, just who said no more.

688 00:32:42.890 --> 00:32:45.743 This peak that one can see in the red,

689 00:32:47.290 --> 00:32:52.150 upper line of a peak with maximum temperature,

690 00:32:52.150 --> 00:32:53.690 that's maximum temperature peak,

691 00:32:53.690 --> 00:32:55.673 right below a daily death counts.

692 00:32:56.540 --> 00:32:58.330 Then Mayor said no more.

693 00:32:58.330 --> 00:33:00.610 I do not want this to happen again to,

694 00:33:00.610 --> 00:33:01.990 you know, the people of Ahmedabad.

695 00:33:01.990 --> 00:33:04.570 So next slide, please.

696 00:33:04.570 --> 00:33:08.200 The city, the leadership at our great partners,

697 00:33:08.200 --> 00:33:10.653 Indian Institute of Public Health in Gandhinagar,

698 00:33:11.760 --> 00:33:14.930 NRDC other experts help the city put together

699 00:33:14.930 --> 00:33:16.250 a heat action plan.

700 00:33:16.250 --> 00:33:18.950 Then first, all of South Asia

701 00:33:18.950 --> 00:33:21.320 with an early warning system with outreach

702 00:33:21.320 --> 00:33:24.300 to the most heat vulnerable communities

703 00:33:24.300 --> 00:33:28.160 with extra like dialogue with health professionals,

704 00:33:28.160 --> 00:33:30.040 with outreach to the media,

705 00:33:30.040 --> 00:33:33.130 and it really changed the whole kind of equation,

706 00:33:33.130 --> 00:33:35.600 dynamic appreciation of heat.

707 00:33:35.600 --> 00:33:39.240 Extreme heat as an approachable public health issue

708 00:33:39.240 --> 00:33:41.350 that and we can do something about it.

709 00:33:41.350 --> 00:33:42.503 Next slide, please.

710 00:33:44.300 --> 00:33:46.990 The people of Ahmedabad as well as city leadership

711 00:33:46.990 --> 00:33:49.430 took this issue and made it their own.

712 00:33:49.430 --> 00:33:53.450 This shows women and people having a parade

713 00:33:53.450 --> 00:33:56.710 to the streets of the city to raise awareness.

714 00:33:56.710 --> 00:34:01.710 On the right you see city leaders putting rooftops white

715 00:34:02.680 --> 00:34:05.470 to be more reflective and reduce indoor temperatures.

716 00:34:05.470 --> 00:34:06.500 Next slide please.

717 00:34:06.500 --> 00:34:10.180 And actually we were able to conduct an evaluation

718 00:34:10.180 --> 00:34:13.100 of the work in Ahmedabad and found that there were

719 00:34:13.100 --> 00:34:14.910 in the years after the launch

720 00:34:14.910 --> 00:34:17.920 of the heat action plan in 2013.

721 00:34:17.920 --> 00:34:22.920 And the years after the city avoided 1100 premature deaths.

722 00:34:24.440 --> 00:34:25.820 Not strictly heat related,

723 00:34:25.820 --> 00:34:29.280 but the deaths in there in the summer heat season

724 00:34:29.280 --> 00:34:31.313 were reduced dramatically.

725 00:34:32.490 --> 00:34:34.560 Could be a host of different reasons,

726 00:34:34.560 --> 00:34:38.380 but surely the heat action plan factored into that

727 00:34:38.380 --> 00:34:42.430 and that was published in journal environmental

728 00:34:42.430 --> 00:34:44.980 and public health. Dr. Jeremy Hess

729 00:34:44.980 --> 00:34:47.870 was the lead author on that.

730 00:34:47.870 --> 00:34:49.170 Next slide please.

731 00:34:49.170 --> 00:34:50.710 I'm rounding the bend.

732 00:34:50.710 --> 00:34:55.710 And I want to say thank you to Ahmedabad as always

733 00:34:55.930 --> 00:34:57.750 our partners there

734 00:34:57.750 --> 00:35:00.010 for that amazing work which continues

735 00:35:00.010 --> 00:35:02.450 both in terms of extreme heat

736 00:35:02.450 --> 00:35:04.630 and now we're working on air pollution as well.

737 00:35:04.630 --> 00:35:07.810 But to bring our climate and health work

738 00:35:07.810 --> 00:35:09.480 and data back home,

739 00:35:09.480 --> 00:35:11.890 this is an appreciation of the health related costs

740 00:35:11.890 --> 00:35:13.200 of climate change.

741 00:35:13.200 --> 00:35:14.240 You could definitely say

742 00:35:14.240 --> 00:35:16.430 we're already paying for climate change with our health.

743 00:35:16.430 --> 00:35:18.070 Next slide, please.

744 00:35:18.070 --> 00:35:22.103 In 2011, NRDC lucky to work on this work,

745 00:35:23.050 --> 00:35:28.050 took the first look from already published reports papers

746 00:35:28.240 --> 00:35:31.730 on kinds of events that are

747 00:35:31.730 --> 00:35:33.430 going to increase in the future

748 00:35:33.430 --> 00:35:36.170 in intensity and duration and frequency

749 00:35:36.170 --> 00:35:38.660 with climate change, climate sensitive events

750 00:35:38.660 --> 00:35:41.290 and health outcomes related to them.

751 00:35:41.290 --> 00:35:45.790 Heat wave, wildfire seasons, hurricane seasons.

752 00:35:45.790 --> 00:35:49.010 You can see kind of the array across the US.

753 00:35:49.010 --> 00:35:51.710 And in that first study, we found,

754 00:35:51.710 --> 00:35:54.280 we were surprised to find $14 billion

755 00:35:54.280 --> 00:35:57.400 in health-related costs, just from six

756 00:35:57.400 --> 00:35:59.010 those events that were documented.

