

climate-nasa

March 3, 2025

```
[73]: import pandas as pd
import numpy as np
import random
import os
from tqdm.notebook import tqdm
import geopandas as gpd
from shapely.geometry import Point
import folium
import matplotlib.pyplot as plt
import seaborn as sns
import nltk
import re
from sklearn.ensemble import RandomForestRegressor
from sklearn.model_selection import train_test_split
from sklearn.metrics import mean_squared_error
pd.options.display.float_format = '{:.5f}'.format
pd.options.display.max_rows = None
%matplotlib inline
import warnings
warnings.filterwarnings('ignore')
```

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[40]: nasa=pd.read_csv(r'C:\Users\kmuba\Downloads\climate_nasa.csv')
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[42]: nasa
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[42]:
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388	2023-12-16T18:20:51.000Z	3
389	2023-12-15T11:02:48.000Z	3
390	2023-12-15T19:04:09.000Z	0
391	2023-12-15T14:26:45.000Z	0
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393	2023-12-14T17:25:52.000Z	1
394	2021-10-31T16:30:32.000Z	3
395	2021-10-31T16:02:45.000Z	24
396	2021-10-31T20:33:24.000Z	4
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398	2021-11-02T06:13:57.000Z	4
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408	2021-10-31T18:40:27.000Z	34
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415	2021-11-02T08:34:49.000Z	2
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417	2021-11-01T19:20:49.000Z	2
418	2021-11-01T17:36:50.000Z	5
419	2021-11-01T12:49:15.000Z	1
420	2021-11-01T10:46:34.000Z	19
421	2021-11-01T07:50:31.000Z	0
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423	2021-11-01T05:26:12.000Z	0
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425	2021-10-31T23:38:16.000Z	15
426	2021-10-31T21:04:51.000Z	37
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371	0bcd63d07789f34850c3fda4f2357540182c7b51b7f576...	1.00000
372	09cbaecd2d25d6fb92629b621b106b996ad3fc15141a9f...	10.00000
373	85c65238676444646cbdf4d514910dfd1eececef5b27a...	NaN
374	499b207f874ce041b349f13dea7ea8f38be0ca1b8bb30f...	NaN
375	9ecac71aabe95e6caa8bd55e7f575130ce8daebe7b41d...	2.00000
376	683ee664d58d804c84121edbcbad86391cbf93b882273...	17.00000
377	7e7fd22eba5a027ef7f26b559b1b101da0ca5d5ad2a8e0...	4.00000
378	b05ff559e20d705e5f3d8415d1838a85c4b5e8e3bcb164...	6.00000
379	4118b45992b63b70fe2da5e44aefbca7a7a703e332ec78...	19.00000

380	9e17b1a6422032d47472f0216c73aafda7587e302eed5e...	4.00000
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383	548dadd0adb832196d21f4f171ab9d787c95ae7a841f69...	93.00000
384	aa3ce139884e53183a1c08974755916dbf6a5fa0790825...	NaN
385	81698be4aa2b59158f46784b9a6527c0128bb103d43bce...	1.00000
386	a69f929cf97876f7eeea2aef2e38c0e6841a26d23706b3...	NaN
387	b06c2f96e973e8f4be047dfed18c9c66d7e105cc6fe041...	NaN
388	3650304abc3fb290ed8533f09925b8c41cb6101256efcf...	9.00000
389	80a21c7b1cb08638aefec4f2a1ef9cff733c43809eadc7...	1.00000
390	31d04856a5a6169f6732b9aeecc321ad25a18fd8fc67d6c...	NaN
391	54f2fb95532a2d99360a47f9959dea084ae8130f834bc0...	NaN
392	2ab87e20bd4e2c125d00743b1f9a0d0678e40cbd913899...	NaN
393	b8d96e124251a43b0bd80ae87ad5eefb24c2d6028b5e7c...	NaN
394	5d20cdd169bb3f04f5fbae8284be51d3610ebc9728eaf7...	17.00000
395	461e201ee5cca5aa3f37e4763e406125f3dace1ac24262...	18.00000
396	1568d17e34dbe5bcd0bd73c0d9d10cfb2aa67929738b40...	14.00000
397	99459d1c18c5166316e5546a6f29c49a7fdfbec7b95d89...	72.00000
398	18bccd2792a484476500a62947b4a345920f05db89a80d...	NaN
399	6edf2d9e184c83cdb0ba318a0bb063d6547828338eba5d...	NaN
400	be7602e4a42bf0ad5e7cbc602fcc62d6f88f767b26be02...	1.00000
401	fbcd7d1a96db0c682c8caaaf292d13527b1483b341da109...	NaN
402	ec4125901cbb325d429f3fbba2e7a6cadcb71415b2782c...	NaN
403	ff30dbae361b3c6b14e43e759d2aa882cbeae4ef9ae3b2...	NaN
404	e80927c091be3a235a3ef57ff84ff9cb668b1ab2c9803f...	NaN
405	68f5758e1b531f9118562b0c78f8606d91ea3bd8cb771c...	NaN
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407	0bb66a6c33716a43e2448a113ccffce2827668d5a12f59...	NaN
408	99459d1c18c5166316e5546a6f29c49a7fdfbec7b95d89...	30.00000
409	d4d1d3689c0defaf3a526d83d98adb36ddf04343631f79...	1.00000
410	fe727a6a649c666e3eb9e2553adc06a94f7663bf9053e3...	NaN
411	aacafc46d82db34acb67ac0f69268192716b56ec9f91a8...	NaN
412	cb81cb65c265922904dc9755d302b814f1c8296eccea91...	3.00000
413	88afa826c029517a4858cdeaccd467d3b262a815be1164...	NaN
414	1bd7ddaad91e4cc66779a66d77350bc834cb9dae69109b...	NaN
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416	2b99cf25ff9713898208a0b585c9fdf6bf9c09a5bbcc1b...	11.00000
417	eadd85535ebb66f5d32d12d9da3497d6429e49d935a36c...	NaN
418	e26cb43d3bff07af20d5156b206f42a6a610bdc148308d...	NaN
419	6e35f557966fe6702eea3eb502caeb7bd49ccf53099129...	NaN
420	b30b11aa9dbdae2cf34c9907f667ea8cfc36f92f7c9bec...	3.00000
421	23ef84d46c4ddc62792a34b98009f5a6a11dea9c6c4cfa...	NaN
422	c11791073c2168fa6ff3e7b1e84d3a54f721f1a56c4935...	NaN
423	fe4162cb0c4d5ad6c978dec0a16477142ec53b30589f83...	2.00000
424	c7a747247f41969bd15e78e8310de4313c364bda6a3b21...	NaN
425	4756e2a02b34da303650c29f10fa67343b21163e0cfb84...	NaN
426	bc7395db440ad515dd9d0c84fcf8e8d844db8b3d02d8a3...	NaN

