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HIDDEN TRUTH SHOW WITH JIM BRESLO
ONE ON ONE

AVAILABLE ON ALL PODCAST APPS



1
00:00:04,480 --> 00:00:09,580

[Music]

2
00:00:16,250 --> 00:00:12,470

for our listeners the LA Times this week

3
00:00:19,429 --> 00:00:16,260

is doing a five-part LA Times editorial

4
00:00:23,990 --> 00:00:19,439

board editorial on climate change and

5
00:00:27,609 --> 00:00:24,000

the very first one starts with the world

6
00:00:30,740 --> 00:00:27,619

is drifting steadily toward a climate

7
00:00:33,970 --> 00:00:30,750

catastrophe and of course goes on to say

8
00:00:37,520 --> 00:00:33,980

we need radical change yesterday

9
00:00:39,410 --> 00:00:37,530

essentially but yeah it makes a number

10
00:00:42,940 --> 00:00:39,420

of assertions that at this point are

11
00:00:45,170 --> 00:00:42,950

becoming commonly accepted many people

12
00:00:46,610 --> 00:00:45,180

and that's why I thought going through

13
00:00:48,020 --> 00:00:46,620

some of these enlightened letting you

14

00:00:50,540 --> 00:00:48,030

address them so why don't we start with

15

00:00:51,979 --> 00:00:50,550

you addressing that first sentence the

16

00:00:55,729 --> 00:00:51,989

world is drifting steadily toward a

17

00:00:59,720 --> 00:00:55,739

climate catastrophe true no the world is

18

00:01:01,369 --> 00:00:59,730

drifting steadily or unsteadily towards

19

00:01:04,070 --> 00:01:01,379

a modest warming

20

00:01:05,810 --> 00:01:04,080

yeah human beings do have something to

21

00:01:08,929 --> 00:01:05,820

do with the warming that began in the

22

00:01:12,380 --> 00:01:08,939

late 70s but maybe ended in the late

23

00:01:16,190 --> 00:01:12,390

1990s or continues through the early

24

00:01:18,859 --> 00:01:16,200

21st century but the temperature records

25

00:01:25,060 --> 00:01:18,869

have been changed it didn't use to show

26

00:01:26,960 --> 00:01:25,070

any warming from say 2002 to 2014 and

27

00:01:28,580 --> 00:01:26,970

don't ask me why

28

00:01:31,609 --> 00:01:28,590

whenever these temperature records are

29

00:01:33,590 --> 00:01:31,619

changed they become colder in the early

30

00:01:35,990 --> 00:01:33,600

years and sometimes warmer in the later

31

00:01:38,270 --> 00:01:36,000

years so the warming trend gets greater

32

00:01:41,390 --> 00:01:38,280

from the same data if you can believe

33

00:01:45,080 --> 00:01:41,400

that and when you say changed changed by

34

00:01:48,289 --> 00:01:45,090

whom in this case our National Oceanic

35

00:01:50,030 --> 00:01:48,299

and Atmospheric Administration that's a

36

00:01:51,590 --> 00:01:50,040

National Climatic Data Center also known

37

00:01:52,969 --> 00:01:51,600

as the National centers for

38

00:01:55,819 --> 00:01:52,979

environmental information

39

00:01:58,310 --> 00:01:55,829

- climate and they're saying that what

40

00:02:00,679 --> 00:01:58,320

was regionally reported as the

41

00:02:02,389 --> 00:02:00,689

temperatures for those years turns out

42

00:02:04,459 --> 00:02:02,399

to have been wrong and we're now

43

00:02:06,109 --> 00:02:04,469

correcting it and we're showing that

44

00:02:09,740 --> 00:02:06,119

actually it was warming more than we

45

00:02:13,300 --> 00:02:09,750

first reported yes and we corrected it

46

00:02:18,160 --> 00:02:16,330

we used to take these sea surface

47

00:02:20,290 --> 00:02:18,170

temperatures measured by satellite

48

00:02:24,340 --> 00:02:20,300

satellites are good the universal

49

00:02:29,140 --> 00:02:24,350

coverage you know their biases and

50

00:02:32,400 --> 00:02:29,150

everything else and we switched to a

51
00:02:35,260 --> 00:02:32,410
network of drifting buoys and

52
00:02:37,150 --> 00:02:35,270
temperatures taken on board ship on the

53
00:02:39,370 --> 00:02:37,160
intake tubes of shift and you can you

54
00:02:41,590 --> 00:02:39,380
can wonder how good those temperatures

55
00:02:44,350 --> 00:02:41,600
from ships are the ship heats up and up

56
00:02:46,600 --> 00:02:44,360
in the Sun the intake tube can be deep

57
00:02:49,270 --> 00:02:46,610
on a big ship it can be shallow on a

58
00:02:53,080 --> 00:02:49,280
small ship and the tests of the

59
00:02:57,640 --> 00:02:53,090
temperatures are really the very suspect

60
00:03:01,360 --> 00:02:57,650
and then it was discovered that the buoy

61
00:03:02,920 --> 00:03:01,370
data ran cooler than the ship data so

62
00:03:06,010 --> 00:03:02,930
what did our government do in its

63
00:03:10,210 --> 00:03:06,020

infinite wisdom it adjusted the buoy

64

00:03:12,729 --> 00:03:10,220

data upward to match the ship data so

65

00:03:16,120 --> 00:03:12,739

here's the cool part we're putting out

66

00:03:19,090 --> 00:03:16,130

more and more buoys over the course of

67

00:03:20,979 --> 00:03:19,100

say this century and so that means you

68

00:03:23,530 --> 00:03:20,989

have more and more data that's

69

00:03:25,750 --> 00:03:23,540

artificially adjusted upward that was

70

00:03:28,300 --> 00:03:25,760

guaranteed i underscore the word

71

00:03:31,120 --> 00:03:28,310

guaranteed to put a warming trend in the

72

00:03:34,479 --> 00:03:31,130

data and as you believe that this was

73

00:03:38,610 --> 00:03:34,489

politically motivated I don't know I

74

00:03:41,680 --> 00:03:38,620

mean the the the national center for

75

00:03:46,509 --> 00:03:41,690

environmental information - climate in

76

00:03:50,800 --> 00:03:46,519

Asheville has a past I can give you an

77

00:03:52,900 --> 00:03:50,810

example their head is a guy by the name

78

00:03:58,390 --> 00:03:52,910

of Tom Karl who's a very nice fellow

79

00:04:01,090 --> 00:03:58,400

very bright and he was in charge of the

80

00:04:03,069 --> 00:04:01,100

first National Climate Assessment this

81

00:04:05,199 --> 00:04:03,079

is a thing that comes out every four

82

00:04:07,259 --> 00:04:05,209

years unless there's a Republican in

83

00:04:11,819 --> 00:04:07,269

office and then it doesn't come out and

84

00:04:15,190 --> 00:04:11,829

the first one came out in 2000 between

85

00:04:19,030 --> 00:04:15,200

the during the whole election tussle in

86

00:04:23,469 --> 00:04:19,040

December of November of that year and I

87

00:04:26,570 --> 00:04:23,479

was reviewer and I looked at the models

88

00:04:28,879 --> 00:04:26,580

that they were using to project

89

00:04:31,309 --> 00:04:28,889

the future climate for the 21st century

90

00:04:34,790 --> 00:04:31,319

and I asked the models a very simple

91

00:04:37,189 --> 00:04:34,800

question can you reproduce 10 year

92

00:04:43,820 --> 00:04:37,199

running means of temperature beginning

93

00:04:47,360 --> 00:04:43,830

in 1900 in other words 1900 to 1909 1901

94

00:04:51,170 --> 00:04:47,370

to 1910 etc all the way on up to the end

95

00:04:54,379 --> 00:04:51,180

of the 20th century and what happened

96

00:04:56,629 --> 00:04:54,389

when he applied the model to the data is

97

00:04:59,120 --> 00:04:56,639

it put more noise in the data than was

98

00:05:01,460 --> 00:04:59,130

in the raw data that seems impossible

99

00:05:05,420 --> 00:05:01,470

that is precisely the same thing as

100

00:05:07,760 --> 00:05:05,430

giving a student a 4-part for choice

101

00:05:10,129 --> 00:05:07,770

multiple choice tests and having the

102

00:05:12,950 --> 00:05:10,139

student get less than 25 percent correct

103

00:05:15,980 --> 00:05:12,960

it's negative knowledge so I brought

104

00:05:17,899 --> 00:05:15,990

that to Tom Carroll I said it hey Tom I

105

00:05:20,510 --> 00:05:17,909

just wanted to give you a heads up that

106

00:05:22,999 --> 00:05:20,520

this is what I found and this is what we

107

00:05:26,659 --> 00:05:23,009

did for 10 year running means and he

108

00:05:28,820 --> 00:05:26,669

wrote back to me an email and said ok

109

00:05:31,760 --> 00:05:28,830

well we just didn't use to we did the

110

00:05:36,999 --> 00:05:31,770

same thing and we can just use 10 year

111

00:05:42,200 --> 00:05:37,009

running means we use 1 5 10 20 and 25

112

00:05:44,689 --> 00:05:42,210

and in each case in each and every case

113

00:05:49,159 --> 00:05:44,699

the model added more noise to the data

114

00:05:53,240 --> 00:05:49,169

than was in the raw data and I said Tom

115

00:05:57,649 --> 00:05:53,250

you can't use that and you know using

116

00:06:03,620 --> 00:05:57,659

that to guide policy is exactly

117

00:06:04,550 --> 00:06:03,630

analogous to giving ritalin to a patient

118

00:06:07,969 --> 00:06:04,560

with high blood pressure

119

00:06:12,260 --> 00:06:07,979

for high blood pressure it's malpractice

120

00:06:14,990 --> 00:06:12,270

and that it went through and the second

121

00:06:18,350 --> 00:06:15,000

National Assessment had even greater

122

00:06:20,209 --> 00:06:18,360

problems and third one was billed as a

123

00:06:22,909 --> 00:06:20,219

political document by the Obama

124

00:06:24,649 --> 00:06:22,919

administration I think there's a lot of

125

00:06:26,409 --> 00:06:24,659

shenanigans that are going on on this

126
00:06:30,170 --> 00:06:26,419
issue

127
00:06:32,689 --> 00:06:30,180
what's your a climate change skeptic yet

128
00:06:34,639 --> 00:06:32,699
no I'm not a climate change skeptic ok

129
00:06:37,370 --> 00:06:34,649
how did how could you say I believe in

130
00:06:39,800 --> 00:06:37,380
climate change I know that climate is

131
00:06:42,470 --> 00:06:39,810
not a stationary variable

132
00:06:45,020 --> 00:06:42,480
I'm pretty sure that people have

133
00:06:48,610 --> 00:06:45,030
something to do with the changes that

134
00:06:52,100 --> 00:06:48,620
have been observed beginning in the late

135
00:06:54,050 --> 00:06:52,110
20th century well could be because yeah

136
00:06:55,160 --> 00:06:54,060
that's actually was gonna be my point is

137
00:06:56,270 --> 00:06:55,170
that even though I'm calling you a

138
00:06:57,380 --> 00:06:56,280

climate change skeptic and you're

139

00:06:59,630 --> 00:06:57,390

disagreeing with that but yeah I wanted

140

00:07:02,360 --> 00:06:59,640

to make the point that you do believe

141

00:07:04,160 --> 00:07:02,370

that there has been warming and that

142

00:07:07,520 --> 00:07:04,170

that warming has been caused at least in

143

00:07:09,170 --> 00:07:07,530

part by humans so right yeah so maybe a

144

00:07:12,409 --> 00:07:09,180

good starting point though because I

145

00:07:15,290 --> 00:07:12,419

don't even understand that and not being

146

00:07:18,760 --> 00:07:15,300

an expert I'm even skeptical of that so

147

00:07:21,860 --> 00:07:18,770

well I'll tell you why I say that yeah

148

00:07:24,980 --> 00:07:21,870

the great philosophers science Karl

149

00:07:28,159 --> 00:07:24,990

Popper allow that if you have a theory

150

00:07:30,470 --> 00:07:28,169

and it makes what are difficult

151

00:07:31,850 --> 00:07:30,480

predictions and you can verify those

152

00:07:34,310 --> 00:07:31,860

different predictions you should be able

153

00:07:37,280 --> 00:07:34,320

to continue to entertain your hypotheses

154

00:07:40,520 --> 00:07:37,290

for example the fact that gravity would

155

00:07:42,260 --> 00:07:40,530

bend why according to Einstein that was

156

00:07:46,100 --> 00:07:42,270

a difficult all theory and it turns out

157

00:07:50,180 --> 00:07:46,110

in the 1919 Eclipse that was testable

158

00:07:52,490 --> 00:07:50,190

and in fact it happened so the difficult

159

00:07:55,159 --> 00:07:52,500

prediction of climate models of the

160

00:07:58,460 --> 00:07:55,169

greenhouse theory is that the

161