757 00:35:59.010 --> 00:36:01.400 Surely those are not the only six

758 00:36:01.400 --> 00:36:03.870 such events that occurred in that time,

759 00:36:03.870 --> 00:36:06.660 but we lack integrated databases

760 00:36:06.660 --> 00:36:10.760 that give an ability to discern the whole fabric

761 00:36:10.760 --> 00:36:12.350 of climate sensitive events.

762 00:36:12.350 --> 00:36:13.900 Next slide please.

763 00:36:13.900 --> 00:36:17.690 But this interest in valuation continued strongly

764 00:36:17.690 --> 00:36:22.010 with this report and the Fourth National Climate Assessment.

765 00:36:22.010 --> 00:36:23.470 Next slide please.

766 00:36:23.470 --> 00:36:27.500 And my NRDC colleague, Dr. Vijay Limaye

767 00:36:27.500 --> 00:36:30.940 just advance it a couple times, if you don't mind please.

768 00:36:30.940 --> 00:36:34.580 And we will see that Dr. Limaye looked at

769 00:36:34.580 --> 00:36:36.880 just one year, 2012.

770 00:36:36.880 --> 00:36:39.900 Again, looked through the literature to document events.

771 00:36:39.900 --> 00:36:43.200 This was 10 different events and came up with

772 00:36:44.057 --> 00:36:49.057 $10 billion in health related costs typically unassigned.

773 00:36:49.080 --> 00:36:51.060 Health costs are not included when you hear

774 00:36:51.060 --> 00:36:54.780 about Noah's billion dollar disaster tally.

775 00:36:54.780 --> 00:36:55.613 Next slide.

776 00:36:56.760 --> 00:36:58.430 This is really important information

777 00:36:58.430 --> 00:37:00.280 for us to keep in mind

778 00:37:00.280 --> 00:37:04.610 that there will be over 37,000 encounters

779 00:37:04.610 --> 00:37:07.120 related to those climate sensitive events

780 00:37:07.120 --> 00:37:09.130 with these kind of costs.

781 00:37:09.130 --> 00:37:12.060 And 2/3 of the illness costs being paid

782 00:37:12.060 --> 00:37:14.150 for Medicare and Medicaid encounters.

783 00:37:14.150 --> 00:37:17.430 These kind of realities need to be factored in

784 00:37:17.430 --> 00:37:19.910 when at least for me when I hear people say

785 00:37:19.910 --> 00:37:22.670 it's gonna be so expensive to make that leap

786 00:37:22.670 --> 00:37:24.610 to greener and cleaner energy.

787 00:37:24.610 --> 00:37:27.053 We have to put health into the picture.

788 00:37:28.110 --> 00:37:29.360 Next slide, please.

789 00:37:29.360 --> 00:37:32.470 I know I'm a little over, but we're almost done.

790 00:37:32.470 --> 00:37:35.750 I don't know if you've had Dr. Ed Maibach

791 00:37:35.750 --> 00:37:39.310 from George Mason University come and speak with you,

792 00:37:39.310 --> 00:37:41.560 but he is a real leader and has been

793 00:37:42.840 --> 00:37:45.710 for a while in this climate and health messaging.

794 00:37:45.710 --> 00:37:47.730 Along with that your colleagues

795 00:37:47.730 --> 00:37:49.400 at Yale University, for sure.

796 00:37:49.400 --> 00:37:52.480 But Ed Maibach has a way of putting it like this.

797 00:37:52.480 --> 00:37:54.840 It's, you know, five messages,

798 00:37:54.840 --> 00:37:59.042 experts agree, climate change it's real, it's us

799 00:37:59.042 --> 00:38:02.060 it's anthropogenic, it bad yes.

800 00:38:02.060 --> 00:38:05.170 The more we learn, the more sobered we are

801 00:38:05.170 --> 00:38:09.930 by the impacts and their effects on people's health.

802 00:38:09.930 --> 00:38:12.163 But these are solvable issues.

803 00:38:13.470 --> 00:38:14.700 Next slide please.

804 00:38:14.700 --> 00:38:18.370 But they're solvable when we take our knowledge

805 00:38:19.300 --> 00:38:22.650 and our outrage perhaps the knowledge we learn,

806 00:38:22.650 --> 00:38:27.230 and we determine that we're gonna protect the people,

807 00:38:27.230 --> 00:38:31.450 the places that we care about and the people and places

808 00:38:31.450 --> 00:38:34.530 that we can't even see perhaps

809 00:38:34.530 --> 00:38:37.720 because it is, we are a global community.

810 00:38:37.720 --> 00:38:39.680 There is no doubt.

811 00:38:39.680 --> 00:38:42.830 And when we protect the most vulnerable,

812 00:38:42.830 --> 00:38:44.780 those who are on the front lines of, you know,

813 00:38:44.780 --> 00:38:48.910 suffering the worst impacts, when we go first to them,

814 00:38:48.910 --> 00:38:50.600 we learn a great deal.

815 00:38:50.600 --> 00:38:53.600 We help them, you know, most imminently

816 00:38:53.600 --> 00:38:56.280 we help ourselves to build that healthier

817 00:38:56.280 --> 00:38:58.530 and more secure future.

818 00:38:58.530 --> 00:39:00.330 That data is really about

819 00:39:00.330 --> 00:39:04.330 because if data doesn't help us connect with each other

820 00:39:04.330 --> 00:39:07.290 and connect to the, like the last doc,

821 00:39:07.290 --> 00:39:09.630 which is, I don't want my children,

822 00:39:09.630 --> 00:39:12.730 my grandchildren to live in a science fiction.