427	1c544111b75e56596f09053397579f1724dcd7b1ae96f5...	52.00000
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430	9dffea32981f03a206547a8639d3356b4c0ae56d5a3360...	NaN
431	c91e196367139dc6449a65ebae5994b59077a4c3891f17...	NaN
432	2fa391d7c43d3af695b330f108aea5f5387137ccdebb40...	NaN
433	e0d27ee7aba5366ee0cfa5b8b0c1f60551d805c253d46d...	14.00000
434	06beccb37b8dfd8c0c54c6be67ad4df2320d2aa9eb9195...	NaN
435	23a6f733194fbef9747c804bc931d76c5977d2a07c9932...	4.00000
436	72b8586fb2583af41c07ad048ac7acb26fc68646b206b5...	8.00000
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441	3e9c52fb5e765da0ea91b66bb1f44ac63db07c6b99e6fa...	27.00000
442	06c157adbace820ac323ec2c6af6ebffc51c26080bb75a...	1.00000
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453	b8bcb9b66a1851504112ad8e351bb92d60c8c4ab4f6084...	NaN
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455	f63b1307f5de51de9a6993f1390ca17a1778e24e0e49d1...	2.00000
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457	df64ca94aa8d663c41ffb0a33a95c68d26f6e2b59f1619...	NaN
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463	26f411eac4e143e925a889c27a6d3cbdb774a7f9158dec...	NaN
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481	c4f497be2f0792fac2fa8a5baa4521961cd58e2c9e975a...	NaN
482	1438243e6e436c837a4790d5dc3c78d4e470639fb4bb50...	NaN
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520	a87c8aea74c9b97002b368d6143ce9c2809dcaec3103fb...	NaN

text

0 Neat comparison I have not heard it before.\n ...
1 An excellent way to visualise the invisible! T...
2 Does the CO2/ghg in the troposphere affect the...
3 excellent post! I defo feel the difference - o...
4 Yes, and carbon dioxide does not harm the Eart...
5 Excellent example...very relatable to the Gen ...
6 I am so proud of whoever created this content...
7 Has the Earth ever had a concentration of over...
8 Yes, and not even half a cup later that poor s...
9 Historical co2 data would make it an interesti...
10 why the northern hemisphere warm more than the...
11 So what are we gonna do about it?
12 Yes. I fall asleep on decaf and stay awake wit...
13 Plus you can literally measure the heat retent...
14 The two most abundant gases (nitrogen and oxyg...
15 That's an excellent way to illustrate 400 ppm.
16 I find it interesting when people claim that C...
17 Love this post! Great pedagogy
18 Kathy Schulz
19 Before of after I drink it?
20 That's a good analogy. \n\nI have thought that...
21 Great advice!
22 Thanks for sharing
23 Excellent
24 Not if its good coffee beans, \nNot until I ge...
25
26 *****
27 Hlw
28 decaf is like mouth to mouth were as caffeinat...
29 Maybe this is what happened to Mars...we messe...
30 It is not the average temperature that is impo...
31 It's always fun watching dropouts pretend to a...
32 Whenever NASA posts good, peer reviewed scienc...
33 Due to more carbon
34 Maybe if Fox had investigative journalists the...
35 By 2050....12-18 inches as the rate continues to...
36 You simply can't mess with science and the dat...
37 Cue the science graduates of the universities ...
38 That's horrendous
39 Say bye bye, Florida.
40 Sustainability VS Stability of climate change ...
41 Dutchy Holland maybe you better move up a leve...
42 Yet so many westerners don't believe or unders...
43 Di pulau Jawa Indonesia sering gempa sekarang

44 Andrew Bidi apropo de conversatia noastra, am ...
 45 The "greenhouse effect" is concerned with the ...
 46 No to plastic pollution
 47 I was born in 1960 and spend a lot of time out...
 48 We all have to move to the Sahara desert and u...
 49 So when did we start directly measure temperat...
 50
 51 Earth Sun Screen - We as Collaborative Earthli...
 52 This is what The CREATOR says about Climate ab...
 53 Awesome! Maybe I can start growing palm trees ...
 54 If climate action is also important to you, do...
 55 Please urge your political representatives to ...
 56 Republicans would rather boil the planet and d...
 57 Planet Earth is warming up fast. Hurricanes, ...
 58 Now they're aware.
 59 How can the heat of the planet be measured acc...
 60 I guess we need to do more to reduce CO2 emiss...
 61 NaN
 62 nothing to see here folks...move right along..
 63 I'm in disagreement with someone that says tha...
 64 We are speedrunning global ecosystem collapse.
 65 NaN
 66 NaN
 67 Wonder what's causing these heat waves. And wh...
 68 Joni Shepherd Silva Charles Silva
 69 Genesis HC
 70
 71 CC? NO way to predict ACCURATELY!!
 72 <https://m.youtube.com/watch?v=2XuAhOnWQh8&pp=y...>
 73 Don't worry...the very uneducated oil sycophan...
 74 <https://linkso.medium.com/why-the-latest-on-cl...>
 75 Suzie A. Woodruff-Gray
 76 NaN
 77 NaN
 78 Dear world, if there was ever a time for the w...
 79 Thank you NASA Climate Change. Your patience ...
 80 I miss my " old school America" where we turn...
 81 Thank you Nasa for explaining the scientific e...
 82 I'm amazed that we've been warned since the 70...
 83 And in the last 20 years the variance is reduc...
 84 The question is, how can we help? Each of us c...
 85 Time to really do something different. Time to...
 86 Only 140 years of data?? C'mon now! We've been...
 87 I don't understand the graph, what does it all...
 88 My question is to NASA. The air in a greenhous...
 89 Humans are not understanding life on earth bec...
 90

91 we all on the same boat. i think if we didn't ...
 92 omg. the slope of the blue line, then the yel...
 93 Thank you NASA for continuing to highlight thi...
 94 Sukhwinder Singh
 95 I don't know much but I think humanity need's ...
 96 As I understand it, even if we reduced emissio...
 97 Anthropogenic global warming is one symptom of...
 98 Someone forgot to mention to Florida that she ...
 99 Hot!
 100 I'd like to go back to 1880, please.
 101 How has The Sun changed in 100 years ..is it ...
 102 Climate change is a made up scenario from the ...
 103 The deniers always with the same statements, a...
 104 Taking a 140 years of temperature readings on ...
 105 I havent seen any difference anywhere. Go ahe...
 106 Why don't some people believe in science? I ju...
 107 Remember the planet that we live on also went ...
 108 Can we also get a data to the left of 1880?...
 109 The difficulty in arguing science with a scien...
 110 It's worth remembering that land surfaces (red...
 111 The three eruptions from 1880 through 1920 dum...
 112 I thought it's stock market chart with indicat...
 113 So in 140 years we have a temperature anomaly ...
 114 Scientific denial, are we coming to the Middle...
 115 Wow, cool! Or rather: not so cool!
 116 What caused the cooling after WW2?
 117 When are we going to do something?
 118 Y vamos pa´riba...
 119 From where we can download this data?
 120 I hope for the Best., but it's Still Hot., an...
 121 It is going to get very bad.
 122 We have also in the UK lost much of our sea gr...
 123 We need to do two things to ensure our species...
 124 Oh my. I think there needs to be more done tha...
 125 Its about to be a survival for the fittest, wh...
 126 I love watch NASA dunk on people who think the...
 127 If I were a gambling man I'd look at the patte...
 128 " Where do you think September 2021 will be? ...
 129 Lies compare the actual recorded temps to this...
 130 Are these the same 'Scientist' that claimed we...
 131 Can you show the correlation of earth temperat...
 132 Our magnetic north has moved 30 miles a year s...
 133 Are you looking at sunspot data since they hav...
 134 Need to spread your data out. Not saying we as...
 135 Why do Climate Change scientists never show up...
 136 We have Billions of asphalt on earth. World is...
 137 What causes the earths core to increase? And h...