00:07:59,140 --> 00:07:58,470

stratospheric temperature goes down not

162

00:08:01,969 --> 00:07:59,150

up

163

00:08:04,550 --> 00:08:01,979

because the greenhouse gases are

164

00:08:06,380 --> 00:08:04,560

trapping and reradiating radiation

165

00:08:08,300 --> 00:08:06,390

mostly in the lower atmosphere so the

166

00:08:12,140 --> 00:08:08,310

flux through the stratosphere is

167

00:08:14,510 --> 00:08:12,150

different and indeed if you look at

168

00:08:16,280 --> 00:08:14,520

satellite since temperatures

169

00:08:18,650 --> 00:08:16,290

stratosphere

170

00:08:24,110 --> 00:08:18,660

they drop beginning in the record in

171

00:08:25,700 --> 00:08:24,120

1979 and then an odd thing happens when

172

00:08:29,510 --> 00:08:25,710

the warming of the twentieth century

173

00:08:33,250 --> 00:08:29,520

century appeared to have slowed down or

174

00:08:34,969 --> 00:08:33,260

stopped in the late 20th century the

175

00:08:39,800 --> 00:08:34,979

stratospheric temperature stopped

176

00:08:42,230 --> 00:08:39,810

cooling - and what caused that three

177

00:08:45,340 --> 00:08:42,240

most important words in the science are

178

00:08:49,520 --> 00:08:45,350

I don't know I don't think anybody does

179

00:08:52,070 --> 00:08:49,530

but that correlation to you tends to

180

00:08:53,510 --> 00:08:52,080

tell you that yes there's something

181

00:08:57,650 --> 00:08:53,520

going on

182

00:09:01,910 --> 00:08:57,660

stratosphere cooling is very telling so

183

00:09:04,130 --> 00:09:01,920

that let me get my globe here and bring

184

00:09:06,770 --> 00:09:04,140

it into view for people because some

185

00:09:07,670 --> 00:09:06,780

sometimes you know you have scientists

186

00:09:09,290 --> 00:09:07,680

that are all over the map you have

187

00:09:10,910 --> 00:09:09,300

competing theories and as you say you

188

00:09:13,510 --> 00:09:10,920

can't even trust the data it necessarily

189

00:09:16,850 --> 00:09:13,520

so for me sometimes I like to just use

190

00:09:18,980 --> 00:09:16,860

basic common sense and then see how that

191

00:09:20,630 --> 00:09:18,990

applies and so one thing I like to talk

192

00:09:23,150 --> 00:09:20,640

about is looking at a globe and first of

193

00:09:25,880 --> 00:09:23,160

all you recognize that what is it 75% is

194

00:09:28,490 --> 00:09:25,890

water you know 72 I think something like

195

00:09:33,770 --> 00:09:28,500

72 percent right 72 percent is water

196

00:09:37,490 --> 00:09:33,780

and then you've got barren land over 90

197

00:09:40,580 --> 00:09:37,500

percent of the land that's there what do

198

00:09:44,170 --> 00:09:40,590

you mean by barren nothing there no no

199

00:09:47,170 --> 00:09:44,180

industry nothing that's creating

200

00:09:50,420 --> 00:09:47,180

greenhouse gases that is not natural

201
00:09:54,140 --> 00:09:50,430
right most of the most of the occupied

202
00:09:56,480 --> 00:09:54,150
land is is I mean industrial itit's land

203
00:09:58,940 --> 00:09:56,490
is in the middle attitudes some in the

204
00:10:00,950 --> 00:09:58,950
tropics very little in the southern

205
00:10:03,800 --> 00:10:00,960
hemisphere so I was thinking that you

206
00:10:07,370 --> 00:10:03,810
could take needles and just stick them

207
00:10:10,100 --> 00:10:07,380
in this globe in the various points

208
00:10:12,830 --> 00:10:10,110
where there's some serious stuff being

209
00:10:15,140 --> 00:10:12,840
shot up into the atmosphere and you

210
00:10:18,320 --> 00:10:15,150
would probably you could probably stick

211
00:10:20,710 --> 00:10:18,330
maybe 50 needles in this thing where

212
00:10:24,080 --> 00:10:20,720
they were there's serious urban centers

213
00:10:26,030 --> 00:10:24,090

if you if you had these 50 needles in

214

00:10:28,430 --> 00:10:26,040

here where there's the serious things

215

00:10:31,250 --> 00:10:28,440

being pumped up into this guy you would

216

00:10:33,290 --> 00:10:31,260

still have a globe that is pretty much

217

00:10:35,810 --> 00:10:33,300

empty so just it's just hard for me to

218

00:10:37,790 --> 00:10:35,820

believe that these little needles where

219

00:10:41,660 --> 00:10:37,800

little puffs of smoke are coming out of

220

00:10:44,810 --> 00:10:41,670

in this huge globe again made up mostly

221

00:10:46,430 --> 00:10:44,820

of water is somehow having the effect of

222

00:10:48,920 --> 00:10:46,440

getting trapped and by the way I don't

223

00:10:51,620 --> 00:10:48,930

know how far away using my hands how far

224

00:10:55,250 --> 00:10:51,630

away would it have been trapped from

225

00:10:58,760 --> 00:10:55,260

this globe uh-huh oh no no we're near

226

00:11:01,640 --> 00:10:58,770

that far super slide up to up basically

227

00:11:04,090 --> 00:11:01,650

the main change is in the troposphere so

228

00:11:06,200 --> 00:11:04,100

that would be probably in the bottom

229

00:11:06,530 --> 00:11:06,210

quarter of an inch or something like

230

00:11:07,170 --> 00:11:06,540

that

231

00:11:08,910 --> 00:11:07,180

so about

232

00:11:12,000 --> 00:11:08,920

quarter of an inch off of this globe

233

00:11:14,900 --> 00:11:12,010

would be where the this where the gases

234

00:11:19,170 --> 00:11:14,910

are getting are getting trapped so

235

00:11:23,010 --> 00:11:19,180

that's a very you know fifth-grade

236

00:11:24,840 --> 00:11:23,020

analysis of of what's happening and glow

237

00:11:26,070 --> 00:11:24,850

but you're telling me that yes Jim

238

00:11:27,900 --> 00:11:26,080

believe it or not I know it's hard to

239

00:11:29,820 --> 00:11:27,910

believe but those little puffs of smoke

240

00:11:32,070 --> 00:11:29,830

coming out of those 50 spots on the

241

00:11:33,540 --> 00:11:32,080

globe are warming us well a lot of those

242

00:11:37,130 --> 00:11:33,550

little puffs of smoke are called

243

00:11:41,850 --> 00:11:37,140

automobiles and they're pretty mobile

244

00:11:43,530 --> 00:11:41,860

but more importantly the source for

245

00:11:47,480 --> 00:11:43,540

increased carbon dioxide in the

246

00:11:51,270 --> 00:11:47,490

atmosphere is almost exclusively the

247

00:11:55,140 --> 00:11:51,280

combustion of fossil fuels and fossil

248

00:12:01,100 --> 00:11:55,150

fuels being old have a different ratio

249

00:12:07,890 --> 00:12:01,110

of the isotope carbon 13 to the normal

250

00:12:11,850 --> 00:12:07,900

generic carbon 12 and by looking at time

251

00:12:14,640 --> 00:12:11,860

history of the ratio of c-13 the c12 in

252

00:12:17,250 --> 00:12:14,650

the atmosphere you can determine whether

253

00:12:19,290 --> 00:12:17,260

in fact fossil carbon is getting in the

254

00:12:21,810 --> 00:12:19,300

atmosphere and yes it is and it's

255

00:12:23,070 --> 00:12:21,820

getting an amounts that are consistent

256

00:12:25,410 --> 00:12:23,080

with the concentrations that are being

257

00:12:31,460 --> 00:12:25,420

observed so yeah that's real here's a

258

00:12:33,870 --> 00:12:31,470

point when you look at this issue

259

00:12:35,730 --> 00:12:33,880

oftentimes people say there are two

260

00:12:37,590 --> 00:12:35,740

points of view on this the Los Angeles

261

00:12:41,850 --> 00:12:37,600

Times point of view the world's coming

262

00:12:43,620 --> 00:12:41,860

to an end or the point of view there's

263

00:12:45,300 --> 00:12:43,630

no such thing there's no such thing as

264

00:12:47,940 --> 00:12:45,310

an enhanced greenhouse effect

265

00:12:51,780 --> 00:12:47,950

carbon dioxide doesn't have much of an

266

00:12:55,200 --> 00:12:51,790

effect there's a third ground which is

267

00:12:59,100 --> 00:12:55,210

yeah the basic science is probably

268

00:13:01,080 --> 00:12:59,110

pretty good but the details we probably

269

00:13:02,760 --> 00:13:01,090

would do better by letting nature fill

270

00:13:05,550 --> 00:13:02,770

in the detail seen as we've been putting

271

00:13:07,260 --> 00:13:05,560

this stuff in the atmosphere in

272

00:13:14,450 --> 00:13:07,270

considerable quantities since World War

273

00:13:19,260 --> 00:13:14,460

two so Nature has had 70 years to

274

00:13:20,970 --> 00:13:19,270

declare how it responds to us enhancing

275

00:13:25,319 --> 00:13:20,980

the carbon dioxide concentration of the

276

00:13:28,980 --> 00:13:25,329

figure and frankly the response is not

277

00:13:31,410 --> 00:13:28,990

that good it looks at the wall to be at

278

00:13:34,560 --> 00:13:31,420

the low end of the projections that are

279

00:13:36,420 --> 00:13:34,570

made by all these climate models is the

280

00:13:39,000 --> 00:13:36,430

kind of the name of John Christie it was

281

00:13:42,150 --> 00:13:39,010

sort of the father of the climate

282

00:13:43,350 --> 00:13:42,160

University of Alabama in Huntsville and

283

00:13:47,610 --> 00:13:43,360

he was testifying in front of Congress

284

00:13:51,360 --> 00:13:47,620

he's testified several times and he

285

00:13:54,870 --> 00:13:51,370

showed the performance of the models

286

00:13:56,670 --> 00:13:54,880

versus reality and you're gonna see a

287

00:14:02,040 --> 00:13:56,680

picture of this that we're gonna present

288

00:14:04,889 --> 00:14:02,050

to you what you see is a a solid line

289

00:14:09,000 --> 00:14:04,899

that is the average temperature change

290

00:14:11,490 --> 00:14:09,010

predicted by these models for what we

291

00:14:13,769 --> 00:14:11,500

call the free troposphere say from 5000

292

00:14:17,519 --> 00:14:13,779

feet on up to 30,000 feet in the

293

00:14:19,319 --> 00:14:17,529

atmosphere and then there's a whole

294

00:14:21,660 --> 00:14:19,329

bunch of colored spaghetti on this chart

295

00:14:24,329 --> 00:14:21,670

and the colored spaghetti is each one of

296

00:14:27,470 --> 00:14:24,339

these 32 different model families and

297

00:14:29,400 --> 00:14:27,480

then much further down on the chart our

298

00:14:30,980 --> 00:14:29,410

satellite temperatures temperatures

299

00:14:32,579 --> 00:14:30,990

measured by weather balloons and

300

00:14:34,949 --> 00:14:32,589

temperatures measured by something

301
00:14:37,650 --> 00:14:34,959
called reanalysis of synoptic data I

302
00:14:40,610 --> 00:14:37,660
won't go into what that is but you can

303
00:14:42,530 --> 00:14:40,620
see all those three sources of real data

304
00:14:46,710 --> 00:14:42,540
look the same

305
00:14:49,019 --> 00:14:46,720
and they are very far apart in their

306
00:14:53,730 --> 00:14:49,029
warming from when the record starts in

307
00:14:56,189 --> 00:14:53,740
1979 to now very far apart from what the

308
00:14:58,620 --> 00:14:56,199
satellite spaghetti shows but if you

309
00:15:01,470 --> 00:14:58,630
look carefully you'll see that there's

310
00:15:05,579 --> 00:15:01,480
one piece of spaghetti then in fact

311
00:15:07,980 --> 00:15:05,589
matches what's being observed and again

312
00:15:10,319 --> 00:15:07,990
call the special prosecutor because it's

313
00:15:12,480 --> 00:15:10,329

the Russian model Russian model is

314

00:15:18,840 --> 00:15:12,490

obviously in collusion with the data and

315

00:15:21,870 --> 00:15:18,850

so if we were following best scientific

316

00:15:24,689 --> 00:15:21,880

practice on global warming what we would

317

00:15:27,269 --> 00:15:24,699

do is we would use the Russian model as

318

00:15:28,139 --> 00:15:27,279

the backbone of our projections that's

319

00:15:32,220 --> 00:15:28,149

what happens in weather forecasting

320

00:15:34,170 --> 00:15:32,230

every day I think their Russian sorry to

321

00:15:34,800 --> 00:15:34,180