823 00:39:12.730 --> 00:39:15.330 I wanna give them like a future, you know,

824 00:39:15.330 --> 00:39:18.780 in my small part that's worth living

825 00:39:18.780 --> 00:39:22.633 and a current day that is, you know, worth fighting for.

826 00:39:23.750 --> 00:39:24.630 And we're gonna do that.

827 00:39:24.630 --> 00:39:26.180 So with that...

828 00:39:26.180 --> 00:39:28.320 Next slide or two.

829 00:39:28.320 --> 00:39:29.153 Thank you.

830 00:39:30.870 --> 00:39:33.780 We'll keep our eyes open our hearts open

831 00:39:33.780 --> 00:39:36.200 and our data streams open to learn about

832 00:39:36.200 --> 00:39:38.350 the differential impacts of climate change

833 00:39:38.350 --> 00:39:40.300 on our health around the globe

834 00:39:40.300 --> 00:39:44.370 with all humility and respect and that's me.

835 00:39:44.370 --> 00:39:46.290 And that's where you can find me

836 00:39:46.290 --> 00:39:48.320 at that at the NRDC email.

837 00:39:48.320 --> 00:39:50.850 I'm at Columbia, but I pick up emails

838 00:39:50.850 --> 00:39:52.103 mostly from NRDC.

839 00:39:53.530 --> 00:39:54.640 And we blog.

840 00:39:54.640 --> 00:39:57.330 And now lucky me, I get a chance hopefully,

841 00:39:57.330 --> 00:40:02.320 to listen to you and your experiences, concerns, questions.

842 00:40:02.320 --> 00:40:05.850 So the last slide is just, you know, the question

843 00:40:05.850 --> 00:40:09.250 but if you wanna leave the contact info up there Kai,

844 00:40:09.250 --> 00:40:10.083 that would be fine.

845 00:40:10.083 --> 00:40:11.060 Thank you everyone.

846 00:40:11.060 --> 00:40:12.370 Thanks for giving me a chance

847 00:40:12.370 --> 00:40:15.860 to talk with you and tell you my story.

848 00:40:15.860 --> 00:40:17.360 <v ->Thank you Kim.</v>

849 00:40:17.360 --> 00:40:19.880 Thanks for the wonderful story from your research

850 00:40:21.231 --> 00:40:24.380 to the community engagement and to the policy.

851 00:40:24.380 --> 00:40:27.374 So I think we can first give a round of applaud for...

852 00:40:27.374 --> 00:40:29.791 (indistinct)

853 00:40:31.115 --> 00:40:33.160 Well all those joining online

854 00:40:33.160 --> 00:40:34.410 if you do have questions,

855 00:40:34.410 --> 00:40:38.260 please feel free to post your question in the chat box.

856 00:40:38.260 --> 00:40:40.700 But Yiqun has already gathered

857 00:40:40.700 --> 00:40:43.560 a lot of question from our students.

858 00:40:43.560 --> 00:40:46.660 Our students read some of the readings materials you sent,

859 00:40:46.660 --> 00:40:50.980 and I think I summarize some into big categories.

860 00:40:50.980 --> 00:40:55.670 So the very first question many students are having is that

861 00:40:55.670 --> 00:40:59.280 you showed your 2011 paper on the cost

862 00:40:59.280 --> 00:41:02.160 of the health impact climate change,

863 00:41:02.160 --> 00:41:03.209 and also Dr.

864 00:41:03.209 --> 00:41:08.209 One at the 2019 GeoHealth paper.

865 00:41:08.770 --> 00:41:09.743 <v ->Yeah.</v>

866 00:41:09.743 --> 00:41:11.480 <v ->And the students are wondering, like,</v>

867 00:41:11.480 --> 00:41:14.810 we know this message is important,

868 00:41:14.810 --> 00:41:19.513 but have you been surprised at all

869 00:41:19.513 --> 00:41:22.940 with how your data has been used

870 00:41:22.940 --> 00:41:24.570 or by who has been citing it?

871 00:41:24.570 --> 00:41:29.120 And do you see any impact from using your paper

872 00:41:29.120 --> 00:41:32.233 in politics or in implementation?

873 00:41:35.990 --> 00:41:38.090 <v ->I will give a few examples.</v>

874 00:41:38.090 --> 00:41:40.573 And I think that the headline is yes.

875 00:41:43.040 --> 00:41:44.413 Yes it's starting.

876 00:41:46.290 --> 00:41:47.330 I could tell.

877 00:41:47.330 --> 00:41:48.470 First, I'll answer the question

878 00:41:48.470 --> 00:41:50.370 then maybe I'll go back to the genesis

879 00:41:51.281 --> 00:41:53.180 of the health cost work.

880 00:41:53.180 --> 00:41:55.670 Yes, from almost the start when (indistinct)

881 00:41:55.670 --> 00:41:59.770 Dr. Limaye in particular, because

882 00:41:59.770 --> 00:42:03.430 frankly the 2019, the GeoHealth paper that you have

883 00:42:03.430 --> 00:42:05.770 both the paper and the back sheet from

884 00:42:06.860 --> 00:42:10.360 Dr. Vijay did a really interesting analysis

885 00:42:10.360 --> 00:42:13.500 that got to a lot more of the particulars.

886 00:42:13.500 --> 00:42:16.340 And we found that in among the 10 sites

887 00:42:16.340 --> 00:42:18.513 that were the case studies,

888 00:42:19.900 --> 00:42:23.220 there was interest from some like governor's offices

889 00:42:23.220 --> 00:42:24.750 and some of the states.