138 Theory is Free all the Dammed Rivers in the wo...
 139 Do you not know that the axis has moved move t...
 140 What are you going to do about Mars. Mars is w...
 141 Here is the real story. It shows about 140,000...
 142 Isn't it disingenuous to show increase in temp...
 143 Why start in 1951? Go back at lest 1000 years ...
 144 Hi NASA can you explain to me why this year wo...
 145 No accountabilty for the fact our north pole h...
 146 I'm afraid NASA has been added to my list of a...
 147 NASA Climate Change Thanks for all the work an...
 148 It,s Called Fall
 149 Where are the graphs for the Roman Warm Period...
 150 Climate change is a political issue created by...
 151 Hasn't our climate been warming since the ice ...
 152 All this crap is based on false information so...
 153 What about 1936, very convenient to start at 1950
 154 The VAST majority of Earths history has been a...
 155 Has a lot to do with the sun,
 156 Wow, we are almost as warm as we were in the m...
 157 Can you continue back further in time, by what...
 158 We never had climate change till they strady s...
 159 Anyone else think climate change is a natural ...
 160 Alright... so who caused the ice age?
 161 Moonlandings, climate change, covid, etc are h...
 162 Southern hemisphere?
 163 I remember in the 70's everything was about a ...
 164 Summers are getting hotter and winters are get...
 165 The Southern Hemisphere has gotten colder, wh...
 166 Is there a reason the change escalates so dras...
 167 How does one go about taking the earth's tempe...
 168 Why start at 1951?
 169 Oh, don't worry - \nprez said that soon it wil...
 170 Climate change is real
 171 Global warming , it's happened before , it's h...
 172 What was the reason for the dust bowl in the19...
 173 It's not all Climate change believe me there's...
 174 Link doesn't seem to be working, can you repost?
 175 "I dont think science knows!"
 176 The climate is changing but it's ridiculous to...
 177 Re ord being from 1860 something...lolol
 178 The sad thing is that if we look at projected ...
 179 Don't worry. It will start getting cooler now...
 180 Lower
 181 unfortunately
 182 Can we speak about a climate change based only...
 183 Okay Students...repeat after me truth NUCLEAR ...
 184 If Christians actually read their Bibles they ...

185 One (1) degree C in 140 years...\n\n...got it
 186 That is only 150 years of data. Periods of glo...
 187 Excellent reports by NASA. Too bad be are liv...
 188 Dalton Van Stratten this is interesting!
 189 NASA climate, thank you
 190 Andy Welborn
 191 Our Planet is Hotter!!!\nAnd Climate Change is...
 192
 193 We are still at the tail end of an ice age. \n...
 194 Earth goes through these cycles every so often...
 195 So, what you're say is we need more volcanic e...
 196 Thank you for posting..and replying to the idi...
 197 My understanding is that you don't account for...
 198 How much do this contribute to the sea level r...
 199 Let's see an eon of comparison...this short a sa...
 200 115 Times More Than Man\n\nhttps://scitechdail...
 201 Think how to neutralize the global warming?
 202 Quit chopping down all the forest maybe that m...
 203 Meziah Jolley what money, exactly?
 204 Blah blah blah. There is nothing man can do to...
 205 The 'die back' Is going to be horrendous.
 206 .98 Lowest smoothing
 207 I'm STILL waiting for that Next Ice Age scare ...
 208 sad that its just a matter of time now.
 209 Denying human involvement in climate change do...
 210 Oh dear
 211 Ruth Crowl Frank Bulbeck. Wow..
 212 Thats correct. There is a pattern also that al...
 213 I'm kinda surprised that the trolls blaming "E...
 214 Hey NASA any chance you could give us your ann...
 215 A really good analogy of the effect of CO2 in ...
 216 What confuses me is if this coat is getting "p...
 217 How can we stop increasing the amount of CO2?
 218 Question to NASA. How do you calculate these a...
 219 How to drink water .How to observe.maybe .
 220 In 1750 how were they able to know the CO2 in ...
 221 In terms raw CO2 ppm, the difference between n...
 222 You know how people say "The Earth's climate h...
 223 I think the emission of greenhouse gases will ...
 224 By 'people' hope they refer to the BIG GREEDY ...
 225 Great metaphor
 226 Excellent analogy
 227 I love, and hate how NASA needs to use a 1st g...
 228 Actually with current pledges in emission redu...
 229 I hope that each country should be reminded of...
 230 NASA Climate Change Is it not a bad idea to st...
 231 People co-evolved with other organisms like fu...

232 Are you similarly confused by the all-time rec...
 233 thank's of Philosophy share knowledge..., Part...
 234 In the 70s we had fuel restrictions, general s...
 235 Sadly
 236 James Procak because the expanding heat allows...
 237 Manuel Edgardo Lugo Recart
 238 NaN
 239 We need fast and urgent funding to deal with t...
 240 Brody Smith
 241 Jim Vb
 242 #ClimateChange #JPL #Anthropocene\n[https://ww...
 243 Mean while we continue to destroy the natural ...
 244 Taking advantage of the naive. Climate has bee...
 245 Your predictions are based on FAKED computer p...
 246 This earth has been changing since its concep...
 247 Exactly how long have they been keeping record...
 248 If the greenhouse gas carbon dioxide is gettin...
 249 Cut the crap. In the 70's the so-called expert...
 250 Time has already long-run out to make any diff...
 251 Temperatures rising are from rising magma, tha...
 252 BS, the democrats are behind this, 1 volcano c...
 253 Can you show us a 100,000 year graph? Can you ...
 254 Climate change is and always has been in full ...
 255 I wish this was simply old news and we had peo...
 256 Is there anyone in NASA that can explain clima...
 257 Thank you to all of you at NASA Climate Change...
 258 The current ruling class, who has control over...
 259 Most of the disasters that you talked about. I...
 260 Wow! Well, I suppose the ultimate expert on GW...
 261 The fastest way to reduce car emissions is to ...
 262 To keeping our families. Together and work on ...
 263 These people in the comment section who haven'...
 264 The data is there, scientific information is t...
 265 Plant more trees stop building malls build in ...
 266 Changes to our climate are from our magnetic f...
 267 Natural disasters. Hard to security? I wish th...
 268 Global warming seems to be accelerating.
 269 Glaciers are melting, sea levels are rising, ...
 270 It's as close to you as Air.. We must go to So...
 271 But it seems to me that wildfires does not hap...
 272 I am a outdoors man in baltimore for 53 year's...
 273 All this is the real truth but only our presid...
 274 All I can say about all these changes----- I k...
 275 We need to combat climate change so that the p...
 276 The academic consultants to IPCC (Internationa...
 277 There are many factors involved and I am not g...
 278 Best Aug we ever had here? But maybe a protes...

279 What's this, like the 19th hottest year on rec...
 280 What happened between the 20's and 40's? What ...
 281 Please send this informative article to our sc...
 282 That is going to give Wyoming a wonderful year...
 283 The reason to all this happened because our pl...
 284 There are lots of new things happening in our ...
 285 The hottest decade was the 1930's, and still i...
 286 We all play a part...as a world we need to do...
 287 NaN
 288 Did you know that climate records only reliabl...
 289 Northern hemisphere summer
 290 Pensé que estaba sola en el tema de salvar el ...
 291 Pois e preocupantemas acreditem no actual pres...
 292 What would happen if we had Global Cooling????
 293 The comments on this post are terrifying, didn...
 294 1 degree change? Am I reading this right?
 295 Great Science!! Hard to deny!
 296 The comments are a fun read. Entertained by th...
 297 Lokepasa ke usa tiran mucho plástico y eso est...
 298 quick search says change by 1.5° C is 2.7° cha...
 299 Oh my ... climate change effects us all
 300 Humans we are terrible to our planet.
 301 Donald Trump; Does Not Believe In Global Warmi...
 302 So glad NASA doesn't let the trolls and denial...
 303 Its crazy how people negate science like this...
 304 I wrote a very researched term paper in 1999 o...
 305 Es triste todo lo que esta pasando todo se des...
 306 Do not agree with climate change
 307 More love , tu ecologic tying positive, bendy...
 308 The earth does have a 1/2 life.
 309 Save the planet
 310 Gracias ami tambien me da mucha tristeza Como ...
 311 Yes thank you were dead in November
 312 Ivy Pantel-LaForge\n\nThe comments on this pos...
 313 move to south pole
 314 Its to late check mate
 315 Pues ay que aser algo para salvar nuestro plan...
 316 After all these decades protecting and informi...
 317 It was "global warming" until science noticed ...
 318 \nNASA wants you to believe that man is the so...
 319 NaN
 320 Also people are forgetting about the delay fac...
 321 I'm in southern Ontario Canada and we are bla...
 322 NaN
 323 Bruce Threlfall
 324 In deed.
 325 Hello PEOPLE its Happening in our Lifetime