be clear the Russian model so far has

322

00:15:37,620 --> 00:15:34,810

been doing the

323

00:15:39,900 --> 00:15:37,630

best job at [h__h] at predictive our

324

00:15:42,660 --> 00:15:39,910

and it has less warming in it than any

325

00:15:44,700 --> 00:15:42,670

of the others fine by the way what what

326

00:15:47,820 --> 00:15:44,710

do the Russians generally say when they

327

00:15:49,410 --> 00:15:47,830

go to the various climate summits in

328

00:15:52,680 --> 00:15:49,420

Paris etc what has been the position

329

00:15:56,579 --> 00:15:52,690

I've never I've never mmm the Russian

330

00:16:00,870 --> 00:15:56,589

modelers I don't know however so you cut

331

00:16:05,460 --> 00:16:00,880

out you say virgin the the old one was

332

00:16:08,250 --> 00:16:05,470

acronym IMF TM for and again it has the

333

00:16:15,090 --> 00:16:08,260

least warming of all the 32 families of

334

00:16:17,460 --> 00:16:15,100

models if if left to its own devices it

335

00:16:19,710 --> 00:16:17,470

probably would predict about one point

336

00:16:22,769 --> 00:16:19,720

six degrees of warming over the course

337

00:16:25,040 --> 00:16:22,779

of the 21st century that's not enough

338

00:16:28,019 --> 00:16:25,050

for anybody to really get excited about

339

00:16:32,400 --> 00:16:28,029

but they had out had a new version I an

340

00:16:36,110 --> 00:16:32,410

MC m5 and guess what Ryan MC m5

341

00:16:39,390 --> 00:16:36,120

independently simulates the pause the

342

00:16:41,490 --> 00:16:39,400

slowdown or stopping of warming that

343

00:16:43,290 --> 00:16:41,500

occurred beginning in the late 20th

344

00:16:46,530 --> 00:16:43,300

century and then it extended through

345

00:16:49,860 --> 00:16:46,540

about 2014 that's very interesting to me

346

00:16:52,950 --> 00:16:49,870

that it does that independently and it

347

00:16:56,579 --> 00:16:52,960

does it by by having a fairly strong

348

00:16:59,400 --> 00:16:56,589

component of solar variability in it if

349

00:17:01,380 --> 00:16:59,410

we were using best practice again that's

350

00:17:04,169 --> 00:17:01,390

the model we would use I'll give you an

351
00:17:06,240 --> 00:17:04,179
example of how best practice works every

352
00:17:08,699 --> 00:17:06,250
day when the weather forecast comes out

353
00:17:09,960 --> 00:17:08,709
from the National Weather Service they

354
00:17:11,970 --> 00:17:09,970
have eight models to choose from

355
00:17:14,309 --> 00:17:11,980
globally they don't take all eight

356
00:17:16,590 --> 00:17:14,319
models and average them up let's say AHA

357
00:17:18,929 --> 00:17:16,600
that's the forecast but that's what

358
00:17:21,870 --> 00:17:18,939
we're doing in climate we take all four

359
00:17:23,910 --> 00:17:21,880
32 families of models and average them

360
00:17:26,929 --> 00:17:23,920
up even though the Russian one is very

361
00:17:30,210 --> 00:17:26,939
cool the rest of them are so warm that

362
00:17:32,880 --> 00:17:30,220
using that is guaranteed to predict too

363
00:17:35,430 --> 00:17:32,890

much warming and then we take all the

364

00:17:42,750 --> 00:17:35,440

effects downstream effects from those

365

00:17:45,570 --> 00:17:42,760

projected changes and things like

366

00:17:48,450 --> 00:17:45,580

changes in agriculture etc and I assure

367

00:17:50,490 --> 00:17:48,460

you that the

368

00:17:53,220 --> 00:17:50,500

a view of those models should give one

369

00:17:55,200 --> 00:17:53,230

cause another example and I'll show you

370

00:18:00,240 --> 00:17:55,210

another picture here this one's a little

371

00:18:03,030 --> 00:18:00,250

more complicated but this is now in the

372

00:18:05,430 --> 00:18:03,040

vertical so the bottom of the graph is

373

00:18:07,530 --> 00:18:05,440

at the surface and on the top of the

374

00:18:09,740 --> 00:18:07,540

graph is up about fifty or sixty

375

00:18:12,660 --> 00:18:09,750

thousand feet in the atmosphere and

376

00:18:16,890 --> 00:18:12,670

these are the this colored spaghetti is

377

00:18:18,840 --> 00:18:16,900

the warming rate predicted by all the

378

00:18:22,920 --> 00:18:18,850

different families of models and you can

379

00:18:26,190 --> 00:18:22,930

see again in the reality are these dots

380

00:18:29,130 --> 00:18:26,200

on the left-hand side of the chart those

381

00:18:31,260 --> 00:18:29,140

are the weather balloon data for

382

00:18:32,360 --> 00:18:31,270

different sets of them averaged up at

383

00:18:35,100 --> 00:18:32,370

different levels in the atmosphere

384

00:18:39,000 --> 00:18:35,110

that's a good data set to use because

385

00:18:40,740 --> 00:18:39,010

when you take whether you discover that

386

00:18:43,320 --> 00:18:40,750

when you launch a weather balloon you

387

00:18:45,600 --> 00:18:43,330

have to calibrate the thermistor before

388

00:18:49,350 --> 00:18:45,610

you let it loose so these gonna be good

389

00:18:53,040 --> 00:18:49,360

data and again the warming rates that

390

00:18:55,320 --> 00:18:53,050

are predicted are much higher than

391

00:18:58,350 --> 00:18:55,330

what's being observed when you get on up

392

00:19:02,520 --> 00:18:58,360

to about 40,000 feet in the atmosphere

393

00:19:04,290 --> 00:19:02,530

the predicted warming rate is seven

394

00:19:07,560 --> 00:19:04,300

times did you hear no it's not seven

395

00:19:12,060 --> 00:19:07,570

tenths seven times what's being observed

396

00:19:14,310 --> 00:19:12,070

now why is that important because in the

397

00:19:15,930 --> 00:19:14,320

this is in the tropics this is from 20

398

00:19:18,000 --> 00:19:15,940

degrees north to 20 degrees south

399

00:19:21,150 --> 00:19:18,010

almost all the moisture that the world

400

00:19:23,220 --> 00:19:21,160

depends upon for agriculture comes from

401
00:19:26,970 --> 00:19:23,230
evaporation from the tropical oceans and

402
00:19:30,560 --> 00:19:26,980
so you will get that long if you get the

403
00:19:32,670 --> 00:19:30,570
vertical temperature wrong because the

404
00:19:34,080 --> 00:19:32,680
vertical temperature determines how much

405
00:19:36,840 --> 00:19:34,090
upward motion there is in the atmosphere

406
00:19:39,120 --> 00:19:36,850
Sosa determines how the big

407
00:19:41,340 --> 00:19:39,130
thunderstorms can inject moisture in the

408
00:19:44,220 --> 00:19:41,350
atmosphere which then is transported

409
00:19:47,610 --> 00:19:44,230
towards the poles so if you get that

410
00:19:49,320 --> 00:19:47,620
wrong everything else falls apart these

411
00:19:53,070 --> 00:19:49,330
forecasts you're gonna make for

412
00:19:54,990 --> 00:19:53,080
agriculture you if you got the

413
00:19:57,240 --> 00:19:55,000

precipitation right you got it right for

414

00:19:58,950 --> 00:19:57,250

the wrong reason because the place where

415

00:20:01,530 --> 00:19:58,960

all the moisture comes from was modeled

416

00:20:02,310 --> 00:20:01,540

incorrectly this is a very serious

417

00:20:04,590 --> 00:20:02,320

problem

418

00:20:08,100 --> 00:20:04,600

and by the way looking at that chart

419

00:20:10,080 --> 00:20:08,110

again I want to look closely there's one

420

00:20:13,259 --> 00:20:10,090

piece of colored spaghetti that get it

421

00:20:16,860 --> 00:20:13,269

gets it right in the vertical as far as

422

00:20:18,779 --> 00:20:16,870

other potential causes let's talk about

423

00:20:20,610 --> 00:20:18,789

the ocean for a second because we talked

424

00:20:23,220 --> 00:20:20,620

about it being 72% you've got ocean

425

00:20:26,340 --> 00:20:23,230

currents and microbes that live in the

426

00:20:27,960 --> 00:20:26,350

ocean and and so forth I mean do you

427

00:20:29,279 --> 00:20:27,970

think the ocean there could be something

428

00:20:31,740 --> 00:20:29,289

going on with our oceans that's causing

429

00:20:35,820 --> 00:20:31,750

these changes no it would be the other

430

00:20:40,980 --> 00:20:35,830

way around and there is always this

431

00:20:45,629 --> 00:20:40,990

question where is the heat going in the

432

00:20:47,220 --> 00:20:45,639

ocean if it's in the surface okay that's

433

00:20:50,490 --> 00:20:47,230

gonna have a strong interaction with the

434

00:20:52,619 --> 00:20:50,500

atmosphere if the heat that we put in

435

00:20:55,399 --> 00:20:52,629

there mixes way down into the deep ocean

436

00:20:58,289 --> 00:20:55,409

I don't really care

437

00:21:00,539 --> 00:20:58,299

it'll take incredibly long time to get

438

00:21:02,820 --> 00:21:00,549

out of there and by that time

439

00:21:07,710 --> 00:21:02,830

god knows what civilization is gonna

440

00:21:11,970 --> 00:21:07,720

resemble so the oceans the warming of

441

00:21:14,759 --> 00:21:11,980

the oceans is a little problematical but

442

00:21:17,610 --> 00:21:14,769

it it is occurring again I'd like to

443

00:21:18,659 --> 00:21:17,620

emphasize one word in my discussion of

444

00:21:22,560 --> 00:21:18,669

this which is lukewarm

445

00:21:25,379 --> 00:21:22,570

I think the planet is luke warming yeah

446

00:21:30,299 --> 00:21:25,389

the temperature's going up in fits and

447

00:21:35,310 --> 00:21:30,309

starts probably but it doesn't appear to

448

00:21:38,639 --> 00:21:35,320

be on the trajectory that would really

449

00:21:40,049 --> 00:21:38,649

cause a major issue again taking a look

450

00:21:42,799 --> 00:21:40,059

at that colored spaghetti you can see

451
00:21:45,299 --> 00:21:42,809
the Russian model is the coldest one

452
00:21:47,129 --> 00:21:45,309
it's the one that seems to match both in

453
00:21:52,350 --> 00:21:47,139
the vertical and in bulk

454
00:21:54,119 --> 00:21:52,360
tropical purpose fear so yeah is it is

455
00:21:55,440 --> 00:21:54,129
it your belief that the Russian model is

456
00:21:58,710 --> 00:21:55,450
the most accurate because it's perhaps

457
00:22:06,090 --> 00:21:58,720
the least politicized I'll have no idea

458
00:22:09,419 --> 00:22:06,100
I have no idea I do know that the heat

459
00:22:11,220 --> 00:22:09,429
capacity of the ocean the amount of

460
00:22:14,730 --> 00:22:11,230
temperature change you get for a given

461
00:22:16,000 --> 00:22:14,740
change in radiation is twice as much as

462
00:22:19,360 --> 00:22:16,010
it is in the other model

463
00:22:21,520 --> 00:22:19,370

and that's interesting because then

464

00:22:24,100 --> 00:22:21,530

everything's gonna warm up a lot more

465

00:22:27,880 --> 00:22:24,110

slowly and some of the warming is gonna

466

00:22:32,560 --> 00:22:27,890

really be attenuated and that seems to

467

00:22:34,570 --> 00:22:32,570

be what's being observed okay let's go

468

00:22:37,150 --> 00:22:34,580

back to the LA Times thing and address

469

00:22:39,580 --> 00:22:37,160

some of the things in there the changing

470

00:22:42,070 --> 00:22:39,590

climate is no longer an abstract threat

471

00:22:46,240 --> 00:22:42,080

lurking in our distant future it is upon

472

00:22:48,370 --> 00:22:46,250

us we feel it we see it in our longer in

473

00:22:50,799 --> 00:22:48,380

deeper droughts in in our brutal

474

00:22:51,659 --> 00:22:50,809

hurricanes and raging hyper destructive

475

00:22:56,380 --> 00:22:51,669

wildfires

476
00:22:59,560 --> 00:22:56,390
wow what a bunch of of overblown and

477
00:23:02,020 --> 00:22:59,570
false rhetoric here I got another chart

478
00:23:07,690 --> 00:23:02,030
for ya will you explain let me explain

479
00:23:09,370 --> 00:23:07,700
before we throw it up in 1970 satellite

480
00:23:13,090 --> 00:23:09,380
coverage weather satellite coverage

481
00:23:16,570 --> 00:23:13,100