890 00:42:24.750 --> 00:42:28.520 We heard the paper referenced in congressional hearings

891 00:42:29.460 --> 00:42:31.433 on climate and health topics.

892 00:42:32.540 --> 00:42:35.850 The earlier 2011, that first work,

893 00:42:35.850 --> 00:42:40.340 the NRDC worked on with health economists

894 00:42:40.340 --> 00:42:42.410 at University of California.

895 00:42:42.410 --> 00:42:47.070 That was cited recently in an amicus brief.

896 00:42:47.070 --> 00:42:50.406 That is, you know, when friends of the court get together

897 00:42:50.406 --> 00:42:53.420 and put together evidence that supports their side.

898 00:42:53.420 --> 00:42:56.400 That was cited in support of, you know,

899 00:42:56.400 --> 00:43:01.030 kind of the previous court findings

900 00:43:02.100 --> 00:43:05.870 kind of asserting and I'm sorry, EPAs

901 00:43:05.870 --> 00:43:08.300 ability to regulate greenhouse gases.

902 00:43:08.300 --> 00:43:10.000 It was cited there.

903 00:43:10.000 --> 00:43:13.190 It got both of the valuation studies

904 00:43:13.190 --> 00:43:17.160 got quite a lot of press at the time.

905 00:43:17.160 --> 00:43:22.160 So between media and those mentions in state

906 00:43:23.030 --> 00:43:24.800 and federal level hearings,

907 00:43:24.800 --> 00:43:26.710 I wouldn't say that, you know,

908 00:43:26.710 --> 00:43:29.950 legislation has not been based on them.

909 00:43:29.950 --> 00:43:34.430 It's not always like a law or a regulation per se,

910 00:43:34.430 --> 00:43:38.030 but just to see the work used

911 00:43:38.030 --> 00:43:43.030 in a policy building framework is very satisfying.

912 00:43:45.320 --> 00:43:47.910 And you know, I think that for any of us,

913 00:43:47.910 --> 00:43:52.410 when we see our science kind of move out of the ivory tower

914 00:43:52.410 --> 00:43:55.400 or off the bookshelf and into, you know,

915 00:43:55.400 --> 00:43:58.650 movement toward action, that's great.

916 00:43:58.650 --> 00:44:02.460 That's why only speaking personally, that's why I do this.

917 00:44:02.460 --> 00:44:05.120 And I don't even expect that it's gonna happen,

918 00:44:05.120 --> 00:44:07.393 but when it does, it feels good.

919 00:44:08.940 --> 00:44:10.370 <v ->Excellent.</v>

920 00:44:10.370 --> 00:44:13.110 Here comes a relatively more technical question

921 00:44:13.110 --> 00:44:16.530 regarding how you actually calculated the, you know,

922 00:44:16.530 --> 00:44:18.750 economic burden of this cost.

923 00:44:18.750 --> 00:44:21.780 So the students are not very familiar with,

924 00:44:21.780 --> 00:44:24.770 for example, the statistical life lost.

925 00:44:24.770 --> 00:44:27.250 And they're wondering, like, for example,

926 00:44:27.250 --> 00:44:30.440 they understand if you have the Hurricane Sandy,

927 00:44:30.440 --> 00:44:33.020 you can calculate the health damages.

928 00:44:33.020 --> 00:44:34.010 But they're not quite sure

929 00:44:34.010 --> 00:44:36.330 about how you calculate for example,

930 00:44:36.330 --> 00:44:38.420 let's see the ozone pollution.

931 00:44:38.420 --> 00:44:39.970 The ozone air pollution in Nevada.

932 00:44:39.970 --> 00:44:41.820 So how do you, you know,

933 00:44:41.820 --> 00:44:45.340 calculate the cost associated with this mobility

934 00:44:45.340 --> 00:44:46.240 and the mortality?

935 00:44:48.600 --> 00:44:50.870 <v ->I'll try to do a decent job,</v>

936 00:44:50.870 --> 00:44:54.310 just noting that Dr. Limaye could do an awesome job

937 00:44:54.310 --> 00:44:59.110 because he knows the insight and the method,

938 00:44:59.110 --> 00:45:01.137 but to your two,

939 00:45:01.137 --> 00:45:02.840 I mean the two main components

940 00:45:02.840 --> 00:45:05.600 of the valuation assignment are the

941 00:45:05.600 --> 00:45:08.240 mortality and the morbidity.

942 00:45:08.240 --> 00:45:12.020 The mortality, the value of a statistical life

943 00:45:12.020 --> 00:45:15.293 is the basis for that cost assignment.

944 00:45:17.681 --> 00:45:19.140 We've had a lot of discussion,

945 00:45:19.140 --> 00:45:21.540 a lot of questions about what that means.

946 00:45:21.540 --> 00:45:25.440 It's then wide use the environmental protection agency,

947 00:45:25.440 --> 00:45:27.390 for example, has used it for many years.

948 00:45:27.390 --> 00:45:28.840 It kind of evolves.

949 00:45:28.840 --> 00:45:32.230 It is not a statement about the value,

950 00:45:32.230 --> 00:45:34.110 the inherent value of life.

951 00:45:34.110 --> 00:45:39.110 It's comprised of kind of looking at again statistically,

952 00:45:39.540 --> 00:45:42.003 a large group of people and the,

953 00:45:42.003 --> 00:45:45.930 what people would pay to avoid risk of death

954 00:45:45.930 --> 00:45:50.580 across you know, a large and you know, millions of people,

955 00:45:50.580 --> 00:45:51.890 and then assigning that.

956 00:45:51.890 --> 00:45:54.300 So it's way of assigning

957 00:45:57.710 --> 00:46:01.430 willingness to pay to avoid death.