326 INTERESTING
 327 Ya it's going to happen
 328 Soooooo
 329 .
 330 Thanks
 331 NaN
 332 Dont agree
 333 NaN
 334 We are the
 335 Among other things too !
 336 NaN
 337 Wake up people's!!!!
 338 NaN
 339 Fake.
 340 NaN
 341 NaN
 342 Vote
 343 Msfloodprevention.com\nSave lives and land
 344 I can't help but notice the hot spots on the w...
 345 This is becoming a trend, for those that are n...
 346 Good game forfeit at 2024
 347 does the solar maximum affect \nthe earth's co...
 348 Ok but what about like the 5 billion years bef...
 349 So much denial propaganda from those who don't...
 350 Not every day of course, but we've been having...
 351 Caused by human activities is the biggest lie...
 352 And the denialists and conspiracists show up e...
 353 Our government promotes fear for funding, if y...
 354 One thing is common among climate change denie...
 355 If you can't give me a basic description about...
 356 From another site\n\nThe climate change hoax h...
 357 and the solar flare high activity has nothing ...
 358 I love this weather couldn't have a better win...
 359 That normal because we are entering 12000 cycl...
 360 We forgot a huge informations about climatic c...
 361 I thought we are having an El Niño
 362 John Kerry to the rescue with his private jet.
 363 This is what happens when politicians are in c...
 364 NASA is a reliable source ; I really dont unde...
 365 La tendencia del calentamiento se mantiene, ge...
 366 I wonder if over population has anything to do...
 367 Did the Canadian wilfires have an effect?
 368 Vielleicht ist ja die Nordhalbkugel zZ etwas m...
 369 My friend Ben Ben thinks climate change is a h...
 370 What agenda is NASA pushing now?
 371 Joe has it all figured out how to fix it.
 372 Everyone knows what's going to happen, why it'...

373 oooooohot....oooooobad
 374 NaN
 375 And?..
 376 Move the thermometer back to where it was then...
 377 What is the reason of this global augmentation...
 378 After Human extinction, carbon in the atmosphe...
 379 November and December has been the coldest eve...
 380 Back in the 90s, we used to wear sweaters on c...
 381 Edward Motzi This sounds like you:
 382 ,there's still plenty of flat earthers around.
 383 It's all happened before.
 384 Y cada año será más caliente
 385
 386 There is no time
 387 Heavy rain Heiker Mendozaa
 388 NaN
 389 Bs
 390 At a rate of 10-20 breaths per minute, join th...
 391 These turd stains think it's funny.
 392 Fake garbage nasa lies
 393 BS.
 394 AGW is not linear.
 395 Cue The deniers screaming over this being fak...
 396 Note that the climb really starts in 1980 - ex...
 397 You are being gas-lighted. Have any of you hea...
 398 To me it's just amazing to see how locked in t...
 399 That's one scary "Graph" Costume
 400 NASA Climate Change Can you post graphics of i...
 401 Yep! I remember cooler Halloweens!
 402 When will we all agree to just stop burning st...
 403 As soon as possible we should change our lifes...
 404 I wish if I shared this I could also share all...
 405 Erin Haas Brassil check out the Anoka referenc...
 406 Scary!
 407 Our planet, and especially Earth's ecosystems,...
 408 Here is what you need to know about Climate Ch...
 409 What do we do? Congress is negotiating away p...
 410 A good visual representation of those memories...
 411 Jusst Jess
 412 Carbon increases, oxygen decreases.\n\nIs ther...
 413 The industrial revolution was the beginning of...
 414 Woah, NASA had the scariest Halloween post I've...
 415 NASA Climate Change can surely drop the mic no...
 416 At about 8243 B.P., there was a 3C rise in glo...
 417 I am not blaming or deamonizing industrializatio...
 418 Give up NASA, internet has liberated its "Goog...
 419 Fact !! During the 1950s houses built in miami...

420 Thanks for defining 'anomaly' in this context...
 421 The Mother Earth is in sorrow. Can we do somet...
 422 The evidence screams that we're on a collision...
 423 If it is a recurring cycle; why don't we plan ...
 424 So depressing
 425 "Do you remember the famous 97% study - that 9...
 426 As Elizabeth Kolbert said in her book, "The Si...
 427 Too bad we don't see Oct 1821 or 1721, just ke...
 428 Scary! This is a great graphic to remind every...
 429 Wow! 100 years this year! I didn't know that.
 430 Jimmy Valmer
 431 You are a big liar.\nThe Earth is Flat.\nThe W...
 432 Small consolation, but it'll be in the high 60...
 433 I can only hope to someday attain the level of...
 434 Great post NASA Climate Change. No doubt the f...
 435 Weather is not climate! Climate allows extreme...
 436 It's amazing that well educated people I know ...
 437 thank you for the research you do, and for sti...
 438 Perhaps there are new lives being born who wil...
 439 It's been getting warmer ever since the end of...
 440 What PPM were the CO2 levels in atmosphere abo...
 441 Do you have another graph for before 1880?I li...
 442 The deniers don't realize that it may be 20 de...
 443 NASA Climate Change how well were climate stat...
 444 Temperature increase was constantly rising up ...
 445 please...NASA Climate Change ...\n ...
 446
 447 How at some stages like 1900 to 1920 temperatu...
 448
 449 The next time you're sitting in bumper to bump...
 450 To those who cite a very cold day as evidence ...
 451 In our area of the country (Pa) a lot of the s...
 452 politicians keep your hands off our scientists...
 453 Funny how every winter after a big blizzard, t...
 454 Men argue. Nature acts.
 455 Never seen loess spelled that way. Must be Ame...
 456 Despite amazing scientific research, not a sin...
 457 How can we bring students who are lacking skil...
 458 You've wrong. It's been warming since the last...
 459 Wow, crazy stats.
 460 How anyone can think we have had no impact on ...
 461 Subir un Grado es demasiado!
 462 So if people are the cause, how do you explain...
 463 Weather is like the clothes you wear on a part...
 464 Pourquoi prendre le mois de décembre ? Ok c'es...
 465 Nous accélérons toujours depuis 1990
 466 Just because NASA can't say #HumanCausedGlobal...

467 Started with the Industrial Age, 1880's - and ...
 468 For you deniers I'm just going to say this in ...
 469 So many Muppets trying to argue with scientist...
 470 I'll bet they were talking about a global cool...
 471 <https://www.barnesandnoble.com/w/the-great-cli...>
 472 All fake numbers again
 473 Many people do not understand some very basic ...
 474 You people are absolutely nuts
 475 The "greenhouse effect" is concerned with the ...
 476 Is CO2 Earth's Thermostat?\nCarbon dioxide has...
 477 <https://www.facebook.com/reel/3246160055626064/>
 478 '
 479 Kevin Lay
 480 Look at this phone case \nbit.ly/3XmDT8c\nWhat...
 481 emen
 482 'Fact'['V-x'![[]]Ray]'y[2]' , , ,
 483 This is our fault
 484 You show em!
 485 NaN
 486 Iqbal Badruddin
 487 A very real concern !!!!
 488 Someone send this to tRump !!!
 489 Anneliese Garcia
 490 Just like our government denies that there is ...
 491 Some people want to leave Mother Earth and col...
 492 Imagine working at NASA after a life of study ...
 493 Yes, but, the U.S. mean temperature anomaly , ...
 494 Oh well at least it's not 1.5c, just 1.44.
 495 "The 1.5'C Paris Agreement red line is dead an...
 496 I presume this 'burst' of heat is El Nino rela...
 497 My fear is keep crying wolf and when the wolf ...
 498 A cause de l'activité humaine et pourtant ...
 499 And this is going to be hottest December on th...
 500 A terra não tem 100 anos, nem 1 milhão de anos...
 501 In my opinion, there is no such thing as a phy...
 502 Waiting for the science illiterates to come te...
 503 Gosh if only people had been warning about lit...
 504 Deniers simply do not care. I fear us humans h...
 505 second order trends too.
 506 And the destabilization of the polar vortex is...
 507 The clue is in the adjective "global" . There...
 508 The world's population has been increasing too...
 509 Definitely not the case. The last snowy Christ...
 510 The only solution is back to nature.
 511 Then don't use some very hot days in the summe...
 512 Also climate change involves severe weather of...
 513 With cold temperatures, ignoring change in alb...

```

514 Thank you.\nDo you happen to have a global tem...
515 "Ice On Fire" documentary presents a through e...
516 Deniers will continue to be deniers because th...
517         One can only hope for a peak
518 what is the error margin for the temperature e...
519 We all should volenteerly help in reducing Glo...
520         Sergio Yepes
521 We're experiencing severe, abnormal weather pa...