became global and so that means that we

482
00:23:20,860 --> 00:23:16,580
can see every hurricane tropical cyclone

483
00:23:22,870 --> 00:23:20,870
on the planet since 1970 we can get

484
00:23:26,850 --> 00:23:22,880
really good estimates of how strong they

485
00:23:30,520 --> 00:23:26,860
are and a guy by the name of Ryan Maui

486
00:23:33,970 --> 00:23:30,530
has been doing this for years publishes

487
00:23:37,650 --> 00:23:33,980
that and you take you take the

488
00:23:40,690 --> 00:23:37,660

Hurricanes and their wind speed and

489

00:23:42,700 --> 00:23:40,700

multiplied the two the multiply the wind

490

00:23:45,990 --> 00:23:42,710

speed times time and you get the power

491

00:23:51,100 --> 00:23:46,000

of hurricanes global power of hurricanes

492

00:23:53,340 --> 00:23:51,110

so here's a chart of what he calls the

493

00:23:57,039 --> 00:23:53,350

accumulated cyclone energy index

494

00:24:00,730 --> 00:23:57,049

beginning in 1970 and what do you see

495

00:24:03,430 --> 00:24:00,740

you don't see any trend at all no trend

496

00:24:07,450 --> 00:24:03,440

whatsoever no relationship with mean

497

00:24:09,070 --> 00:24:07,460

surface temperature what so ever oh yeah

498

00:24:14,770 --> 00:24:09,080

we have computer models that say that

499

00:24:17,440 --> 00:24:14,780

hurricanes should produce more rain but

500

00:24:20,049 --> 00:24:17,450

they also say the signal won't come out

501
00:24:21,690 --> 00:24:20,059
of the noise until about 2080 that's a

502
00:24:24,399 --> 00:24:21,700
pretty long time from now

503
00:24:28,560 --> 00:24:24,409
so yeah no there's no there's nothing

504
00:24:29,680 --> 00:24:28,570
thing is just a dead letter drought in

505
00:24:37,409 --> 00:24:29,690
he

506
00:24:45,610 --> 00:24:42,249
wildfires again in California we have

507
00:24:48,220 --> 00:24:45,620
years long periods of below normal

508
00:24:50,980 --> 00:24:48,230
precipitation years long periods of fire

509
00:24:54,490 --> 00:24:50,990
above normal precipitation if you take a

510
00:24:58,840 --> 00:24:54,500
look in the early 20th century it was

511
00:25:03,220 --> 00:24:58,850
extremely rainy when the large migration

512
00:25:05,440 --> 00:25:03,230
from the east people looking for golden

513
00:25:08,950 --> 00:25:05,450

sight California came in I imagine it

514

00:25:12,100 --> 00:25:08,960

was green fairly far into the summer but

515

00:25:14,680 --> 00:25:12,110

here's the thing about California and

516

00:25:20,169 --> 00:25:14,690

you can you can you can quote Clifford

517

00:25:22,570 --> 00:25:20,179

Moss professor Moss M a SS I believe

518

00:25:26,710 --> 00:25:22,580

from University of Washington Department

519

00:25:29,110 --> 00:25:26,720

of meteorology every year California

520

00:25:32,710 --> 00:25:29,120

gets extremely dry at the end of summer

521

00:25:34,269 --> 00:25:32,720

it doesn't matter whether the rainfall

522

00:25:35,080 --> 00:25:34,279

in the winter previous winter was above

523

00:25:37,600 --> 00:25:35,090

or below normal

524

00:25:43,480 --> 00:25:37,610

it gets to the threshold where it's

525

00:25:49,149 --> 00:25:43,490

ignites very very easily and if you

526

00:25:49,869 --> 00:25:49,159

don't manage the underbrush in the

527

00:25:51,730 --> 00:25:49,879

forest

528

00:25:55,330 --> 00:25:51,740

you're gonna build up tremendous amounts

529

00:25:58,029 --> 00:25:55,340

of fuel that I looked at live footage of

530

00:26:00,490 --> 00:25:58,039

the Paradise fire a couple years ago

531

00:26:03,700 --> 00:26:00,500

where somebody actually drove through it

532

00:26:06,850 --> 00:26:03,710

and the amount of what's called litter

533

00:26:10,810 --> 00:26:06,860

on the forest floor was mind-boggling

534

00:26:13,899 --> 00:26:10,820

that was an explosion waiting to happen

535

00:26:15,999 --> 00:26:13,909

I understand that some cooler heads out

536

00:26:17,649 --> 00:26:16,009

in California are now realizing that we

537

00:26:21,190 --> 00:26:17,659

really ought to be managing that forest

538

00:26:24,279 --> 00:26:21,200

a little better and that would go a long

539

00:26:27,159 --> 00:26:24,289

way towards solving this issue but

540

00:26:29,769 --> 00:26:27,169

California is the home of wildfires at

541

00:26:32,379 --> 00:26:29,779

the end of summer it's dry and the more

542

00:26:34,570 --> 00:26:32,389

vegetation there is to burn the more

543

00:26:36,720 --> 00:26:34,580

it's gonna burn well and you made a

544

00:26:39,549 --> 00:26:36,730

point I think at a love-in show that

545

00:26:41,499 --> 00:26:39,559

when you look at the cost of these

546

00:26:43,200 --> 00:26:41,509

things of course the cost is going to be

547

00:26:45,630 --> 00:26:43,210

higher because there's more

548

00:26:47,220 --> 00:26:45,640

damage that can be done and the value of

549

00:26:49,230 --> 00:26:47,230

everything is much higher when you have

550

00:26:50,730 --> 00:26:49,240

wildfires in California where real

551

00:26:53,210 --> 00:26:50,740

estate is so expensive of course it's

552

00:26:55,500 --> 00:26:53,220

gonna be very costly yeah well you know

553

00:26:57,360 --> 00:26:55,510

the fact that matter is when you look at

554

00:26:59,789 --> 00:26:57,370

weather-related damages you've got it

555

00:27:02,549 --> 00:26:59,799

exactly right we have more stuff and

556

00:27:05,700 --> 00:27:02,559

more people and higher property values

557

00:27:08,580 --> 00:27:05,710

in the way of the weather a guy who

558

00:27:11,539 --> 00:27:08,590

studies this is Roger Pelkey jr. out of

559

00:27:15,060 --> 00:27:11,549

University of Colorado and he uses

560

00:27:17,610 --> 00:27:15,070

insurance industry data which if

561

00:27:21,649 --> 00:27:17,620

anything would be biased towards more

562

00:27:26,070 --> 00:27:21,659

damages so they can charge more and

563

00:27:31,680 --> 00:27:26,080

takes a look at global the percent of

564

00:27:34,700 --> 00:27:31,690

global GDP that is damaged by weather

565

00:27:38,610 --> 00:27:34,710

and climate issues from year to year and

566

00:27:40,350 --> 00:27:38,620

there's a slight negative trend in it in

567

00:27:43,889 --> 00:27:40,360

other words after you allow for the fact

568

00:27:45,990 --> 00:27:43,899

that yeah we have more stuff in the way

569

00:27:49,620 --> 00:27:46,000

of the weather and we have more people

570

00:27:52,740 --> 00:27:49,630

with more stuff then and then that is

571

00:27:56,070 --> 00:27:52,750

reflected in GDP that as a percentage of

572

00:27:57,740 --> 00:27:56,080

global GDP weather-related damages are

573

00:28:00,980 --> 00:27:57,750

going down not up

574

00:28:02,970 --> 00:28:00,990

yes it's just like the hurricane issue

575

00:28:04,980 --> 00:28:02,980

yeah I think it's interesting how the

576

00:28:08,279 --> 00:28:04,990

activists every time there's some

577

00:28:14,820 --> 00:28:08,289

extreme weather that's got to be climate

578

00:28:19,500 --> 00:28:14,830

change and yeah in doing that they're

579

00:28:23,090 --> 00:28:19,510

poisoning science because as Karl Popper

580

00:28:27,060 --> 00:28:23,100

we've already mentioned in this talk

581

00:28:28,529 --> 00:28:27,070

wrote repeatedly if you have a

582

00:28:31,860 --> 00:28:28,539

scientific theory that explains

583

00:28:36,000 --> 00:28:31,870

everything it's not science because it

584

00:28:39,659 --> 00:28:36,010

can't be tested and there's two favorite

585

00:28:40,289 --> 00:28:39,669

examples of what he called pseudoscience

586

00:28:43,889 --> 00:28:40,299

things

587

00:28:45,450 --> 00:28:43,899

claimed to be scientific but in fact art

588

00:28:51,060 --> 00:28:45,460

because they explain everything

589

00:28:55,500 --> 00:28:51,070

our Marxism and psychoanalysis so yeah

590

00:28:57,110 --> 00:28:55,510

when we attribute every weather event to

591

00:28:59,490 --> 00:28:57,120

global warming and countless

592

00:29:02,760 --> 00:28:59,500

convoluted explanation which is always

593

00:29:04,320 --> 00:29:02,770

post hoc reasoning by the way oh yeah we

594

00:29:07,230 --> 00:29:04,330

can see now how this happened from

595

00:29:09,180 --> 00:29:07,240

global warming you're not doing science

596

00:29:10,800 --> 00:29:09,190

anymore you're doing go and I I used to

597

00:29:12,420 --> 00:29:10,810

have fun with it and say that oh when

598

00:29:14,340 --> 00:29:12,430

it's really cold a really cold day in

599

00:29:17,610 --> 00:29:14,350

the winter up guess there's no global

600

00:29:18,620 --> 00:29:17,620

warming look look how cold it is but you

601
00:29:22,170 --> 00:29:18,630
can't do that either

602
00:29:24,120 --> 00:29:22,180
but now but now they've more from global

603
00:29:26,130 --> 00:29:24,130
warming to climate change what is your

604
00:29:27,900 --> 00:29:26,140
understanding about how that shift

605
00:29:31,410 --> 00:29:27,910
happened from calling it global warming

606
00:29:35,460 --> 00:29:31,420
to calling it climate change well this

607
00:29:38,790 --> 00:29:35,470
is only anecdotal I would guess that

608
00:29:40,380 --> 00:29:38,800
because it wasn't really warming at a

609
00:29:43,880 --> 00:29:40,390
rate that appeared to be pretty

610
00:29:47,940 --> 00:29:43,890
substantial we'll have to say that well

611
00:29:51,270 --> 00:29:47,950
you know warming will cause other

612
00:29:53,700 --> 00:29:51,280
climate effects okay so we think it

613
00:29:58,230 --> 00:29:53,710

would and so we'll call it climate

614

00:29:59,970 --> 00:29:58,240

change now unfortunately you know take a

615

00:30:01,560 --> 00:29:59,980

look at all kinds of fields of data that

616

00:30:06,330 --> 00:30:01,570

you might be interested in take a look

617

00:30:09,480 --> 00:30:06,340

at global precipitation rainfall you

618

00:30:12,630 --> 00:30:09,490

don't see very much anywhere you do see

619

00:30:15,900 --> 00:30:12,640

some areas that are getting drier the

620

00:30:17,370 --> 00:30:15,910

Pacific Southwest being one of them and

621

00:30:21,210 --> 00:30:17,380

you see some areas that are getting

622

00:30:23,370 --> 00:30:21,220

wetter the United States northeast is

623

00:30:26,190 --> 00:30:23,380

one of those but averaged across the

624

00:30:29,550 --> 00:30:26,200

planet we don't see any real consistent

625

00:30:33,300 --> 00:30:29,560

trends so climate change is something

626
00:30:37,230 --> 00:30:33,310
used to catch everything becomes known

627
00:30:39,000 --> 00:30:37,240
one thing though it's really a bait and

628
00:30:40,950 --> 00:30:39,010
switch to switch from global warming to

629
00:30:42,930 --> 00:30:40,960
climate change because global warming

630
00:30:45,600 --> 00:30:42,940
warming of the lower layer of the

631
00:30:47,400 --> 00:30:45,610
atmosphere is what drives all these

632
00:30:49,710 --> 00:30:47,410
perspective changes changes in climate

633
00:30:51,600 --> 00:30:49,720
so you really should be just just

634
00:30:53,970 --> 00:30:51,610
looking at the warming variable it's the

635
00:30:56,850 --> 00:30:53,980
critical one by the way it appears to me

636
00:31:01,230 --> 00:30:56,860
the new term is climate crisis

637
00:31:03,600 --> 00:31:01,240
CNN uses that very routinely as if it's

638
00:31:05,460 --> 00:31:03,610

not pejorative at all they call it they

639

00:31:07,380 --> 00:31:05,470

ask they're asking about what what's the

640

00:31:09,420 --> 00:31:07,390

effect that the climate crisis is having

641

00:31:11,010 --> 00:31:09,430

on our hurricanes Wow

642

00:31:14,670 --> 00:31:11,020

[Music]