958 00:46:01.430 --> 00:46:05.540 That may not have helped much, but just to be clear,

959 00:46:05.540 --> 00:46:07.730 it's not a statement of life value.

960 00:46:07.730 --> 00:46:09.460 For the morbidity,

961 00:46:09.460 --> 00:46:13.050 for the emergency room visits, hospitalizations,

962 00:46:13.050 --> 00:46:17.860 the outpatient, visits, home healthcare medications.

963 00:46:17.860 --> 00:46:21.680 There are two fantastic databases,

964 00:46:21.680 --> 00:46:25.169 Healthcare Utilization Project HCUP,

965 00:46:25.169 --> 00:46:29.030 and the Medical Expenditure Panel Survey MEPS

966 00:46:29.030 --> 00:46:31.710 that were used to take

967 00:46:32.900 --> 00:46:35.500 the already tabulated health outcomes.

968 00:46:35.500 --> 00:46:39.460 We used already existing reports,

969 00:46:39.460 --> 00:46:42.730 either published literature or state or federal reports.

970 00:46:42.730 --> 00:46:43.563 Excuse me.

971 00:46:44.700 --> 00:46:48.780 And then to assign a value to

972 00:46:50.340 --> 00:46:55.340 the cost related to treatment care

973 00:46:55.960 --> 00:46:57.950 in those different categories.

974 00:46:57.950 --> 00:47:01.210 So we're using kind of national data sets

975 00:47:01.210 --> 00:47:03.590 to assign appropriate costs,

976 00:47:03.590 --> 00:47:05.930 to what was already documented,

977 00:47:05.930 --> 00:47:09.020 and then adding those costs together

978 00:47:09.020 --> 00:47:14.020 and trying to always use and apply a consistent methodology.

979 00:47:14.220 --> 00:47:18.250 If you look in the GeoHealth paper at table four,

980 00:47:18.250 --> 00:47:21.430 it gives you a sense of the different types of costs

981 00:47:22.958 --> 00:47:27.670 that go into the totals for the different locations

982 00:47:27.670 --> 00:47:30.830 and different health outcomes.

983 00:47:30.830 --> 00:47:34.290 So I recommend if that wasn't entirely satisfying,

984 00:47:34.290 --> 00:47:38.190 check out table four in the GeoHealth paper.

985 00:47:38.190 --> 00:47:39.670 But those are great questions.

986 00:47:39.670 --> 00:47:42.180 I mean, we could have a whole,

987 00:47:42.180 --> 00:47:45.790 or maybe do want to have a whole session with Dr. Limaye

988 00:47:45.790 --> 00:47:47.470 to dig in 'cause it's fascinating.

989 00:47:47.470 --> 00:47:52.470 And of course, methodological work is evolving all the time.

990 00:47:54.365 --> 00:47:58.680 It showed us very clearly the great value

991 00:47:58.680 --> 00:48:01.000 of having inter...

992 00:48:01.000 --> 00:48:03.120 Or let's say our goal

993 00:48:03.120 --> 00:48:06.820 to advocate for more integrated climate health

994 00:48:08.330 --> 00:48:12.280 and cost data sets because we had to

995 00:48:12.280 --> 00:48:14.690 spend quite a bit of time and effort

996 00:48:14.690 --> 00:48:18.270 to assemble the different data sets used to

997 00:48:18.270 --> 00:48:20.700 eventually assign those costs.

998 00:48:20.700 --> 00:48:22.340 I hope that helped a bit.

999 00:48:22.340 --> 00:48:23.410 <v ->That helps a lot.</v>

1000 00:48:23.410 --> 00:48:24.670 Thank you, Kim.

1001 00:48:24.670 --> 00:48:28.123 We do have a question from online audience from Leo.

1002 00:48:30.670 --> 00:48:33.780 The question as we saw in the US and world wide

1003 00:48:33.780 --> 00:48:37.210 directly related to the shutdowns and closures we made

1004 00:48:37.210 --> 00:48:39.710 at the start of the pandemic,

1005 00:48:39.710 --> 00:48:41.240 the pollution level was dropped.

1006 00:48:41.240 --> 00:48:44.000 So how do we get back on track

1007 00:48:44.000 --> 00:48:46.463 with those gains that we have now lost?

1008 00:48:48.971 --> 00:48:50.350 <v ->And the reference...</v>

1009 00:48:50.350 --> 00:48:52.860 And this is a question just to be clear,

1010 00:48:52.860 --> 00:48:56.260 the fact that emissions are rising again

1011 00:48:56.260 --> 00:49:00.030 after the diminishment owing to

1012 00:49:00.030 --> 00:49:02.850 relating to the economic shutdown

1013 00:49:02.850 --> 00:49:07.670 and like diminished transportation travel economic activity.

1014 00:49:07.670 --> 00:49:09.193 How do we get back on track?

1015 00:49:12.360 --> 00:49:17.360 Well, we've seen the kind of reductions

1016 00:49:17.360 --> 00:49:20.910 that are possible not to in any way minimize

1017 00:49:20.910 --> 00:49:23.820 the journey that, and you know, the suffering,

1018 00:49:23.820 --> 00:49:26.640 the loss that people have been through,

1019 00:49:26.640 --> 00:49:29.823 continue to be through with the pandemic,

1020 00:49:31.000 --> 00:49:33.210 not to equate the two in any way,

1021 00:49:33.210 --> 00:49:37.030 but I think we, with everything that's happening right now,

1022 00:49:37.030 --> 00:49:41.380 the realization of that climate impacts

1023 00:49:41.380 --> 00:49:43.000 associated air pollution,

1024 00:49:43.000 --> 00:49:46.720 associated flooding heat related mortality and morbidity

1025 00:49:46.720 --> 00:49:48.483 are just accelerating.