```

```
[44]: nasa.head()
```

```

[44]:
      date  likesCount  \
0  2022-09-07T17:12:32.000Z      2
1  2022-09-08T14:51:13.000Z      0
2  2022-09-07T17:19:41.000Z      1
3  2022-09-08T00:51:30.000Z      4
4  2022-09-07T19:06:20.000Z     16

      profileName  commentsCount  \
0  4dca617d86b3fdce80ba7e81fb16e048c9cd9798cdfd6d...      NaN
1  518ab97f2d115ba5b6f03b2fba2ef2b120540c9681288b...      NaN
2  d82e8e24eb633fd625b0aef9b3cb625cfb044ceb8483e1...    3.00000
3  37a509fa0b5177a2233c7e2d0e2b2d6916695fa9fba3f2...      NaN
4  e54fbabd42a729af9d04d9a5cc1f9bbfe8081a31c219ecb...   26.00000

      text
0  Neat comparison I have not heard it before.\n ...
1  An excellent way to visualise the invisible! T...
2  Does the CO2/ghg in the troposphere affect the...
3  excellent post! I defo feel the difference - o...
4  Yes, and carbon dioxide does not harm the Eart...

```

```
[46]: nasa.info()
```

```

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 522 entries, 0 to 521
Data columns (total 5 columns):
#   Column          Non-Null Count  Dtype
---  -
0   date            522 non-null   object
1   likesCount      522 non-null   int64
2   profileName     522 non-null   object
3   commentsCount   244 non-null   float64
4   text            504 non-null   object
dtypes: float64(1), int64(1), object(3)
memory usage: 20.5+ KB

```

```
[48]: nasa.describe()
```

```
[48]:      likesCount  commentsCount
count    522.00000      244.00000
mean       4.72031       8.69672
std       12.05356      12.26618
min        0.00000       1.00000
25%        0.00000       2.00000
50%        1.00000       5.00000
75%        4.00000      10.00000
max       126.00000      93.00000
```

```
[50]: nasa.tail(5)
```

```
[50]:      date  likesCount  \
517  2022-12-22T17:21:37.000Z      0
518  2022-12-22T17:19:51.000Z      1
519  2022-12-22T17:12:57.000Z      3
520  2022-12-22T17:01:12.000Z      1
521  2022-12-22T17:00:08.000Z     12

      profileName  commentsCount  \
517  9e17b1a6422032d47472f0216c73aafda7587e302eed5e...      NaN
518  48e55d898603a136aefc44771f248bffd67242583a462a...     5.00000
519  ca5d2611814cf8c9844ed06d9916d876d2dba94dac5ff2...      NaN
520  a87c8aea74c9b97002b368d6143ce9c2809dcaec3103fb...      NaN
521  cc70f6c9dcc2637b1c5fd90046834612627c752b828cb4...     1.00000

      text
517      One can only hope for a peak
518  what is the error margin for the temperature e...
519  We all should volenteerly help in reducing Glo...
520      Sergio Yepes
521  We're experiencing severe, abnormal weather pa...
```

```
[52]: nasa.isnull().sum()
```

```
[52]: date          0
likesCount       0
profileName      0
commentsCount    278
text            18
dtype: int64
```

```
[54]: nasa.shape
```

```
[54]: (522, 5)
```

```
[56]: nasa.columns
```

```
[56]: Index(['date', 'likesCount', 'profileName', 'commentsCount', 'text'],  
      dtype='object')
```

```
[58]: nasa.nunique()
```

```
[58]: date          522  
     likesCount    41  
     profileName  483  
     commentsCount 39  
     text         503  
     dtype: int64
```

```
[61]: nasa['date'].value_counts()
```

```
[61]: date  
     2022-09-07T17:12:32.000Z    1  
     2023-12-14T16:59:04.000Z    1  
     2023-12-14T22:37:45.000Z    1  
     2023-12-15T04:40:57.000Z    1  
     2023-12-15T22:42:43.000Z    1  
     2023-12-14T18:02:20.000Z    1  
     2023-12-17T16:43:53.000Z    1  
     2023-12-16T17:07:11.000Z    1  
     2023-12-17T16:40:35.000Z    1  
     2023-12-14T18:14:16.000Z    1  
     2023-12-14T18:40:45.000Z    1  
     2023-12-20T18:15:56.000Z    1  
     2023-12-14T21:44:26.000Z    1  
     2023-12-14T20:00:40.000Z    1  
     2023-12-14T18:54:00.000Z    1  
     2020-09-15T22:32:01.000Z    1  
     2020-09-15T22:59:03.000Z    1  
     2020-09-15T23:53:57.000Z    1  
     2020-09-16T00:11:13.000Z    1  
     2020-09-16T00:33:24.000Z    1  
     2020-09-16T00:33:57.000Z    1  
     2020-09-16T00:43:23.000Z    1  
     2020-09-16T01:07:12.000Z    1  
     2020-09-16T03:53:39.000Z    1  
     2020-09-16T05:49:03.000Z    1  
     2020-09-16T09:07:29.000Z    1  
     2020-09-16T09:57:44.000Z    1  
     2020-09-16T11:23:51.000Z    1  
     2020-09-16T12:55:14.000Z    1  
     2020-09-16T13:18:06.000Z    1
```

2020-09-16T15:28:05.000Z	1
2023-12-15T19:32:02.000Z	1
2023-12-15T11:44:47.000Z	1
2023-12-15T14:26:45.000Z	1
2023-12-22T15:27:58.000Z	1
2023-12-15T11:02:48.000Z	1
2023-12-16T18:20:51.000Z	1
2023-12-25T13:34:39.000Z	1
2023-12-24T07:26:22.000Z	1
2023-12-15T11:10:31.000Z	1
2023-12-15T02:31:07.000Z	1
2023-12-15T02:03:06.000Z	1
2023-12-15T21:05:42.000Z	1
2023-12-14T21:06:38.000Z	1
2023-12-14T17:37:14.000Z	1
2023-12-14T17:19:36.000Z	1
2023-12-14T22:33:46.000Z	1
2023-12-15T07:25:17.000Z	1
2023-12-14T19:44:08.000Z	1
2023-12-14T22:14:03.000Z	1
2023-12-15T05:06:23.000Z	1
2023-12-14T22:58:57.000Z	1
2023-12-14T17:29:18.000Z	1
2023-12-14T20:33:40.000Z	1
2023-12-15T15:47:22.000Z	1
2023-12-15T07:54:52.000Z	1
2023-12-14T17:59:40.000Z	1
2023-12-15T03:23:16.000Z	1
2023-12-15T19:30:04.000Z	1
2023-12-15T13:52:43.000Z	1
2023-12-14T23:29:27.000Z	1
2023-12-15T16:43:54.000Z	1
2023-12-14T18:22:30.000Z	1
2023-12-14T19:54:36.000Z	1
2020-09-17T00:11:20.000Z	1
2020-09-17T12:47:25.000Z	1
2020-09-17T14:03:42.000Z	1
2020-09-18T04:03:50.000Z	1
2020-09-16T01:50:01.000Z	1
2020-09-16T13:49:40.000Z	1
2020-09-15T23:54:40.000Z	1
2020-09-16T01:01:41.000Z	1
2020-09-16T20:43:42.000Z	1
2020-09-15T21:32:15.000Z	1
2020-09-16T00:36:01.000Z	1
2020-09-15T22:21:06.000Z	1
2020-09-16T19:26:46.000Z	1