643

00:31:18,720 --> 00:31:14,680

I have another illustration here which

644

00:31:20,280 --> 00:31:18,730

I'm probably gonna get you the the whole

645

00:31:22,340 --> 00:31:20,290

thing that all hurricanes are slowing

646

00:31:25,740 --> 00:31:22,350

down and they're producing more rainfall

647

00:31:29,520 --> 00:31:25,750

if you bet I have the main illustration

648

00:31:32,760 --> 00:31:29,530

from that paper and it's very clear that

649

00:31:34,050 --> 00:31:32,770

there are two sets of data I'm looking

650

00:31:41,160 --> 00:31:34,060

at it that's why I'm gonna give it at

651
00:31:44,090 --> 00:31:41,170
Sinai and say from 1980 this is the

652
00:31:46,770 --> 00:31:44,100
chart you're eventually gonna see from

653
00:31:51,570 --> 00:31:46,780
1982 now which is the end of the chart

654
00:31:54,120 --> 00:31:51,580
there's no change at all there was a

655
00:31:57,000 --> 00:31:54,130
period in the 1970s where there were

656
00:31:59,340 --> 00:31:57,010
zero hurricanes installed nobody knows

657
00:32:03,540 --> 00:31:59,350
why that happened and then after they

658
00:32:06,330 --> 00:32:03,550
went back to their normal stall rate it

659
00:32:09,480 --> 00:32:06,340
stayed the same what about the fact that

660
00:32:12,510 --> 00:32:09,490
we're looking at such a short blip of a

661
00:32:15,050 --> 00:32:12,520
period of time and that if you were

662
00:32:18,750 --> 00:32:15,060
flipping a coin ten thousand times

663
00:32:22,530 --> 00:32:18,760

you're gonna get runs of twenty heads in

664

00:32:24,630 --> 00:32:22,540

a row is there any thing to that analogy

665

00:32:26,270 --> 00:32:24,640

when we look at what this may be and

666

00:32:29,790 --> 00:32:26,280

whether this might just be randomness

667

00:32:31,350 --> 00:32:29,800

again twenty heads and rows you have to

668

00:32:33,270 --> 00:32:31,360

flip it many more than ten thousand

669

00:32:35,220 --> 00:32:33,280

times to get a 50 percent probability of

670

00:32:37,140 --> 00:32:35,230

that you know wow you're an extra

671

00:32:39,990 --> 00:32:37,150

statistician I'm impressed you can look

672

00:32:46,170 --> 00:32:40,000

that up when I'm playing a probability

673

00:32:51,240 --> 00:32:46,180

chart but yes I didn't know is the

674

00:32:53,190 --> 00:32:51,250

answer to your question is the rate of

675

00:32:58,080 --> 00:32:53,200

carbon dioxide addition to the

676
00:33:01,410 --> 00:32:58,090
atmosphere and say since World War two

677
00:33:07,830 --> 00:33:01,420
is that pretty unprecedented yeah

678
00:33:12,570 --> 00:33:07,840
probably is but so what's it

679
00:33:14,220 --> 00:33:12,580
so is teen pregnancy yeah that you could

680
00:33:15,540 --> 00:33:14,230
line up statistics with each other and

681
00:33:17,100 --> 00:33:15,550
say that went up and this went up at the

682
00:33:18,270 --> 00:33:17,110
same time but doesn't one cause the

683
00:33:20,090 --> 00:33:18,280
other right why don't we why don't we

684
00:33:25,440 --> 00:33:20,100
talk about

685
00:33:29,100 --> 00:33:25,450
the whole the real scary thing the real

686
00:33:32,610 --> 00:33:29,110
scary thing in global warming is that

687
00:33:34,650 --> 00:33:32,620
Greenland which is huge contains 11

688
00:33:37,440 --> 00:33:34,660

percent of the world's freshwater locked

689

00:33:41,100 --> 00:33:37,450

up in its ice and Greenland suddenly

690

00:33:44,850 --> 00:33:41,110

sheds its ice and if it did that there

691

00:33:49,290 --> 00:33:44,860

are be 23 feet of sea level rise fairly

692

00:33:51,930 --> 00:33:49,300

quickly that'd be a lot fortunately we

693

00:33:55,440 --> 00:33:51,940

now have studies that have gone back

694

00:33:57,750 --> 00:33:55,450

into eras where it was quite a bit

695

00:34:01,230 --> 00:33:57,760

warmer in Greenland and for a longer

696

00:34:03,900 --> 00:34:01,240

period of time then we can do it by

697

00:34:06,660 --> 00:34:03,910

burning fossil fuels and Greenland held

698

00:34:10,230 --> 00:34:06,670

the vast majority of its ice it didn't

699

00:34:13,290 --> 00:34:10,240

fall off at the beginning of not the

700

00:34:18,180 --> 00:34:13,300

current interglacial but the last

701
00:34:22,830 --> 00:34:18,190
interglacial so about 180 118 thousand

702
00:34:24,870 --> 00:34:22,840
years ago a danish team dug a core

703
00:34:26,490 --> 00:34:24,880
through the ice and you can see from

704
00:34:28,410 --> 00:34:26,500
looking at the chemistry in the various

705
00:34:33,420 --> 00:34:28,420
years you can see what the temperature

706
00:34:37,710 --> 00:34:33,430
was and it was about 6 to 8 degrees

707
00:34:40,800 --> 00:34:37,720
celsius average warmer than the 20th

708
00:34:46,800 --> 00:34:40,810
century for the summers for 6,000 years

709
00:34:50,040 --> 00:34:46,810
because the earth orbital variations at

710
00:34:53,430 --> 00:34:50,050
the beginning of and off a nice aged his

711
00:34:55,590 --> 00:34:53,440
son and lined up with the seasonal tilt

712
00:34:58,140 --> 00:34:55,600
in a way that created a very large

713
00:35:00,750 --> 00:34:58,150

warming of the northern hemisphere and

714

00:35:04,170 --> 00:35:00,760

it was warmer than fact in the beginning

715

00:35:07,020 --> 00:35:04,180

of the current interglacial there has to

716

00:35:09,450 --> 00:35:07,030

be some kind of a real disturbance to

717

00:35:12,510 --> 00:35:09,460

end an ice age you know if you think

718

00:35:15,060 --> 00:35:12,520

about it get an ice age in your mind

719

00:35:18,060 --> 00:35:15,070

pretty easily you just get it cold

720

00:35:20,190 --> 00:35:18,070

enough that snow sticks around doesn't

721

00:35:24,960 --> 00:35:20,200

melt and then more and more and more

722

00:35:27,000 --> 00:35:24,970

solar radiation is not absorbed well and

723

00:35:29,190 --> 00:35:27,010

there's also another warming period that

724

00:35:32,370 --> 00:35:29,200

you referred to on on Levin I believe

725

00:35:34,829 --> 00:35:32,380

you said it was a late 18-hundreds

726

00:35:37,529 --> 00:35:34,839

and what what that obviously wasn't

727

00:35:39,870 --> 00:35:37,539

caused by car carbon emissions it's the

728

00:35:45,410 --> 00:35:39,880

early 1900's early nineteen hundred's so

729

00:35:49,170 --> 00:35:45,420

what caused that I don't know it warmed

730

00:35:53,670 --> 00:35:49,180

beginning around 1910 if we trust the

731

00:35:57,210 --> 00:35:53,680

surface temperatures it warmed between

732

00:36:01,279 --> 00:35:57,220

the 1910 to 1945 at the same rate that

733

00:36:05,309 --> 00:36:01,289

it warmed in the late 20th century and

734

00:36:07,559 --> 00:36:05,319

again the early 21st is debatable but

735

00:36:12,839 --> 00:36:07,569

less let's just accept the records that

736

00:36:16,469 --> 00:36:12,849

we have so what caused such a warming in

737

00:36:19,890 --> 00:36:16,479

the early 20th century it's not carbon

738

00:36:22,650 --> 00:36:19,900

dioxide we had the background carbon

739

00:36:24,690 --> 00:36:22,660

dioxide is 280 parts per million and

740

00:36:27,120 --> 00:36:24,700

when that second first warming started

741

00:36:30,989 --> 00:36:27,130

in the 20th century it was only eighteen

742

00:36:34,229 --> 00:36:30,999

parts per million higher now it's 125

743

00:36:36,599 --> 00:36:34,239

parts per million higher than the in the

744

00:36:39,120 --> 00:36:36,609

background concentration if you got four

745

00:36:41,039 --> 00:36:39,130

tenths of a degree C of warming which is

746

00:36:44,640 --> 00:36:41,049

what happened in the early 20th century

747

00:36:47,160 --> 00:36:44,650

or eighteen parts per million of co2 and

748

00:36:48,930 --> 00:36:47,170

it would be so hot now we wouldn't be

749

00:36:50,279 --> 00:36:48,940

having this discussion because that

750

00:36:52,349 --> 00:36:50,289

would mean the sensitivity of

751
00:36:56,279 --> 00:36:52,359
temperature carbon dioxide would have to

752
00:36:59,759 --> 00:36:56,289
be outrageously high so nobody knows I

753
00:37:02,900 --> 00:36:59,769
think what caused that but and here's

754
00:37:06,209 --> 00:37:02,910
the here's the big button

755
00:37:08,969 --> 00:37:06,219
this came out in science magazine right

756
00:37:13,190 --> 00:37:08,979
before the 2016 election we can discuss

757
00:37:16,249 --> 00:37:13,200
why that happens a little little later

758
00:37:19,589 --> 00:37:16,259
all those computer models are tuned

759
00:37:22,469 --> 00:37:19,599
their parameters are fiddled with to

760
00:37:26,039 --> 00:37:22,479
make them match the climate of the 20th

761
00:37:27,930 --> 00:37:26,049
century so the models are tuned to say

762
00:37:29,579 --> 00:37:27,940
that the warming of the early 20th

763
00:37:33,739 --> 00:37:29,589

century was in fact caused by human

764

00:37:37,170 --> 00:37:33,749

activity that's that's an absurdity and

765

00:37:39,380 --> 00:37:37,180

then they tune get the late 20th century

766

00:37:41,700 --> 00:37:39,390

warming so when you match up the

767

00:37:44,370 --> 00:37:41,710

computer models versus the surface

768

00:37:45,900 --> 00:37:44,380

temperature hey looks pretty good

769

00:37:48,390 --> 00:37:45,910

because they are tuned to do

770

00:37:50,730 --> 00:37:48,400

but when you get off the surface which

771

00:37:52,980 --> 00:37:50,740

is what John Christie does it is

772

00:37:55,160 --> 00:37:52,990

congressional testimony you can see that

773

00:37:57,450 --> 00:37:55,170

they have a wildly divergent and

774

00:38:01,740 --> 00:37:57,460

probably the price of tuning those

775

00:38:04,500 --> 00:38:01,750

models was complete screw-up

776

00:38:08,910 --> 00:38:04,510

the tropical atmosphere that we talked

777

00:38:12,860 --> 00:38:08,920

about earlier in this program so what

778

00:38:15,750 --> 00:38:12,870

happened was how this all came out is

779

00:38:19,290 --> 00:38:15,760

every time the United Nations produces a

780

00:38:21,900 --> 00:38:19,300

climate report they get a collection of

781

00:38:24,780 --> 00:38:21,910

global climate models that are collated

782

00:38:26,490 --> 00:38:24,790

by the US Department of Energy and so

783

00:38:28,350 --> 00:38:26,500

for the last report which came out in

784

00:38:30,390 --> 00:38:28,360

2013

785

00:38:33,360 --> 00:38:30,400

and there's a new one coming out soon by

786

00:38:37,800 --> 00:38:33,370

the way but for the last report people

787

00:38:39,150 --> 00:38:37,810

had to send in their models to do e they

788

00:38:40,950 --> 00:38:39,160

had to send in what's called a frozen

789

00:38:43,230 --> 00:38:40,960

code model this is the model that we're

790

00:38:44,730 --> 00:38:43,240

going to use this is the model that you

791

00:38:47,660 --> 00:38:44,740

can use to compare to all the other

792

00:38:51,630 --> 00:38:47,670

models and one of the modeling groups

793

00:38:53,160 --> 00:38:51,640

like Max Planck Institute or is about to

794

00:38:56,220 --> 00:38:53,170

send their model in but their chief

795

00:38:58,710 --> 00:38:56,230

modeler Ernst rettner was unavailable to

796

00:39:03,420 --> 00:38:58,720

work on I don't know why and so what's

797

00:39:06,750 --> 00:39:03,430

left two of the lesser lights to put the

798

00:39:10,740 --> 00:39:06,760

frozen code model together and they got

799

00:39:13,260 --> 00:39:10,750

it to work and warming in it was over

800

00:39:15,780 --> 00:39:13,270

seven degrees Celsius which was way out

801
00:39:18,570 --> 00:39:15,790
of line compared to the other models and

802
00:39:20,790 --> 00:39:18,580
so it was quoted in the science magazine

803
00:39:24,180 --> 00:39:20,800
article we had to get that warming down

804
00:39:29,280 --> 00:39:24,190
and so the play with different variables

805
00:39:32,700 --> 00:39:29,290
to get it down down and down so this

806
00:39:34,650 --> 00:39:32,710
caused quite a stir because as indicated

807
00:39:41,700 --> 00:39:34,660
in the science magazine article by Paul

808
00:39:44,310 --> 00:39:41,710
Busan in late October of 2016 they

809
00:39:48,600 --> 00:39:44,320
didn't want this tuning to come out

810
00:39:51,660 --> 00:39:48,610
because people who might be skeptical

811
00:39:52,920 --> 00:39:51,670
and you should be skeptical I think if

812
00:39:55,260 --> 00:39:52,930
you're not skeptical you're not

813
00:39:57,150 --> 00:39:55,270

scientifically healthy but people who

814

00:39:59,460 --> 00:39:57,160

might be skeptical will seize upon the

815

00:40:01,950 --> 00:39:59,470

tuning of the models

816

00:40:06,480 --> 00:40:01,960

an excuse to not really believe them

817

00:40:08,730 --> 00:40:06,490

very much and he was of course right so

818

00:40:11,609 --> 00:40:08,740

then a paper came out by a guy by the

819

00:40:13,710 --> 00:40:11,619

name of Frederick Hardin who was the

820

00:40:15,599 --> 00:40:13,720

head model it for the French and was

821

00:40:20,099 --> 00:40:15,609

called the art and science of climate

822

00:40:22,650 --> 00:40:20,109

model tuning it was the Judy curry you

823

00:40:26,970 --> 00:40:22,660

ought to look up judith curry calm she's

824

00:40:30,540 --> 00:40:26,980

probably the most blogged scientist on

825

00:40:32,550 --> 00:40:30,550

global climate change she wrote in her

826

00:40:34,770 --> 00:40:32,560

blog that if you're gonna read one

827

00:40:39,930 --> 00:40:34,780

climate modeling paper in your life read

828

00:40:42,570 --> 00:40:39,940

that paper by or Dan or tanta how you

829

00:40:45,270 --> 00:40:42,580

might take a parameter and fiddle with

830

00:40:48,390 --> 00:40:45,280

it to produce the quote there at least

831

00:40:53,250 --> 00:40:48,400

are his words the anticipated acceptable

832

00:40:54,870 --> 00:40:53,260

range of change so whoa wait a minute so

833

00:40:59,520 --> 00:40:54,880

we have this box it's got all these

834

00:41:02,970 --> 00:40:59,530

knobs on it that we can turn to tune to

835

00:41:04,650 --> 00:41:02,980

get a certain output and we tuned it to

836

00:41:09,510 --> 00:41:04,660

give an answer that we think is he

837

00:41:10,680 --> 00:41:09,520

anticipated acceptable answer that's not

838

00:41:13,170 --> 00:41:10,690

science anymore boss

839

00:41:16,800 --> 00:41:13,180

that's mathematical philosophy and

840

00:41:19,349 --> 00:41:16,810

they're all tuned every last one of them

841

00:41:22,589 --> 00:41:19,359

turns out to be tuned including the

842

00:41:26,460 --> 00:41:22,599

Russians I presume the Russian models

843

00:41:29,910 --> 00:41:26,470

too so here's the thing

844

00:41:31,770 --> 00:41:29,920

why did this happen why would the

845