1026 00:49:49.840 --> 00:49:51.950 There simply must be a commitment,

1027 00:49:51.950 --> 00:49:56.950 a demand to move toward cleaner energy systems

1028 00:49:57.280 --> 00:49:59.960 whereby no matter what is happening,

1029 00:49:59.960 --> 00:50:04.890 we can support robust economic activity and not be polluting

1030 00:50:04.890 --> 00:50:08.620 and creating the health harms today

1031 00:50:08.620 --> 00:50:10.670 and the climate related harms in future.

1032 00:50:10.670 --> 00:50:13.860 I think if anything, you know,

1033 00:50:13.860 --> 00:50:18.710 it sobers us as to how vulnerable

1034 00:50:18.710 --> 00:50:22.560 we are as a global society to a pandemic.

1035 00:50:22.560 --> 00:50:24.780 How differential the vulnerabilities are.

1036 00:50:24.780 --> 00:50:28.370 How we have to pay attention to the inequities,

1037 00:50:28.370 --> 00:50:31.120 but we simply have to invest and demand

1038 00:50:31.120 --> 00:50:33.150 cleaner energy now.

1039 00:50:33.150 --> 00:50:34.433 there is no time to wait.

1040 00:50:36.610 --> 00:50:37.443 <v ->What a powerful message.</v>

1041 00:50:37.443 --> 00:50:38.670 Thank you Kim.

1042 00:50:38.670 --> 00:50:43.670 As you know, like our students at the MPH students

1043 00:50:44.730 --> 00:50:46.510 and the master students in other schools.

1044 00:50:46.510 --> 00:50:51.350 So they're wonder like for public health students,

1045 00:50:51.350 --> 00:50:52.990 if they're interested in this field,

1046 00:50:52.990 --> 00:50:55.700 I want to, you know, make it do intent

1047 00:50:55.700 --> 00:50:58.150 or at future career plans.

1048 00:50:58.150 --> 00:51:02.240 So what kind of skills do you think that the students

1049 00:51:02.240 --> 00:51:04.100 are currently to liking or maybe

1050 00:51:04.100 --> 00:51:05.540 is best for them to help

1051 00:51:06.424 --> 00:51:08.823 in order to be successful in this field?

1052 00:51:10.430 --> 00:51:13.060 <v ->Well, first good, great.</v>

1053 00:51:13.060 --> 00:51:14.470 Keep your interest alive.

1054 00:51:14.470 --> 00:51:15.303 We need you.

1055 00:51:15.303 --> 00:51:16.370 We need you at the field.

1056 00:51:16.370 --> 00:51:19.090 The world needs you so badly.

1057 00:51:19.090 --> 00:51:20.990 Please continue.

1058 00:51:20.990 --> 00:51:24.150 You know, with every week, with every month, every year,

1059 00:51:24.150 --> 00:51:24.983 the need is greater.

1060 00:51:24.983 --> 00:51:27.023 So good for you, I applaud you.

1061 00:51:29.060 --> 00:51:31.440 MPH students continue your basic,

1062 00:51:31.440 --> 00:51:33.490 you know, skill building.

1063 00:51:33.490 --> 00:51:36.722 I mean, epidemiology, statistics, you know,

1064 00:51:36.722 --> 00:51:41.722 environmental health, social sciences, all of it.

1065 00:51:42.600 --> 00:51:44.120 It's foundational.

1066 00:51:44.120 --> 00:51:47.300 Two communication.

1067 00:51:47.300 --> 00:51:51.530 Building communication skills, writing more.

1068 00:51:51.530 --> 00:51:53.210 Is there an outlet where

1069 00:51:53.210 --> 00:51:55.610 you can, you know, blog or write essays

1070 00:51:55.610 --> 00:51:58.465 or you know, write, write, write,

1071 00:51:58.465 --> 00:52:00.522 and listen, listen, listen.

1072 00:52:00.522 --> 00:52:03.050 Talk with other people.

1073 00:52:03.050 --> 00:52:05.060 Talk with, you know, use every opportunity

1074 00:52:05.060 --> 00:52:10.010 to hone your own speaking and listening skills

1075 00:52:10.010 --> 00:52:13.470 because the amount of information and learning

1076 00:52:13.470 --> 00:52:15.200 and studies that are coming out

1077 00:52:16.550 --> 00:52:18.520 it's like a gusher right now.

1078 00:52:18.520 --> 00:52:22.450 But keep at it and make common cause.

1079 00:52:22.450 --> 00:52:27.450 Find a group, local group, community group, citizens group,

1080 00:52:27.520 --> 00:52:30.500 student group join in with other student,

1081 00:52:30.500 --> 00:52:32.850 do not let your yourself get to the point where

1082 00:52:34.280 --> 00:52:35.970 you have a sense of being alone.

1083 00:52:35.970 --> 00:52:38.180 Like the news is so sober rank,

1084 00:52:38.180 --> 00:52:40.573 the latest science, the data is so sober rank.

1085 00:52:41.910 --> 00:52:43.550 Don't get to the point where you feel like

1086 00:52:43.550 --> 00:52:45.510 you're working alone in a bell jar.

1087 00:52:45.510 --> 00:52:46.630 You are not.

1088 00:52:46.630 --> 00:52:50.130 There are, you know, hundreds of millions likely

1089 00:52:50.130 --> 00:52:51.470 people around the world.