2020-09-16T15:16:27.000Z	1
2020-09-16T11:37:04.000Z	1
2020-09-16T01:56:05.000Z	1
2020-09-16T01:21:03.000Z	1
2020-09-16T18:20:23.000Z	1
2020-09-16T01:11:19.000Z	1
2020-09-16T01:00:17.000Z	1
2020-09-16T00:24:42.000Z	1
2020-09-17T17:39:29.000Z	1
2020-09-16T00:01:07.000Z	1
2020-09-16T04:58:35.000Z	1
2020-09-16T03:43:47.000Z	1
2020-09-15T23:27:03.000Z	1
2020-09-16T15:02:59.000Z	1
2020-09-16T22:30:20.000Z	1
2020-09-15T21:42:37.000Z	1
2020-09-16T06:08:13.000Z	1
2020-09-15T23:26:19.000Z	1
2020-09-15T22:30:24.000Z	1
2020-09-16T14:44:35.000Z	1
2020-09-17T16:07:57.000Z	1
2020-09-16T11:04:27.000Z	1
2020-09-15T21:57:11.000Z	1
2020-09-16T01:28:16.000Z	1
2020-09-20T17:38:28.000Z	1
2020-09-15T22:58:59.000Z	1
2020-09-15T22:35:10.000Z	1
2020-09-15T21:40:25.000Z	1
2020-09-15T22:33:20.000Z	1
2020-09-16T16:51:08.000Z	1
2020-09-16T00:57:31.000Z	1
2020-09-15T23:11:04.000Z	1
2020-09-15T22:58:07.000Z	1
2020-09-16T02:52:17.000Z	1
2020-09-16T22:15:41.000Z	1
2020-09-15T23:02:32.000Z	1
2020-09-16T05:24:28.000Z	1
2020-09-15T23:36:23.000Z	1
2020-09-16T03:48:18.000Z	1
2020-09-15T22:56:11.000Z	1
2020-09-16T01:43:27.000Z	1
2020-09-16T01:53:03.000Z	1
2020-09-16T00:55:14.000Z	1
2020-09-15T22:28:14.000Z	1
2020-09-16T04:27:15.000Z	1
2020-09-16T16:00:45.000Z	1
2020-09-15T22:57:42.000Z	1

2020-09-16T02:30:41.000Z	1
2020-09-16T10:05:08.000Z	1
2020-09-16T01:01:24.000Z	1
2020-09-16T12:55:51.000Z	1
2020-09-16T10:04:15.000Z	1
2023-12-15T19:04:09.000Z	1
2023-12-14T21:29:19.000Z	1
2022-09-08T14:51:13.000Z	1
2020-09-15T21:44:55.000Z	1
2020-09-15T21:52:54.000Z	1
2020-09-15T21:56:22.000Z	1
2020-09-15T21:59:55.000Z	1
2020-09-15T22:05:05.000Z	1
2020-09-15T22:05:10.000Z	1
2022-12-23T22:57:29.000Z	1
2022-12-28T09:50:43.000Z	1
2023-03-04T12:43:59.000Z	1
2023-01-06T17:20:49.000Z	1
2022-12-23T22:57:24.000Z	1
2022-12-25T08:20:00.000Z	1
2022-12-27T04:01:11.000Z	1
2023-01-06T19:05:40.000Z	1
2023-01-11T04:17:21.000Z	1
2022-12-23T02:33:48.000Z	1
2023-01-11T05:28:35.000Z	1
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2022-12-22T22:10:28.000Z	1
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Name: count, dtype: int64

```