00:41:33,270 --> 00:41:31,780

climate modeling community all the

846

00:41:36,630 --> 00:41:33,280

sudden come out say okay we're gonna

847

00:41:39,920 --> 00:41:36,640

fess up we're tuning our models and we

848

00:41:42,630 --> 00:41:39,930

really really don't like to do this so

849

00:41:46,140 --> 00:41:42,640

we don't want we want these models to be

850

00:41:49,620 --> 00:41:46,150

freer and cleaner so you know give us

851

00:41:53,490 --> 00:41:49,630

more money to clean this up give us a

852

00:41:55,589 --> 00:41:53,500

lot more money to clean this up that

853

00:41:59,190 --> 00:41:55,599

paper all that stuff came out in late

854

00:42:00,740 --> 00:41:59,200

October of 2016 the original paper the

855

00:42:07,440 --> 00:42:00,750

[h__h] damp paper was probably written

856

00:42:12,170 --> 00:42:07,450

somewhere in 1915 maybe mid 1915 or

857

00:42:15,799 --> 00:42:12,180

something the paper was finally accepted

858

00:42:18,109 --> 00:42:15,809

in actually March of 17 but everybody

859

00:42:21,970 --> 00:42:18,119

had copies of it why did they want this

860

00:42:23,930 --> 00:42:21,980

out because there is no chance that

861

00:42:26,299 --> 00:42:23,940

Hillary Clinton's not going to be

862

00:42:28,970 --> 00:42:26,309

elected president she's more of a hawk

863

00:42:34,880 --> 00:42:28,980

on climate change than Obama was and if

864

00:42:36,799 --> 00:42:34,890

us modelers go and say this president we

865

00:42:39,440 --> 00:42:36,809

really need help with our mom both said

866

00:42:41,089 --> 00:42:39,450

we actually aren't behaving as well as

867

00:42:44,809 --> 00:42:41,099

they should we need really reliable

868

00:42:46,519 --> 00:42:44,819

predictions they'll get tons of my god

869

00:42:49,849 --> 00:42:46,529

can you imagine what was like on the

870

00:42:53,260 --> 00:42:49,859

morning of November 9th this community

871

00:42:56,960 --> 00:42:53,270

all of a sudden what oh how can this be

872

00:42:59,480 --> 00:42:56,970

because the reason I really believe that

873

00:43:01,609 --> 00:42:59,490

they put that out was to built the

874

00:43:02,120 --> 00:43:01,619

government and that means you and me for

875

00:43:03,980 --> 00:43:02,130

more money

876

00:43:06,470 --> 00:43:03,990

interesting they thought for sure of the

877

00:43:09,680 --> 00:43:06,480

be sure thing let me ask you one more

878

00:43:12,380 --> 00:43:09,690

time than oh one one more time than have

879

00:43:14,390 --> 00:43:12,390

logic one more time well we need more

880

00:43:17,230 --> 00:43:14,400

logic on this issue what one more

881

00:43:20,089 --> 00:43:17,240

question about that early warming in

882

00:43:23,680 --> 00:43:20,099

1900s yes we really don't know what

883

00:43:26,029 --> 00:43:23,690

caused that I don't think we do okay but

884

00:43:29,180 --> 00:43:26,039

theoretically unless it was a flip of a

885

00:43:31,519 --> 00:43:29,190

coin situation something caused it could

886

00:43:33,289 --> 00:43:31,529

it be that whatever caused that which we

887

00:43:38,839 --> 00:43:33,299

don't know what it is is what's causing

888

00:43:41,589 --> 00:43:38,849

it now probably not because of the

889

00:43:45,349 --> 00:43:41,599

concurrency of stratospheric cooling

890

00:43:49,099 --> 00:43:45,359

with the lower atmosphere and and

891

00:43:50,960 --> 00:43:49,109

surface warming we don't have a lot of

892

00:43:55,970 --> 00:43:50,970

evidence from the stratosphere obviously

893

00:43:58,430 --> 00:43:55,980

during the early 20th century but you

894

00:44:00,920 --> 00:43:58,440

know if I were gonna pick a culprit for

895

00:44:05,240 --> 00:44:00,930

that I'd say probably some interaction

896

00:44:07,039 --> 00:44:05,250

of Sun with other systems but I don't

897

00:44:11,180 --> 00:44:07,049

know I don't think anybody really

898

00:44:12,710 --> 00:44:11,190

yes but tuning models to say ah that's

899

00:44:15,740 --> 00:44:12,720

all caused by human beings in fact the

900

00:44:19,940 --> 00:44:15,750

latest mantra that were seen from NASA

901
00:44:21,470 --> 00:44:19,950
is that all climate changed all climate

902
00:44:25,540 --> 00:44:21,480
changed since the Industrial Revolution

903
00:44:29,350 --> 00:44:25,550
is caused by human beings that means

904
00:44:32,340 --> 00:44:29,360
to make that assertion is to imply that

905
00:44:36,210 --> 00:44:32,350
you have a perfect model which you don't

906
00:44:38,470 --> 00:44:36,220
and that there is no noise in the data

907
00:44:39,940 --> 00:44:38,480
you know that that four tenths of a

908
00:44:42,940 --> 00:44:39,950
degree in your twentieth century to me

909
00:44:46,360 --> 00:44:42,950
that's the scientific literature you

910
00:44:47,880 --> 00:44:46,370
used to say that's a sign of what the

911
00:44:50,860 --> 00:44:47,890
natural noise and the climate is

912
00:44:51,910 --> 00:44:50,870
alarming in there so it's really it

913
00:44:53,860 --> 00:44:51,920

should be really interesting to people

914

00:44:55,780 --> 00:44:53,870

that you know you you are buying into

915

00:44:58,180 --> 00:44:55,790

the fact that there has been some

916

00:45:00,070 --> 00:44:58,190

warming and that it has been caused by

917

00:45:03,520 --> 00:45:00,080

humans but you're saying that it's not

918

00:45:05,110 --> 00:45:03,530

clear exactly how much of that how much

919

00:45:10,660 --> 00:45:05,120

warming that truly has been as a result

920

00:45:13,300 --> 00:45:10,670

of humans and and and not necessarily to

921

00:45:16,030 --> 00:45:13,310

a dangerous extent and I would like you

922

00:45:21,370 --> 00:45:16,040

to address what may be some of the

923

00:45:24,640 --> 00:45:21,380

positive benefits to the globe of a bit

924

00:45:26,680 --> 00:45:24,650

of a one degree Celsius warming because

925

00:45:28,870 --> 00:45:26,690

everybody points to all the negatives

926
00:45:30,690 --> 00:45:28,880
but certainly if there's so many

927
00:45:33,610 --> 00:45:30,700
negatives there has to be some positives

928
00:45:35,290 --> 00:45:33,620
well yeah as the surface temperature

929
00:45:38,410 --> 00:45:35,300
went up one degree if we believe that

930
00:45:41,770 --> 00:45:38,420
data in the industrialized world life

931
00:45:44,530 --> 00:45:41,780
expectancy doubled and per capita wealth

932
00:45:52,210 --> 00:45:44,540
say in the United States went up eleven

933
00:45:54,850 --> 00:45:52,220
fold one thing that we know is co2 is a

934
00:45:56,260 --> 00:45:54,860
natural fertilizer for plants just think

935
00:45:59,860 --> 00:45:56,270
of the old high school equation of

936
00:46:03,810 --> 00:45:59,870
photosynthesis co2 plus h2o yields the

937
00:46:07,530 --> 00:46:03,820
h2o water plus carbon dioxide yields

938
00:46:09,340 --> 00:46:07,540

carbohydrates that's a vast

939

00:46:11,260 --> 00:46:09,350

simplification to the process of

940

00:46:14,250 --> 00:46:11,270

photosynthesis which is much more

941

00:46:16,990 --> 00:46:14,260

complicated but if you put more water in

942

00:46:19,150 --> 00:46:17,000

unless the place saturated you know your

943

00:46:22,720 --> 00:46:19,160

plants grow better you put more co2 in

944

00:46:25,900 --> 00:46:22,730

your plants grow better and we can show

945

00:46:28,350 --> 00:46:25,910

with satellite data we've now have since

946

00:46:31,990 --> 00:46:28,360

the late 1970s

947

00:46:35,110 --> 00:46:32,000

data on what's called the vegetation

948

00:46:39,250 --> 00:46:35,120

index which is a measure of how green

949

00:46:43,780 --> 00:46:39,260

the planet is a wonderful paper by a

950

00:46:46,020 --> 00:46:43,790

I think it is there's you 2016 paper and

951
00:46:48,460 --> 00:46:46,030
nature magazine showing the the the

952
00:46:53,650 --> 00:46:48,470
title of papers the greening of the

953
00:46:57,100 --> 00:46:53,660
earth and its drivers and it shows it's

954
00:47:00,070 --> 00:46:57,110
it's the entire globe shows the massive

955
00:47:02,770 --> 00:47:00,080
greening that's taking place over most

956
00:47:04,180 --> 00:47:02,780
of the planet there are some small areas

957
00:47:09,550 --> 00:47:04,190
of browning but they're not very much

958
00:47:12,130 --> 00:47:09,560
and the drivers they did what's called a

959
00:47:16,380 --> 00:47:12,140
factor analysis to determine what's

960
00:47:20,230 --> 00:47:16,390
causing this massive greenie about 80

961
00:47:22,030 --> 00:47:20,240
percent of it was caught simply by the

962
00:47:25,770 --> 00:47:22,040
direct fertilization effect of carbon

963
00:47:28,840 --> 00:47:25,780

dioxide five percent or so from airborne

964

00:47:31,750 --> 00:47:28,850

nitrates which are also a human

965

00:47:34,000 --> 00:47:31,760

contribution another small percent was

966

00:47:37,210 --> 00:47:34,010

from land use changes I don't know if

967

00:47:40,090 --> 00:47:37,220

you've been following the reforestation

968

00:47:42,300 --> 00:47:40,100

of eastern North America used to be kind

969

00:47:44,440 --> 00:47:42,310

of wide open parkland now it's a jungle

970

00:47:47,410 --> 00:47:44,450

once you get away from the city it's

971

00:47:48,430 --> 00:47:47,420

just huge amounts of vegetation but to

972

00:47:51,580 --> 00:47:48,440

make sure I got the number right because

973

00:47:54,430 --> 00:47:51,590

it cut out 80 percent of co2 with the

974

00:47:57,460 --> 00:47:54,440

increase in co2 and roughly 10 percent

975

00:48:00,190 --> 00:47:57,470

from other human activities so 90

976

00:48:04,360 --> 00:48:00,200

percent of the planetary greening is a

977

00:48:05,790 --> 00:48:04,370

result of our industrial activity so if

978

00:48:09,130 --> 00:48:05,800

it's good for the planet to be green

979

00:48:10,600 --> 00:48:09,140

then that's been a positive effect what

980

00:48:15,490 --> 00:48:10,610

are some of that other positive effects

981

00:48:18,880 --> 00:48:15,500

do you think of this slight warming well

982

00:48:20,440 --> 00:48:18,890

let's go back to the greening this this

983

00:48:23,440 --> 00:48:20,450

paper in nature magazine has wonderful

984

00:48:26,290 --> 00:48:23,450

maps showing where it's really draining

985

00:48:28,480 --> 00:48:26,300

up a heck of a lot where it's greening

986

00:48:32,590 --> 00:48:28,490

up average and through the whole

987

00:48:35,530 --> 00:48:32,600

spectrum and places on earth that have

988

00:48:41,710 --> 00:48:35,540

the greatest increase in their

989

00:48:43,960 --> 00:48:41,720

vegetation our wait for it the South

990

00:48:47,320 --> 00:48:43,970

American tropical rainforest the lungs

991

00:48:50,050 --> 00:48:47,330

of the world the African tropical

992

00:48:52,670 --> 00:48:50,060

rainforest the lungs of the world the

993

00:48:54,740 --> 00:48:52,680

East Asian tropical rainforest

994

00:48:57,380 --> 00:48:54,750

lungs of the world they're getting

995

00:49:00,859 --> 00:48:57,390

bigger not smaller they're getting more

996

00:49:03,980 --> 00:49:00,869

dense they're exchanging more carbon

997

00:49:05,930 --> 00:49:03,990

dioxide than they were before we put all

998

00:49:08,870 --> 00:49:05,940

that co2 in the air kind of

999

00:49:12,380 --> 00:49:08,880

mind-boggling isn't it based on modeling

1000

00:49:16,010 --> 00:49:12,390

that you would say you believe in how

1001
00:49:18,290 --> 00:49:16,020
many inches are we talking about the

1002
00:49:20,030 --> 00:49:18,300
ocean rising over what period of time no

1003
00:49:23,720 --> 00:49:20,040
I would think that that you're probably

1004
00:49:26,690 --> 00:49:23,730
looking at a foot and a half in the 21st

1005
00:49:30,109 --> 00:49:26,700
century so by the end of this century in

1006
00:49:32,540 --> 00:49:30,119
in 80 years the oceans will have risen a

1007
00:49:34,430 --> 00:49:32,550
foot ahead River well though the liver

1008
00:49:37,730 --> 00:49:34,440
isn't 2 feet 2 feet because we have

1009
00:49:42,160 --> 00:49:37,740
about seven inches of sea-level rise

1010
00:49:45,170 --> 00:49:42,170
since 1900 what's interesting by the way

1011
00:49:49,880 --> 00:49:45,180
we have two ways of measuring sea level

1012
00:49:53,870 --> 00:49:49,890
rise one is with tide gauges that are in

1013
00:49:56,839 --> 00:49:53,880

ports around the planet and the other

1014

00:50:00,309 --> 00:49:56,849

one which is in satellites the tide

1015

00:50:02,900 --> 00:50:00,319

gauge gaiter tide gauge data

1016

00:50:05,900 --> 00:50:02,910

don't show any increase in the rate of

1017

00:50:10,970 --> 00:50:05,910

sea level rise at all

1018

00:50:13,059 --> 00:50:10,980

the satellite data do but there are lots

1019

00:50:16,120 --> 00:50:13,069

of questions whether the satellite data

1020

00:50:19,099 --> 00:50:16,130

it was really high enough resolution to

1021

00:50:22,190 --> 00:50:19,109

pick up these small changes in sea level

1022

00:50:23,660 --> 00:50:22,200

I mean a tie gate is a real thing it

1023

00:50:26,450 --> 00:50:23,670

suffers from the problems of the land

1024

00:50:28,880 --> 00:50:26,460

itself maybe going up or down but you

1025

00:50:30,260 --> 00:50:28,890

can usually adjust for that and you know

1026

00:50:31,039 --> 00:50:30,270

if you look at global records you don't

1027

00:50:36,190 --> 00:50:31,049

see anything that's particularly

1028

00:50:38,660 --> 00:50:36,200

alarming so from the point we are today

1029

00:50:40,339 --> 00:50:38,670

till the end of the century that would

1030

00:50:43,339 --> 00:50:40,349

be an additional one and a half feet is

1031

00:50:46,130 --> 00:50:43,349

what you would seven inches so far

1032

00:50:48,410 --> 00:50:46,140

another foot and a half to go to help us

1033

00:50:51,710 --> 00:50:48,420

understand that if we were laying on

1034

00:50:54,589 --> 00:50:51,720

Miami Beach and the oceans were a foot

1035

00:50:57,260 --> 00:50:54,599

and a half higher with that Beach still

1036

00:51:01,460 --> 00:50:57,270

exists no wood it would definitely be

1037

00:51:02,329 --> 00:51:01,470

eroded some but for much I can't tell

1038

00:51:05,410 --> 00:51:02,339

you for sure if they don't know the

1039

00:51:12,130 --> 00:51:05,420

exact pitch of the beach but

1040

00:51:16,030 --> 00:51:12,140

if you have a storm a storm surge when

1041

00:51:18,730 --> 00:51:16,040

the ocean is one and a half feet or two

1042

00:51:20,590 --> 00:51:18,740

feet higher than it was that storm surge

1043

00:51:23,980 --> 00:51:20,600

is gonna get driven inland quite a bit

1044

00:51:27,820 --> 00:51:23,990

further so you will get more damage from

1045

00:51:30,280 --> 00:51:27,830