1090 00:52:51.470 --> 00:52:53.950 Maybe more in be interesting to have someone try

1091 00:52:53.950 --> 00:52:55.760 and assign that sometime,

1092 00:52:55.760 --> 00:52:58.550 but you're part of a huge community

1093 00:52:58.550 --> 00:53:01.430 and we all have to have each other's backs,

1094 00:53:01.430 --> 00:53:05.510 but we all have to keep kind of bolstering one another.

1095 00:53:05.510 --> 00:53:10.060 And you know, having a good outlet for our outrage

1096 00:53:10.060 --> 00:53:12.210 and turning it into action,

1097 00:53:12.210 --> 00:53:15.900 making it move so that we're, you know, not burdened.

1098 00:53:15.900 --> 00:53:18.080 Not laid down in our work.

1099 00:53:18.080 --> 00:53:19.230 And keep doing your work.

1100 00:53:19.230 --> 00:53:23.213 Be the best scientist and the most involved person

1101 00:53:23.213 --> 00:53:24.830 that you can be.

1102 00:53:24.830 --> 00:53:27.900 And you'll have skills of plenty

1103 00:53:27.900 --> 00:53:30.854 and people will come and find you.

1104 00:53:30.854 --> 00:53:34.000 But it helps when you go and look yourself

1105 00:53:34.000 --> 00:53:35.223 and make common cause.

1106 00:53:37.336 --> 00:53:38.398 (indistinct)

1107 00:53:38.398 --> 00:53:40.370 <v ->I think we do have a not question,</v>

1108 00:53:40.370 --> 00:53:43.010 but a commenter from the Chan saying that

1109 00:53:43.900 --> 00:53:47.190 the importance of now looking by professional reservations

1110 00:53:47.190 --> 00:53:49.999 is also suggested like the students should be members

1111 00:53:49.999 --> 00:53:50.999 of the APHA.

1112 00:53:53.410 --> 00:53:56.260 <v ->Yes, the American Public Health Association</v>

1113 00:53:56.260 --> 00:54:00.350 has been great on climate change and health

1114 00:54:00.350 --> 00:54:02.050 a few years back, not too many.

1115 00:54:02.050 --> 00:54:04.000 I think it was 2017.

1116 00:54:04.000 --> 00:54:07.640 Climate change was the annual meeting theme.

1117 00:54:07.640 --> 00:54:10.773 And they have student groups.

1118 00:54:11.990 --> 00:54:13.550 This is all, you know,

1119 00:54:13.550 --> 00:54:16.730 it's really important to stay connected locally.

1120 00:54:16.730 --> 00:54:18.440 Find a local community group.

1121 00:54:18.440 --> 00:54:20.300 Ask what can you do?

1122 00:54:20.300 --> 00:54:22.890 How can you learn from them?

1123 00:54:22.890 --> 00:54:23.940 How can you serve them?

1124 00:54:23.940 --> 00:54:25.230 You've got skills.

1125 00:54:25.230 --> 00:54:26.380 I mean, face it.

1126 00:54:26.380 --> 00:54:30.180 Even if you're, you know, in your student hood,

1127 00:54:30.180 --> 00:54:32.723 you're gaining skills, use them.

1128 00:54:34.210 --> 00:54:35.870 Yeah.

1129 00:54:35.870 --> 00:54:37.030 <v ->Thanks Kim.</v>

1130 00:54:37.030 --> 00:54:39.770 A kind of related question to that is

1131 00:54:39.770 --> 00:54:41.360 you have been doing a lot of work

1132 00:54:41.360 --> 00:54:44.260 on the science communications to the general public.

1133 00:54:44.260 --> 00:54:46.470 So the students are wondering, you know,

1134 00:54:46.470 --> 00:54:48.020 we do a lot of academic work,

1135 00:54:48.020 --> 00:54:49.580 we know the science.

1136 00:54:49.580 --> 00:54:52.650 But how can we better communicate

1137 00:54:52.650 --> 00:54:55.220 this connection between climate change of health

1138 00:54:55.220 --> 00:54:57.963 and economy costs to their general public?

1139 00:54:58.846 --> 00:55:03.210 <v ->Oh, well I mean, I could put in a plug for, you know,</v>

1140 00:55:03.210 --> 00:55:06.890 please stay tuned at NRDC via

1141 00:55:06.890 --> 00:55:10.370 the URLs I showed you before.

1142 00:55:10.370 --> 00:55:14.740 www.nrdc.org, but specific to the valuation work,

1143 00:55:14.740 --> 00:55:18.890 it is our intention to keep that going.

1144 00:55:18.890 --> 00:55:21.440 And with you know, new partners and new applications,

1145 00:55:21.440 --> 00:55:24.550 because we're really interested in having a hand

1146 00:55:24.550 --> 00:55:26.340 doing what we can to help

1147 00:55:26.340 --> 00:55:29.220 build that sense of the larger fabric.

1148 00:55:29.220 --> 00:55:31.010 Like the whole fabric

1149 00:55:31.010 --> 00:55:33.822 of what are the climate sensitive events

1150 00:55:33.822 --> 00:55:37.010 and climate sensitive health outcomes

1151 00:55:37.010 --> 00:55:38.820 that climate change is fueling.

1152 00:55:38.820 --> 00:55:41.447 Right now we've got like six one year

1153 00:55:41.447 --> 00:55:42.760 and 10 another year.

1154 00:55:42.760 --> 00:55:45.220 Like little great spots on a map

1155 00:55:45.220 --> 00:55:49.140 that are lit up because there's data and information there.

1156 00:55:49.140 --> 00:55:51.430 But if we're going to have you know,

1157 00:55:51.430 --> 00:55:54.540 an appreciation of who do we serve

1158 00:55:54.540 --> 00:55:56.500 with preparedness and adaptation

1159 00:55:56.500 --> 00:55:58.010 and funding and support first,

1160 00:55:58.010 --> 00:56:01.870 we need a more complete picture so there's that.