```
[63]: df=nasa.drop(['date','commentsCount','profileName'],axis=1)
```

```
[65]: df
```

```

[65]:      likesCount      text
0          2  Neat comparison I have not heard it before.\n ...
1          0  An excellent way to visualise the invisible! T...
2          1  Does the CO2/ghg in the troposphere affect the...
3          4  excellent post! I defo feel the difference - o...
4         16  Yes, and carbon dioxide does not harm the Eart...
5          4  Excellent example...very relatable to the Gen ...
6         10  I am so proud of whoever created this content...
7          1  Has the Earth ever had a concentration of over...
8          0  Yes, and not even half a cup later that poor s...
9          4  Historical co2 data would make it an interesti...
10         6  why the northern hemisphere warm more than the...
11         1               So what are we gonna do about it?
12         3  Yes. I fall asleep on decaf and stay awake wit...
13        18  Plus you can literally measure the heat retent...
14         3  The two most abundant gases (nitrogen and oxyg...
15        14      That's an excellent way to illustrate 400 ppm.
16        40  I find it interesting when people claim that C...
17         1               Love this post! Great pedagogy

```


18 0 Kathy Schulz
 19 0 Before of after I drink it?
 20 0 That's a good analogy. \n\nI have thought that...
 21 0 Great advice!
 22 0 Thanks for sharing
 23 0 Excellent
 24 0 Not if its good coffee beans, \nNot until I ge...
 25 1
 26 0 *****
 27 0 Hlw
 28 0 decaf is like mouth to mouth were as caffeinat...
 29 4 Maybe this is what happened to Mars...we messe...
 30 1 It is not the average temperature that is impo...
 31 21 It's always fun watching dropouts pretend to a...
 32 19 Whenever NASA posts good, peer reviewed scienc...
 33 3 Due to more carbon
 34 3 Maybe if Fox had investigative journalists the...
 35 1 By 2050...12-18 inches as the rate continues to...
 36 2 You simply can't mess with science and the dat...
 37 5 Cue the science graduates of the universities ...
 38 3 That's horrendous
 39 0 Say bye bye, Florida.
 40 1 Sustainability VS Stability of climate change ...
 41 1 Dutchy Holland maybe you better move up a leve...
 42 12 Yet so many westerners don't believe or unders...
 43 0 Di pulau Jawa Indonesia sering gempa sekarang
 44 0 Andrew Bidi apropo de conversatia noastra, am ...
 45 0 The "greenhouse effect" is concerned with the ...
 46 0 No to plastic pollution
 47 19 I was born in 1960 and spend a lot of time out...
 48 2 We all have to move to the Sahara desert and u...
 49 0 So when did we start directly measure temperat...
 50 1
 51 2 Earth Sun Screen - We as Collaborative Earthli...
 52 1 This is what The CREATOR says about Climate ab...
 53 2 Awesome! Maybe I can start growing palm trees ...
 54 1 If climate action is also important to you, do...
 55 2 Please urge your political representatives to ...
 56 4 Republicans would rather boil the planet and d...
 57 2 Planet Earth is warming up fast. Hurricanes, ...
 58 5 Now they're aware.
 59 1 How can the heat of the planet be measured acc...
 60 4 I guess we need to do more to reduce CO2 emiss...
 61 2 NaN
 62 2 nothing to see here folks...move right along...
 63 1 I'm in disagreement with someone that says tha...
 64 9 We are speedrunning global ecosystem collapse.

65 1 NaN
66 0 NaN
67 1 Wonder what's causing these heat waves. And wh...
68 0 Joni Shepherd Silva Charles Silva
69 0 Genesis HC
70 0
71 0 CC? NO way to predict ACCURATELY!!
72 1 <https://m.youtube.com/watch?v=2XuAhOnWQh8&pp=y...>
73 0 Don't worry...the very uneducated oil sycophan...
74 1 <https://linkso.medium.com/why-the-latest-on-cl...>
75 0 Suzie A. Woodruff-Gray
76 0 NaN
77 0 NaN
78 1 Dear world, if there was ever a time for the w...
79 10 Thank you NASA Climate Change. Your patience ...
80 24 I miss my " old school America" where we turn...
81 18 Thank you Nasa for explaining the scientific e...
82 33 I'm amazed that we've been warned since the 70...
83 10 And in the last 20 years the variance is reduc...
84 0 The question is, how can we help? Each of us c...
85 9 Time to really do something different. Time to...
86 1 Only 140 years of data?? C'mon now! We've been...
87 0 I don't understand the graph, what does it all...
88 0 My question is to NASA. The air in a greenhouse...
89 0 Humans are not understanding life on earth bec...
90 0
91 0 we all on the same boat. i think if we didn't ...
92 1 omg. the slope of the blue line, then the yel...
93 1 Thank you NASA for continuing to highlight thi...
94 0 Sukhwinder Singh
95 0 I don't know much but I think humanity need's ...
96 5 As I understand it, even if we reduced emissio...
97 1 Anthropogenic global warming is one symptom of...
98 1 Someone forgot to mention to Florida that she ...
99 0 Hot!
100 1 I'd like to go back to 1880, please.
101 0 How has The Sun changed in 100 years ..is it ...
102 13 Climate change is a made up scenario from the ...
103 5 The deniers always with the same statements, a...
104 26 Taking a 140 years of temperature readings on ...
105 6 I havent seen any difference anywhere. Go ahe...
106 2 Why don't some people believe in science? I ju...
107 0 Remember the planet that we live on also went ...
108 0 Can we also get a data to the left of 1880?...
109 19 The difficulty in arguing science with a scien...
110 43 It's worth remembering that land surfaces (red...
111 9 The three eruptions from 1880 through 1920 dum...

112 0 I thought it's stock market chart with indicat...
 113 3 So in 140 years we have a temperature anomaly ...
 114 15 Scientific denial, are we coming to the Middle...
 115 0 Wow, cool! Or rather: not so cool!
 116 0 What caused the cooling after WW2?
 117 3 When are we going to do something?
 118 0 Y vamos pa'riba...
 119 0 From where we can download this data?
 120 1 I hope for the Best., but it's Still Hot., an...
 121 0 It is going to get very bad.
 122 22 We have also in the UK lost much of our sea gr...
 123 1 We need to do two things to ensure our species...
 124 3 Oh my. I think there needs to be more done tha...
 125 6 Its about to be a survival for the fittest, wh...
 126 110 I love watch NASA dunk on people who think the...
 127 4 If I were a gambling man I'd look at the patte...
 128 18 " Where do you think September 2021 will be? ...
 129 1 Lies compare the actual recorded temps to this...
 130 8 Are these the same 'Scientist' that claimed we...
 131 0 Can you show the correlation of earth temperat...
 132 0 Our magnetic north has moved 30 miles a year s...
 133 0 Are you looking at sunspot data since they hav...
 134 0 Need to spread your data out. Not saying we as...
 135 2 Why do Climate Change scientists never show up...
 136 2 We have Billions of asphalt on earth. World is...
 137 0 What causes the earths core to increase? And h...
 138 0 Theory is Free all the Dammed Rivers in the wo...
 139 0 Do you not know that the axis has moved move t...
 140 1 What are you going to do about Mars. Mars is w...
 141 2 Here is the real story. It shows about 140,000...
 142 1 Isn't it disingenuous to show increase in temp...
 143 1 Why start in 1951? Go back at lest 1000 years ...
 144 0 Hi NASA can you explain to me why this year wo...
 145 2 No accountabilty for the fact our north pole h...
 146 9 I'm afraid NASA has been added to my list of a...
 147 16 NASA Climate Change Thanks for all the work an...
 148 2 It,s Called Fall
 149 1 Where are the graphs for the Roman Warm Period...
 150 0 Climate change is a political issue created by...
 151 2 Hasn't our climate been warming since the ice ...
 152 4 All this crap is based on false information so...
 153 0 What about 1936, very convenient to start at 1950
 154 2 The VAST majority of Earths history has been a...
 155 0 Has a lot to do with the sun,
 156 4 Wow, we are almost as warm as we were in the m...
 157 0 Can you continue back further in time, by what...
 158 3 We never had climate change till they strady s...

159 4 Anyone else think climate change is a natural ...
 160 1 Alright... so who caused the ice age?
 161 3 Moonlandings, climate change, covid, etc are h..
 162 0 Southern hemisphere?
 163 16 I remember in the 70's everything was about a ...
 164 2 Summers are getting hotter and winters are get..
 165 6 The Southern Hemisphere has gotten colder, wh..
 166 2 Is there a reason the change escalates so dras..
 167 2 How does one go about taking the earth's tempe..
 168 1 Why start at 1951?
 169 3 Oh, don't worry - \nprez said that soon it wil..
 170 5 Climate change is real
 171 10 Global warming , it's happened before , it's h..
 172 4 What was the reason for the dust bowl in the19..
 173 28 It's not all Climate change believe me there's..
 174 0 Link doesn't seem to be working, can you repost?
 175 15 "I dont think science knows!"
 176 16 The climate is changing but it's ridiculous to..
 177 3 Re ord being from 1860 something...lolol
 178 7 The sad thing is that if we look at projected ...
 179 0 Don't worry. It will start getting cooler now..
 180 0 Lower
 181 0 unfortunately
 182 0 Can we speak about a climate change based only..
 183 3 Okay Students...repeat after me truth NUCLEAR ...
 184 0 If Christians actually read their Bibles they ...
 185 1 One (1) degree C in 140 years...\n\n...got it
 186 11 That is only 150 years of data. Periods of glo..
 187 6 Excellent reports by NASA. Too bad be are liv..
 188 1 Dalton Van Stratten this is interesting!
 189 6 NASA climate, thank you
 190 0 Andy Welborn
 191 3 Our Planet is Hotter!!!\nAnd Climate Change is..