that but again having said all this both

1046

00:51:33,280 --> 00:51:30,290

in the United States data and in global

1047

00:51:39,760 --> 00:51:33,290

data weather-related damages as a

1048

00:51:41,200 --> 00:51:39,770

function of GDP are not going up and no

1049

00:51:43,000 --> 00:51:41,210

but I do think it'd be significant if

1050

00:51:44,410 --> 00:51:43,010

people felt that Miami Beach was no

1051
00:51:46,780 --> 00:51:44,420
longer gonna exist

1052
00:51:47,890 --> 00:51:46,790
well not an adjust and the longer exists

1053
00:51:53,490 --> 00:51:47,900
that's the point

1054
00:51:55,930 --> 00:51:53,500
the people will adapt they will probably

1055
00:52:01,000 --> 00:51:55,940
well let's put it this way do you think

1056
00:52:03,520 --> 00:52:01,010
it's a great idea that from Maine all

1057
00:52:09,550 --> 00:52:03,530
the way around Florida to the Texas Gulf

1058
00:52:11,860 --> 00:52:09,560
Coast it is all beach houses and every

1059
00:52:15,910 --> 00:52:11,870
one of those beaches is subject to

1060
00:52:17,740 --> 00:52:15,920
hurricanes and so what happens when the

1061
00:52:21,400 --> 00:52:17,750
storm surge from the hurricane comes and

1062
00:52:23,220 --> 00:52:21,410
knocks down your beach house who built

1063
00:52:26,740 --> 00:52:23,230

back up who pays for it

1064

00:52:29,470 --> 00:52:26,750

well you as homeowner have highly

1065

00:52:33,700 --> 00:52:29,480

subsidized flood insurance highly

1066

00:52:35,770 --> 00:52:33,710

subsidized by whom you and me who don't

1067

00:52:38,830 --> 00:52:35,780

have the beach house and so you can

1068

00:52:40,960 --> 00:52:38,840

might as well say hurricane you you take

1069

00:52:44,020 --> 00:52:40,970

all the money that you earn you stick it

1070

00:52:47,560 --> 00:52:44,030

in a sand dune on a hurricane prone

1071

00:52:50,290 --> 00:52:47,570

beach the hurricane comes along and

1072

00:52:52,540 --> 00:52:50,300

knocks down your house and the people of

1073

00:52:55,000 --> 00:52:52,550

this country spend most of the money to

1074

00:52:59,200 --> 00:52:55,010

build it back up is that a great country

1075

00:53:01,180 --> 00:52:59,210

or what that's seriously there are

1076
00:53:04,660 --> 00:53:01,190
common-sense things that we can all

1077
00:53:07,600 --> 00:53:04,670
agree upon one of them is why in the

1078
00:53:10,930 --> 00:53:07,610
world are we allowing people to build

1079
00:53:13,090 --> 00:53:10,940
back in the area where we know it's

1080
00:53:16,480 --> 00:53:13,100
gonna get hit by a hurricane again at

1081
00:53:19,240 --> 00:53:16,490
the public's expense no you shouldn't be

1082
00:53:20,950 --> 00:53:19,250
allowed to build in that zone

1083
00:53:23,890 --> 00:53:20,960
you should say have to set him back some

1084
00:53:25,120 --> 00:53:23,900
but uh you know let me go back to my

1085
00:53:26,859 --> 00:53:25,130
Beach question though because I love

1086
00:53:29,380 --> 00:53:26,869
beaches I live close to the beach here

1087
00:53:32,020 --> 00:53:29,390
in LA and if the beaches went away that

1088
00:53:33,730 --> 00:53:32,030

would be disturbing to me so back to

1089

00:53:35,530 --> 00:53:33,740

this foot and a half and maybe this is

1090

00:53:37,870 --> 00:53:35,540

not something that you're expert on it

1091

00:53:39,880 --> 00:53:37,880

could really comment on but if the ocean

1092

00:53:42,190 --> 00:53:39,890

was a foot and a half higher than it is

1093

00:53:44,140 --> 00:53:42,200

today I'm trying to think what that

1094

00:53:45,910 --> 00:53:44,150

would do to say what the beach I'm

1095

00:53:48,700 --> 00:53:45,920

closer to which is Santa Monica beach

1096

00:53:51,370 --> 00:53:48,710

for instance we have you know the waves

1097

00:53:54,520 --> 00:53:51,380

here vary from two feet to six foot

1098

00:53:56,559 --> 00:53:54,530

waves in general okay when we get six

1099

00:54:00,309 --> 00:53:56,569

foot waves as opposed to two foot waves

1100

00:54:02,980 --> 00:54:00,319

it comes on to shore a bit more maybe an

1101
00:54:05,770 --> 00:54:02,990
extra five feet ten feet and that's it

1102
00:54:08,470 --> 00:54:05,780
is that what's the title amplitude in

1103
00:54:10,809 --> 00:54:08,480
Southern California the title amplitude

1104
00:54:11,890 --> 00:54:10,819
Michael let's do it though it's

1105
00:54:12,760 --> 00:54:11,900
additional even know what that I don't

1106
00:54:14,950 --> 00:54:12,770
know what that means

1107
00:54:17,829 --> 00:54:14,960
that's different the tides have a

1108
00:54:20,349 --> 00:54:17,839
monthly cycle oh okay and may question a

1109
00:54:22,809 --> 00:54:20,359
Mary mean low water to mean high water

1110
00:54:25,510 --> 00:54:22,819
or lowest low water to highest high

1111
00:54:27,430 --> 00:54:25,520
water you'll find that's a pretty good

1112
00:54:30,220 --> 00:54:27,440
number so if you want to see what two

1113
00:54:35,230 --> 00:54:30,230

feet look like go to the middle of the

1114

00:54:40,630 --> 00:54:35,240

tidal cycle when the moon is neither

1115

00:54:43,390 --> 00:54:40,640

full nor new and then take a look at the

1116

00:54:44,920 --> 00:54:43,400

difference in the amount of beach I'm

1117

00:54:47,380 --> 00:54:44,930

assuming the tidal cycle is probably

1118

00:54:48,910 --> 00:54:47,390

about plus or minus two feet there let's

1119

00:54:56,050 --> 00:54:48,920

take a look at the amount of beach two

1120

00:54:57,640 --> 00:54:56,060

feet okay yeah it looks if we're looking

1121

00:55:01,300 --> 00:54:57,650

at the right thing that it may be about

1122

00:55:04,329 --> 00:55:01,310

two feet okay good so take a look at how

1123

00:55:07,920 --> 00:55:04,339

much beach disappears between the lowest

1124

00:55:10,240 --> 00:55:07,930

water and the highest water and then I

1125

00:55:11,859 --> 00:55:10,250

can tell you what that is at least on

1126

00:55:13,480 --> 00:55:11,869

this beach but then also it goes to the

1127

00:55:15,400 --> 00:55:13,490

pitch of the beach I believe as you're

1128

00:55:17,800 --> 00:55:15,410

pointing out right the flatter yes the

1129

00:55:19,839 --> 00:55:17,810

more impact that's going to have here we

1130

00:55:22,329 --> 00:55:19,849

probably have a bit more of a pitch to

1131

00:55:24,069 --> 00:55:22,339

our beaches than say Miami does but I

1132

00:55:27,520 --> 00:55:24,079

can tell you that the difference is

1133

00:55:28,870 --> 00:55:27,530

probably about twenty feet because I go

1134

00:55:30,609 --> 00:55:28,880

to my beach all the time and I see that

1135

00:55:32,630 --> 00:55:30,619

I see the differences and I would say

1136

00:55:34,460 --> 00:55:32,640

it's about a 20 foot variance

1137

00:55:37,779 --> 00:55:34,470

between okay and look at that I mean

1138

00:55:40,370 --> 00:55:37,789

that's how you kind of stats of rough

1139

00:55:43,039 --> 00:55:40,380

calculation depending upon again the

1140

00:55:48,710 --> 00:55:43,049

pitch in the Welsh local geometry but

1141

00:55:50,750 --> 00:55:48,720

you know then there have been times in

1142

00:55:55,549 --> 00:55:50,760

Southern California particularly on El

1143

00:56:00,880 --> 00:55:55,559

Nino years where there have been major

1144

00:56:05,509 --> 00:56:00,890

winter storms and the wind driven water

1145

00:56:09,380 --> 00:56:05,519

piles up the shore and during the I tied

1146

00:56:13,299 --> 00:56:09,390

it in grasses into people's property

1147

00:56:18,740 --> 00:56:16,039

that would become more frequent let's

1148

00:56:21,230 --> 00:56:18,750

just get a few things randomly cow farts

1149

00:56:24,259 --> 00:56:21,240

is that really a thing or is that just a

1150

00:56:26,690 --> 00:56:24,269

way for the environmentalists to in the

1151
00:56:36,819 --> 00:56:26,700
the vegans to get people to stop eating

1152
00:56:38,569 --> 00:56:36,829
meat it's both I mean ruminants do belch

1153
00:56:43,940 --> 00:56:38,579
both directions

1154
00:56:48,400 --> 00:56:43,950
methane not that much of it by the way

1155
00:56:51,170 --> 00:56:48,410
but you know it's enough to have

1156
00:56:53,930 --> 00:56:51,180
activists have an excuse on this but

1157
00:56:55,220 --> 00:56:53,940
what percentage you know as far as

1158
00:56:59,210 --> 00:56:55,230
contributing toward the hundred percent

1159
00:57:00,890 --> 00:56:59,220
is it the well methane is a more potent

1160
00:57:05,450 --> 00:57:00,900
greenhouse gas than carbon dioxide but I

1161
00:57:09,079 --> 00:57:05,460
think atmospheric methane is increased

1162
00:57:13,940 --> 00:57:09,089
for a large number of reasons not which

1163
00:57:16,009 --> 00:57:13,950

is a lot more than cows and you know

1164

00:57:18,710 --> 00:57:16,019

what people are gonna do here you're not

1165

00:57:22,549 --> 00:57:18,720

gonna stop you're not gonna stop it

1166

00:57:25,160 --> 00:57:22,559

evam cows if the market pressures are

1167

00:57:29,569 --> 00:57:25,170

there and I know research on this is

1168

00:57:32,299 --> 00:57:29,579

going on already you're going to alter

1169

00:57:35,720 --> 00:57:32,309

certain aspects of the digestive process

1170

00:57:37,460 --> 00:57:35,730

in ruminants and dramatically reduce the

1171

00:57:40,160 --> 00:57:37,470

methane emissions and I've seen

1172

00:57:44,480 --> 00:57:40,170

literature on that already that's what

1173

00:57:46,309 --> 00:57:44,490

people do and what is the number one

1174

00:57:49,519 --> 00:57:46,319

driver of

1175

00:57:51,979 --> 00:57:49,529

greenhouse gases you know what industry

1176

00:57:54,890 --> 00:57:51,989

or what what's what you you know if

1177

00:57:56,719 --> 00:57:54,900

humans were looking to curtail something

1178

00:57:59,539 --> 00:57:56,729

what would be the most obvious thing to

1179

00:58:01,189 --> 00:57:59,549

point to to curtail well here in the

1180

00:58:04,189 --> 00:58:01,199

United States we have three major

1181

00:58:06,949 --> 00:58:04,199

sources of carbon dioxide electrical

1182

00:58:09,349 --> 00:58:06,959

generation manufacturing and

1183

00:58:10,880 --> 00:58:09,359

transportation transportation being

1184

00:58:13,400 --> 00:58:10,890

mainly automobiles and over-the-road

1185

00:58:17,660 --> 00:58:13,410

trucks and they're roughly divided one

1186

00:58:19,939 --> 00:58:17,670

third one third one third so you can

1187

00:58:23,859 --> 00:58:19,949

find a convenient target to reduce

1188

00:58:27,400 --> 00:58:23,869

emissions if you want to but you have to

1189

00:58:32,120 --> 00:58:27,410

be realistic and understand compromise

1190

00:58:35,779 --> 00:58:32,130

for example if you change a if you if

1191

00:58:39,069 --> 00:58:35,789

you substitute natural gas for to

1192

00:58:42,019 --> 00:58:39,079

generate electricity in place of coal

1193

00:58:44,359 --> 00:58:42,029

gas is more efficient and it produces

1194

00:58:47,299 --> 00:58:44,369

about a little bit less than half the

1195

00:58:49,819 --> 00:58:47,309

carbon dioxide per kilowatt hour that a

1196

00:58:56,449 --> 00:58:49,829

coal-fired power plant does which is why

1197

00:58:58,789 --> 00:58:56,459

by the way since 2005 the United States

1198

00:59:01,640 --> 00:58:58,799

has reduced its carbon dioxide emissions

1199

00:59:05,329 --> 00:59:01,650

more than any other nation on earth not

1200

00:59:08,420 --> 00:59:05,339

to save the planet but because it was we

1201

00:59:10,910 --> 00:59:08,430

discovered that we can easily break

1202

00:59:14,959 --> 00:59:10,920

rocks underneath the surface fracking

1203

00:59:16,489 --> 00:59:14,969

and get natural gas out I mean some of

1204

00:59:18,140 --> 00:59:16,499

those plants I understand some of those

1205

00:59:19,699 --> 00:59:18,150

Samoa's wells and produced for a hundred

1206

00:59:22,069 --> 00:59:19,709

years yeah and that's the important

1207

00:59:24,410 --> 00:59:22,079

point it had nothing to do with global

1208

00:59:27,529 --> 00:59:24,420

warming it was the good old free-market

1209

00:59:31,400 --> 00:59:27,539

in good old green huh

1210

00:59:34,279 --> 00:59:31,410

yeah agreed yeah right and and you know

1211

00:59:39,410 --> 00:59:34,289

for people who who are concerned about

1212

00:59:45,259 --> 00:59:39,420

fracking I urge you to go visit a modern

1213

00:59:47,180 --> 00:59:45,269

fracked natural gas facility where the

1214

00:59:50,569 --> 00:59:47,190

footprint the surface footprint is just

1215

00:59:52,009 --> 00:59:50,579

minimal and these things produce years

1216

00:59:55,789 --> 00:59:52,019

and years and years and years it's

1217

00:59:57,650 --> 00:59:55,799

really quite remarkable you know it

1218

00:59:59,420 --> 00:59:57,660

wasn't lost on a lot of people studying

1219

01:00:03,680 --> 00:59:59,430

the last election

1220

01:00:06,680 --> 01:00:03,690

that where Clinton lost or where Trump

1221

01:00:08,539 --> 01:00:06,690

won was very very congruent with the

1222

01:00:09,160 --> 01:00:08,549

shale formations in the eastern United

1223

01:00:12,799 --> 01:00:09,170

States

1224

01:00:14,870 --> 01:00:12,809

what about electric cars because they

1225

01:00:19,279 --> 01:00:14,880

have to be get their energy somewhere

1226
01:00:21,769 --> 01:00:19,289
and electricity tends to oftentimes come

1227
01:00:23,329 --> 01:00:21,779
from coal and therefore be the dirtiest

1228
01:00:25,220 --> 01:00:23,339
type of energy so our electric cars

1229
01:00:29,239 --> 01:00:25,230
really good for the environment

1230
01:00:33,319 --> 01:00:29,249
I've seen some end and studies having to

1231
01:00:35,420 --> 01:00:33,329
do with you know mining the minerals

1232
01:00:40,339 --> 01:00:35,430
that are associated with electrical cars

1233
01:00:44,089 --> 01:00:40,349
and then manufacturing and electricity

1234
01:00:48,140 --> 01:00:44,099
and its sources it's certainly not the

1235
01:00:53,569 --> 01:00:48,150
panacea that that people think they're

1236
01:00:55,940 --> 01:00:53,579
gonna be especially if the car is fueled

1237
01:00:57,349 --> 01:00:55,950
by a fossil fuel-fired power plant I

1238
01:00:58,849 --> 01:00:57,359

kept you know when you talk about

1239

01:01:02,120 --> 01:00:58,859

electric cars I'm sorry that brings up

1240

01:01:04,279 --> 01:01:02,130

but a related subject to me

1241

01:01:05,630 --> 01:01:04,289

let's leave California out of this

1242

01:01:09,620 --> 01:01:05,640

because you're so tectonically active

1243

01:01:13,069 --> 01:01:09,630

but still can be taken care of

1244

01:01:16,069 --> 01:01:13,079

the tenancy throughout history is for

1245

01:01:16,549 --> 01:01:16,079

power to become denser our energy