1161 00:56:01.870 --> 00:56:05.940 There's also, it occurs to me the at Mailman

1162 00:56:05.940 --> 00:56:07.600 School of Public Health,

1163 00:56:07.600 --> 00:56:11.610 they have put together have organized a global consortium

1164 00:56:11.610 --> 00:56:16.300 made up of over 250 health profession schools.

1165 00:56:16.300 --> 00:56:18.860 Yale school of public health is a member.

1166 00:56:18.860 --> 00:56:21.040 It's called the Global Consortium

1167 00:56:21.040 --> 00:56:23.470 on Climate and Health Education.

1168 00:56:23.470 --> 00:56:28.330 Dr. Cecilia Sorensen at Mailman is the director now.

1169 00:56:28.330 --> 00:56:31.063 And they're doing a fantastic job

1170 00:56:31.063 --> 00:56:36.063 of putting information content trainings, networking

1171 00:56:37.240 --> 00:56:38.950 through their website.

1172 00:56:38.950 --> 00:56:43.340 And because you're a member at Yale School of Public Health,

1173 00:56:43.340 --> 00:56:46.640 I'm sure that there is opportunity to enrich that

1174 00:56:46.640 --> 00:56:50.430 and participate in groups like The Consortium,

1175 00:56:50.430 --> 00:56:53.030 as well as these other membership groups there.

1176 00:56:53.030 --> 00:56:56.080 And all of those groups would be only too happy to

1177 00:56:56.080 --> 00:56:59.600 have you help them learn and then do

1178 00:56:59.600 --> 00:57:01.340 about climate and health communication.

1179 00:57:01.340 --> 00:57:03.550 I guess the last pitch on that is,

1180 00:57:03.550 --> 00:57:05.770 it definitely needs to be a part

1181 00:57:05.770 --> 00:57:07.890 of the climate and health training.

1182 00:57:07.890 --> 00:57:10.160 This communication piece.

1183 00:57:10.160 --> 00:57:12.990 I don't think that we scientists should have to do

1184 00:57:12.990 --> 00:57:15.850 a turn at a place like NRDC,

1185 00:57:15.850 --> 00:57:20.850 where I very fortunate to work with a very, you know,

1186 00:57:20.990 --> 00:57:25.990 enriched and experienced communications group.

1187 00:57:26.620 --> 00:57:29.480 But we all need to have that training

1188 00:57:29.480 --> 00:57:30.720 and learn from one another.

1189 00:57:30.720 --> 00:57:32.450 So put it in the curriculum.

1190 00:57:32.450 --> 00:57:34.450 Maybe that's a conversation you can have

1191 00:57:36.074 --> 00:57:38.330 with your faculty and administration.

1192 00:57:38.330 --> 00:57:39.180 It wouldn't hurt.

1193 00:57:40.390 --> 00:57:41.223 <v ->Thanks Kim.</v>

1194 00:57:41.223 --> 00:57:42.780 And we can have, like...

1195 00:57:44.640 --> 00:57:46.970 I feel like we can have another hour discussion

1196 00:57:46.970 --> 00:57:48.420 on all these topics,

1197 00:57:48.420 --> 00:57:52.360 but unfortunately we have another class right after this.

1198 00:57:52.360 --> 00:57:55.070 So we have to end the discussion today,

1199 00:57:55.070 --> 00:57:57.290 but just to remind everyone that

1200 00:57:57.290 --> 00:58:00.340 the recordings of this lecture will be online.

1201 00:58:00.340 --> 00:58:01.513 So, yeah.

1202 00:58:02.780 --> 00:58:03.613 <v ->I'm sorry, Kai.</v>

1203 00:58:03.613 --> 00:58:04.446 I didn't mean to interrupt,

1204 00:58:04.446 --> 00:58:06.150 but thank you for the opportunity.

1205 00:58:06.150 --> 00:58:07.670 And I did have one last question,

1206 00:58:07.670 --> 00:58:10.090 tell you what it's about a resource.

1207 00:58:10.090 --> 00:58:11.930 I don't know if people know about

1208 00:58:11.930 --> 00:58:15.320 the Climate Change and Human Health Literature Portal,

1209 00:58:15.320 --> 00:58:19.350 which NIEHS put together and it's a compendium

1210 00:58:19.350 --> 00:58:22.330 of lots of climate and health literature.

1211 00:58:22.330 --> 00:58:25.070 I'll be sure to give you the link

1212 00:58:25.070 --> 00:58:27.560 so that you can distribute it among

1213 00:58:27.560 --> 00:58:28.690 the folks who are here today.

1214 00:58:28.690 --> 00:58:31.180 'Cause it's a resource that's online

1215 00:58:31.180 --> 00:58:34.270 and although it's a couple years kind of behind the current,

1216 00:58:34.270 --> 00:58:35.820 it's very it's very good.

1217 00:58:35.820 --> 00:58:37.130 So.

1218 00:58:37.130 --> 00:58:37.963 <v ->Yeah, thank you Kim.</v>

1219 00:58:37.963 --> 00:58:40.120 <v ->Thank you for everything you've given me</v>

1220 00:58:40.120 --> 00:58:41.300 with your questions.

1221 00:58:41.300 --> 00:58:42.810 It's very nourishing to me.

1222 00:58:42.810 --> 00:58:44.650 So I thank you for that everyone

1223 00:58:44.650 --> 00:58:46.630 and good luck with your work.

1224 00:58:46.630 --> 00:58:47.610 <v ->Thank you Kim.</v>