1246

01:01:21,160 --> 01:01:16,559

sources

1247

01:01:28,839 --> 01:01:21,170

once upon a time were fires and caves

1248

01:01:33,019 --> 01:01:28,849

would fire homes coal-fired places

1249

01:01:35,690 --> 01:01:33,029

liquid fuel fired etc then on up to

1250

01:01:38,329 --> 01:01:35,700

nuclear which is the densest source of

1251

01:01:43,729 --> 01:01:38,339

energy that we have nuclear does not

1252

01:01:45,829 --> 01:01:43,739

emit any carbon dioxide and one of my

1253

01:01:49,400 --> 01:01:45,839

measures of a person's sincerity about

1254

01:01:51,890 --> 01:01:49,410

their concern about the climate is if

1255

01:01:54,559 --> 01:01:51,900

they will accept nuclear power as a big

1256

01:01:56,769 --> 01:01:54,569

substitute for both manufacturing and

1257

01:02:03,979 --> 01:01:56,779

transportation

1258

01:02:06,829 --> 01:02:03,989

and powered by a non co2 emitting

1259

01:02:08,089 --> 01:02:06,839

nuclear plant and if they're not for

1260

01:02:10,099 --> 01:02:08,099

that I think well you're really not

1261

01:02:11,930 --> 01:02:10,109

serious because you're not gonna run a

1262

01:02:13,010 --> 01:02:11,940

none solar energy and windmills I don't

1263

01:02:15,890 --> 01:02:13,020

care what

1264

01:02:18,770 --> 01:02:15,900

leadership in the California Legislature

1265

01:02:21,109 --> 01:02:18,780

thinks it's just not gonna be that way

1266

01:02:23,570 --> 01:02:21,119

so what would that person's explanation

1267

01:02:26,120 --> 01:02:23,580

be as to why they believe in global

1268

01:02:27,680 --> 01:02:26,130

warming and that greenhouse gases are

1269

01:02:31,760 --> 01:02:27,690

causing it and we need to do something

1270

01:02:35,510 --> 01:02:31,770

about it but no not nuclear human

1271

01:02:39,040 --> 01:02:35,520

rationality I mean the problem is that

1272

01:02:45,200 --> 01:02:39,050

so many people who are just obsessed

1273

01:02:48,470 --> 01:02:45,210

with climate change are obsessed against

1274

01:02:50,359 --> 01:02:48,480

nuclear power what would be the

1275

01:02:53,750 --> 01:02:50,369

rationale if they if they were arguing

1276

01:02:56,089 --> 01:02:53,760

with you over dinner what argument would

1277

01:02:57,859 --> 01:02:56,099

they put out there as to yeah Patrick I

1278

01:03:01,310 --> 01:02:57,869

hear but I know we should not do nuclear

1279

01:03:03,470 --> 01:03:01,320

because oh well there was Noble

1280

01:03:07,460 --> 01:03:03,480

excuse me Chernobyl was an uncontained

1281

01:03:10,220 --> 01:03:07,470

reactor with an experiment being done on

1282

01:03:14,900 --> 01:03:10,230

it that was highly irresponsible or we

1283

01:03:17,510 --> 01:03:14,910

have Fukushima oh my god Fukushima

1284

01:03:20,720 --> 01:03:17,520

reactor complex was designed so the

1285

01:03:24,710 --> 01:03:20,730

emergency power was between the reactors

1286

01:03:28,579 --> 01:03:24,720

and the ocean so if that was ever gonna

1287

01:03:31,370 --> 01:03:28,589

be a tsunami which that was in a very

1288

01:03:33,530 --> 01:03:31,380

tsunami prone place the emergency power

1289

01:03:36,470 --> 01:03:33,540

was gonna get knocked off and that's

1290

01:03:38,900 --> 01:03:36,480

what happened in Fukushima how about the

1291

01:03:40,490 --> 01:03:38,910

cost of nuclear how does it compare with

1292

01:03:43,220 --> 01:03:40,500

fossil fuels and how does it compare

1293

01:03:46,339 --> 01:03:43,230

with solar well that's that those

1294

01:03:48,500 --> 01:03:46,349

numbers are changing all the time my

1295

01:03:50,570 --> 01:03:48,510

understanding is that there's something

1296

01:03:54,770 --> 01:03:50,580

called the levelized cost has to do with

1297

01:03:56,540 --> 01:03:54,780

the cost to get the resource the cost to

1298

01:03:58,849 --> 01:03:56,550

build the plant the cost around the

1299

01:04:01,550 --> 01:03:58,859

plant cost of transport the fuel all

1300

01:04:02,180 --> 01:04:01,560

that good stuff of the major fuel

1301
01:04:06,260 --> 01:04:02,190
sources

1302
01:04:11,079 --> 01:04:06,270
I believe levelized cost of new national

1303
01:04:16,370 --> 01:04:11,089
natural gas power plant is the lowest

1304
01:04:20,060 --> 01:04:16,380
the highest level ice cost is offshore

1305
01:04:23,150 --> 01:04:20,070
wind and you know you know that's a

1306
01:04:26,720 --> 01:04:23,160
really harsh environment to put rotating

1307
01:04:28,990 --> 01:04:26,730
metal equipment in and it turns out that

1308
01:04:31,490 --> 01:04:29,000
the life expectancy of an offshore wind

1309
01:04:34,670 --> 01:04:31,500
turbine now turns out to be half of what

1310
01:04:37,160 --> 01:04:34,680
they were advertised as in fact

1311
01:04:37,700 --> 01:04:37,170
Germany's now started to get away from

1312
01:04:40,640 --> 01:04:37,710
it

1313
01:04:43,940 --> 01:04:40,650

Germany is building regular natural

1314

01:04:45,860 --> 01:04:43,950

gas-fired plants and they're complaining

1315

01:04:47,930 --> 01:04:45,870

because your natural gas is so expensive

1316

01:04:49,790 --> 01:04:47,940

well it is because they're buying it

1317

01:04:50,510 --> 01:04:49,800

from Russians how about we ship you some

1318

01:04:53,750 --> 01:04:50,520

we got plenty

1319

01:04:56,180 --> 01:04:53,760

you'll undercut their price any time and

1320

01:04:59,260 --> 01:04:56,190

we are for beginning of shift natural

1321

01:05:01,240 --> 01:04:59,270

gas to Europe but not very much but yeah

1322

01:05:03,320 --> 01:05:01,250

you can do that

1323

01:05:04,700 --> 01:05:03,330

ok we're running out of time so let's

1324

01:05:06,170 --> 01:05:04,710

just tick through a couple things real

1325

01:05:10,880 --> 01:05:06,180

quick if you don't mind

1326

01:05:14,030 --> 01:05:10,890

Al Gore what a dumb guy bad guy what's

1327

01:05:16,910 --> 01:05:14,040

your explanation for Al Gore he knew an

1328

01:05:20,390 --> 01:05:16,920

issue that he thought would create a lot

1329

01:05:25,610 --> 01:05:20,400

of power for him and it did he almost

1330

01:05:28,370 --> 01:05:25,620

was elected president and it certainly

1331

01:05:30,740 --> 01:05:28,380

has been a cash cow for him I mean he's

1332

01:05:32,750 --> 01:05:30,750

got that nice new was have an oceanfront

1333

01:05:36,920 --> 01:05:32,760

home in Southern California something

1334

01:05:42,980 --> 01:05:36,930

like that I mean and you can get around

1335

01:05:43,790 --> 01:05:42,990

to it so you know kind of like an

1336

01:05:46,280 --> 01:05:43,800

opportunist

1337

01:05:48,980 --> 01:05:46,290

well I'm not gonna call ina I can't call

1338

01:05:50,780 --> 01:05:48,990

names I work for a company where we're

1339

01:05:53,270 --> 01:05:50,790

enjoying from calling people's name

1340

01:05:56,090 --> 01:05:53,280

people names you so you can you can

1341

01:05:58,370 --> 01:05:56,100

supply your own name what about what is

1342

01:06:02,120 --> 01:05:58,380

the explanation for when you ever hear

1343

01:06:03,830 --> 01:06:02,130

everybody say 97% 98% whatever the

1344

01:06:09,410 --> 01:06:03,840

percentages they throw out of scientists

1345

01:06:10,820 --> 01:06:09,420

agree you know what my dates probably

1346

01:06:16,520 --> 01:06:10,830

aren't gonna be right and I may have

1347

01:06:19,700 --> 01:06:16,530

inverted the baby but around 1975 97 and

1348

01:06:21,110 --> 01:06:19,710

98 percent of all biomedical scientists

1349

01:06:25,280 --> 01:06:21,120

believe that babies should sleep on

1350

01:06:26,840 --> 01:06:25,290

their stomach and five years later 97 or

1351

01:06:29,900 --> 01:06:26,850

98 percent believe babies should sleep

1352

01:06:35,090 --> 01:06:29,910

on their back in fact when you name any

1353

01:06:39,020 --> 01:06:35,100

scientific paradigm issue whatever about

1354

01:06:40,640 --> 01:06:39,030

97% of all scientists probably agree in

1355

01:06:42,470 --> 01:06:40,650

if something comes along that changes

1356

01:06:45,560 --> 01:06:42,480

their mind and then they'll change their

1357

01:06:47,390 --> 01:06:45,570

mind all at once so that figure to me is

1358

01:06:50,510 --> 01:06:47,400

a meaningless figure and by the way

1359

01:06:51,920 --> 01:06:50,520

three percent if indeed it is three

1360

01:06:55,480 --> 01:06:51,930

percent are probably the interesting

1361

01:06:58,160 --> 01:06:55,490

ones well and there's also a groupthink

1362

01:07:01,760 --> 01:06:58,170

element to it and a peer pressure

1363

01:07:03,920 --> 01:07:01,770

element to it correct oh sure

1364

01:07:06,470 --> 01:07:03,930

you ought to take a look at like the

1365

01:07:08,630 --> 01:07:06,480

first 70 or 80 pages of Thomas Kuhns

1366

01:07:10,460 --> 01:07:08,640

1962 classic which is still in print

1367

01:07:13,160 --> 01:07:10,470

called the structure of scientific

1368

01:07:15,020 --> 01:07:13,170

revolutions in which he describes and in

1369

01:07:16,250 --> 01:07:15,030

fact it what scientists do most of their

1370

01:07:18,830 --> 01:07:16,260

careers most scientists for their

1371

01:07:22,040 --> 01:07:18,840

careers to spend their careers agreeing

1372

01:07:24,680 --> 01:07:22,050

with everybody else and supporting

1373

01:07:31,220 --> 01:07:24,690

whatever the reigning paradigm in their

1374

01:07:32,930 --> 01:07:31,230

issue is and then eventually somebody

1375

01:07:34,840 --> 01:07:32,940

comes along and says lists data its

1376

01:07:37,750 --> 01:07:34,850

anomalous and doesn't fit the paradigm

1377

01:07:41,180 --> 01:07:37,760

and the paradigm falls apart

1378

01:07:44,510 --> 01:07:41,190

unfortunately kuhn wrote his book and

1379

01:07:47,660 --> 01:07:44,520

didn't mention that paradigms might

1380

01:07:50,780 --> 01:07:47,670

become stickier and stickier otherwise

1381

01:07:53,510 --> 01:07:50,790

there'd be more reluctance to change if

1382

01:07:55,340 --> 01:07:53,520

we have say had monopoly funding for

1383

01:07:56,870 --> 01:07:55,350

that paradigm and all that funding came

1384

01:07:59,270 --> 01:07:56,880

from a government that had a political

1385

01:08:03,710 --> 01:07:59,280

agenda that is the case in global

1386

01:08:05,690 --> 01:08:03,720

climate change and you know the paradigm

1387

01:08:10,430 --> 01:08:05,700

is really really sticky the paradigm is

1388

01:08:13,010 --> 01:08:10,440

that those climate models work and what

1389

01:08:15,320 --> 01:08:13,020

about the the shaming element of it you

1390

01:08:16,340 --> 01:08:15,330

know I talked about the fact that you

1391

01:08:20,690 --> 01:08:16,350

know if you're against gay marriage

1392

01:08:23,240 --> 01:08:20,700

today you're a homophobe well Obama was

1393

01:08:25,010 --> 01:08:23,250

elected being against gay marriage just

1394

01:08:27,260 --> 01:08:25,020

twelve years ago and now you're a

1395

01:08:30,559 --> 01:08:27,270

homophobe I imagine that if you're not a

1396

01:08:31,610 --> 01:08:30,569

believer in climate change as the

1397

01:08:32,750 --> 01:08:31,620

activists would like you to believe

1398

01:08:34,160 --> 01:08:32,760

there's some type of shaming that's

1399

01:08:36,050 --> 01:08:34,170

involved if you're in the academic

1400

01:08:38,390 --> 01:08:36,060

community well I mean I really don't

1401
01:08:40,070 --> 01:08:38,400
know anybody who's cognizant to that

1402
01:08:42,349 --> 01:08:40,080
spheric science doesn't believe that

1403
01:08:46,849 --> 01:08:42,359
climate changes okay

1404
01:08:50,150 --> 01:08:46,859
and so I guess you can put me in the 97%

1405
01:08:52,880 --> 01:08:50,160
after all I said that probably a

1406
01:08:55,850 --> 01:08:52,890
considerable portion of

1407
01:08:58,240 --> 01:08:55,860
the warming that began neatly 1970s has

1408
01:09:01,700 --> 01:08:58,250
something to do with human activity

1409
01:09:03,380 --> 01:09:01,710
what's not life this cuz I don't think

1410
01:09:05,720 --> 01:09:03,390
the world's coming to an end I'll tell

1411
01:09:07,220 --> 01:09:05,730
you what we can chain people for that

1412
01:09:09,620 --> 01:09:07,230
thing the world's coming to an end and

1413
01:09:12,380 --> 01:09:09,630

you know what

1414

01:09:14,330 --> 01:09:12,390

you do very good go short on Apokolips

1415

01:09:16,670 --> 01:09:14,340

futures I've counted nine environmental

1416

01:09:19,160 --> 01:09:16,680

apocalypses in my life that we're going

1417

01:09:19,970 --> 01:09:19,170

to be the end of life as we knew it life

1418

01:09:22,730 --> 01:09:19,980

as we know it

1419

01:09:25,430 --> 01:09:22,740

global warming is only the reigning one

1420

01:09:28,070 --> 01:09:25,440

right now last question according to

1421

01:09:31,850 --> 01:09:28,080

NASA this is in the LA Times editorial

1422

01:09:35,660 --> 01:09:31,860

18 of the 19 warmest years ever recorded

1423

01:09:37,280 --> 01:09:35,670

have occurred since 2000 the last five

1424

01:09:40,490 --> 01:09:37,290

years have been the hottest since

1425

01:09:44,390 --> 01:09:40,500

record-keeping began in 1880 in July set

1426

01:09:49,690 --> 01:09:44,400

an all-time record true they sure no big

1427

01:09:57,770 --> 01:09:53,500

between about 6 & 9 thousand years ago

1428

01:10:00,320 --> 01:09:57,780

we we know that evidence from fossil

1429

01:10:03,770 --> 01:10:00,330

trees that are underneath the tundra

1430

01:10:06,020 --> 01:10:03,780

that can only have been in Eurasia about

1431

01:10:08,090 --> 01:10:06,030

13 degrees Fahrenheit warmer in July

1432

01:10:09,380 --> 01:10:08,100

than the 20th century average for those

1433

01:10:11,330 --> 01:10:09,390

trees to be growing there

1434

01:10:12,500 --> 01:10:11,340

you think the global temperature might

1435

01:10:16,670 --> 01:10:12,510

have been a little bit warmer then

1436

01:10:18,410 --> 01:10:16,680

probably so you know it happens and but

1437

01:10:21,670 --> 01:10:18,420

here's the thing the thing you got to

1438

01:10:24,680 --> 01:10:21,680

remember we are in a warming trend and

1439

01:10:26,990 --> 01:10:24,690

the warming trend bears some

1440

01:10:28,910 --> 01:10:27,000

relationship to human activity so if

1441

01:10:30,890 --> 01:10:28,920

you're if you're at the end of a warming

1442

01:10:33,050 --> 01:10:30,900

trend the fact that you're going to have

1443

01:10:35,090 --> 01:10:33,060

the warmest temperatures occurring at

1444

01:10:37,520 --> 01:10:35,100

the end the end of a warming trend is

1445

01:10:39,800 --> 01:10:37,530

only logical that's just the way it

1446

01:10:41,600 --> 01:10:39,810

would have to be and that's that's like