 192 0
 193 1 We are still at the tail end of an ice age. \n..
 194 10 Earth goes through these cycles every so often..
 195 0 So, what you're say is we need more volcanic e..
 196 0 Thank you for posting..and replying to the idi..
 197 2 My understanding is that you don't account for..
 198 1 How much do this contribute to the sea level r..
 199 1 Let's see an eon of comparison...this short a sa..
 200 0 115 Times More Than Man\n\nhttps://scitechdail..
 201 1 Think how to neutralize the global warming?
 202 6 Quit chopping down all the forest maybe that m..
 203 0 Meziah Jolley what money, exactly?
 204 37 Blah blah blah. There is nothing man can do to..
 205 1 The 'die back' Is going to be horrendous.

206 0 .98 Lowest smoothing
 207 2 I'm STILL waiting for that Next Ice Age scare ...
 208 0 sad that its just a matter of time now.
 209 9 Denying human involvement in climate change do...
 210 0 Oh dear
 211 0 Ruth Crawl Frank Bulbeck. Wow..
 212 0 Thats correct. There is a pattern also that al...
 213 54 I'm kinda surprised that the trolls blaming "E...
 214 6 Hey NASA any chance you could give us your ann...
 215 4 A really good analogy of the effect of CO2 in ...
 216 13 What confuses me is if this coat is getting "p...
 217 4 How can we stop increasing the amount of CO2?
 218 0 Question to NASA. How do you calculate these a...
 219 0 How to drink water . How to observe.maybe .
 220 1 In 1750 how were they able to know the CO2 in ...
 221 3 In terms raw CO2 ppm, the difference between n...
 222 2 You know how people say "The Earth's climate h...
 223 1 I think the emission of greenhouse gases will ...
 224 0 By 'people' hope they refer to the BIG GREEDY ...
 225 1 Great metaphor
 226 0 Excellent analogy
 227 0 I love, and hate how NASA needs to use a 1st g...
 228 0 Actually with current pledges in emission redu...
 229 0 I hope that each country should be reminded of...
 230 1 NASA Climate Change Is it not a bad idea to st...
 231 2 People co-evolved with other organisms like fu...
 232 1 Are you similarly confused by the all-time rec...
 233 0 thank's of Philosophy share knowledge..., Part...
 234 0 In the 70s we had fuel restrictions, general s...
 235 0 Sadly
 236 1 James Procak because the expanding heat allows...
 237 1 Manuel Edgardo Lugo Recart
 238 0 NaN
 239 0 We need fast and urgent funding to deal with t...
 240 0 Brody Smith
 241 0 Jim Vb
 242 1 #ClimateChange #JPL #Anthropocene\n[https://ww...
 243 4 Mean while we continue to destroy the natural ...
 244 1 Taking advantage of the naive. Climate has bee...
 245 2 Your predictions are based on FAKED computer p...
 246 0 This earth has been changing since its concep...
 247 1 Exactly how long have they been keeping record...
 248 1 If the greenhouse gas carbon dioxide is gettin...
 249 11 Cut the crap. In the 70's the so-called expert...
 250 0 Time has already long-run out to make any diff...
 251 1 Temperatures rising are from rising magma, tha...
 252 1 BS, the democrats are behind this, 1 volcano c...

253 1 Can you show us a 100,000 year graph? Can you ...
 254 2 Climate change is and always has been in full ...
 255 27 I wish this was simply old news and we had peo...
 256 22 Is there anyone in NASA that can explain clima...
 257 18 Thank you to all of you at NASA Climate Change...
 258 6 The current ruling class, who has control over...
 259 12 Most of the disasters that you talked about. I...
 260 5 Wow! Well, I suppose the ultimate expert on GW...
 261 4 The fastest way to reduce car emissions is to ...
 262 4 To keeping our families. Together and work on ...
 263 3 These people in the comment section who haven'...
 264 6 The data is there, scientific information is t...
 265 2 Plant more trees stop building malls build in ...
 266 1 Changes to our climate are from our magnetic f...
 267 1 Natural disasters. Hard to security? I wish th...
 268 1 Global warming seems to be accelerating.
 269 1 Glaciers are melting, sea levels are rising, ...
 270 3 It's as close to you as Air.. We must go to So...
 271 1 But it seems to me that wildfires does not hap...
 272 0 I am a outdoors man in baltimore for 53 year's...
 273 1 All this is the real truth but only our presid...
 274 0 All I can say about all these changes----- I k...
 275 2 We need to combat climate change so that the p...
 276 0 The academic consultants to IPCC (Internationa...
 277 0 There are many factors involved and I am not g...
 278 0 Best Aug we ever had here? But maybe a protes...
 279 1 What's this, like the 19th hottest year on rec...
 280 0 What happened between the 20's and 40's? What ...
 281 0 Please send this informative article to our sc...
 282 0 That is going to give Wyoming a wonderful year...
 283 0 The reason to all this happened because our pl...
 284 0 There are lots of new things happening in our ...
 285 0 The hottest decade was the 1930's, and still i...
 286 4 We all play a part...as a world we need to do...
 287 0 NaN
 288 0 Did you know that climate records only reliabl...
 289 0 Northern hemisphere summer
 290 0 Pensé que estaba sola en el tema de salvar el ...
 291 0 Pois e preocupantemas acreditem no actual pres...
 292 0 What would happen if we had Global Cooling????
 293 3 The comments on this post are terrifying, didn...
 294 0 1 degree change? Am I reading this right?
 295 0 Great Science!! Hard to deny!
 296 2 The comments are a fun read. Entertained by th...
 297 0 Lokepasa ke usa tiran mucho plástico y eso est...
 298 0 quick search says change by 1.5° C is 2.7° cha...
 299 0 Oh my ... climate change effects us all

300 1 Humans we are terrible to our planet.
 301 1 Donald Trump; Does Not Believe In Global Warmi...
 302 2 So glad NASA doesn't let the trolls and denial...
 303 2 Its crazy how people negate science like this...
 304 4 I wrote a very researched term paper in 1999 o...
 305 0 Es triste todo lo que esta pasando todo se des...
 306 1 Do not agree with climate change
 307 0 More love , tu ecologic tying positive, bendy...
 308 0 The earth does have a 1/2 life.
 309 1 Save the planet
 310 0 Gracias ami tambien me da mucha tristeza Como ...
 311 0 Yes thank you were dead in November
 312 1 Ivy Pantel-LaForge\n\nThe comments on this pos...
 313 0 move to south pole
 314 0 Its to late check mate
 315 1 Pues ay que aser algo para salvar nuestro plan...
 316 8 After all these decades protecting and informi...
 317 1 It was "global warming" until science noticed ...
 318 1 \nNASA wants you to believe that man is the so...
 319 0 NaN
 320 11 Also people are forgetting about the delay fac...
 321 2 I'm in southern Ontario Canada and we are bla...
 322 0 NaN
 323 0 Bruce Threlfall
 324 0 In deed.
 325 0 Hello PEOPLE its Happening in our Lifetime
 326 0 INTERESTING
 327 0 Ya it's going to happen
 328 0 Soooooo
 329 0 .
 330 0 Thanks
 331 0 NaN
 332 1 Dont agree
 333 0 NaN
 334 0 We are the
 335 0 Among other things too !
 336 0 NaN
 337 0 Wake up people's!!!!
 338 0 NaN
 339 0 Fake.
 340 0 NaN
 341 0 NaN
 342 3 Vote
 343 0 Msfloodprevention.com\nSave lives and land
 344 28 I can't help but notice the hot spots on the w...
 345 12 This is becoming a trend, for those that are n...
 346 0 Good game forfeit at 2024

347 0 does the solar maximum affect \nthe earth's co...
 348 24 Ok but what about like the 5 billion years bef...
 349 20 So much denial propaganda from those who don't...
 350 0 Not every day of course, but we've been having...
 351 9 Caused by human activities is the biggest lie...
 352 3 And the denialists and conspiracists show up e...
 353 10 Our government promotes fear for funding, if y...
 354 14 One thing is common among climate change denie...
 355 3 If you can't give me a basic description about...
 356 17 From another site\n\nThe climate change hoax h...
 357 5 and the solar flare high activity has nothing ...
 358 6 I love this weather couldn't have a better win...
 359 7 That normal because we are entering 12000 cycl...
 360 0 We forgot a huge informations about climatic c...
 361 1 I thought we are having an El Niño
 362 4 John Kerry to the rescue with his private jet.
 363 6 This is what happens when politicians are in c...
 364 18 NASA is a reliable source ; I really dont unde...
 365 0 La tendencia del calentamiento se mantiene, ge...
 366 1 I wonder if over population has anything to do...
 367 1 Did the Canadian wilfires have an effect?
 368 0 Vielleicht ist ja die Nordhalbkugel zZ etwas m...
 369 0 My friend Ben Ben thinks climate change is a h...
 370 4 What agenda is NASA pushing now?
 371 6 Joe has it all figured out how to fix it.
 372 34 Everyone knows what's going to happen, why it'...
 373 0 oooooohot....oooooobad
 374 0 NaN
 375 0 And?..
 376 0 Move the thermometer back to where it was then...
 377 0 What is the reason of this global augmentation...
 378 0 After Human extinction, carbon in the atmosphe...
 379 21 November and December has been the coldest eve...
 380 4 Back in the 90s, we used to wear sweaters on c...
 381 2 Edward Motzi This sounds like you:
 382 0 ,there's still plenty of flat earthers around.
 383 2 It's all happened before.
 384 0 Y cada año será más caliente
 385 0
 386 0 There is no time
 387 0 Heavy rain Heiker Mendozaa
 388 3 NaN
 389 3 Bs
 390 0 At a rate of 10-20 breaths per minute, join th...
 391 0 These turd stains think it's funny.
 392 1 Fake garbage nasa lies
 393 1 BS.

394 3 AGW is not linear.
 395 24 Cue The deniers screaming over this being fak...
 396 4 Note that the climb really starts in 1980 - ex...
 397 120 You are being gas-lighted. Have any of you hea...
 398 4 To me it's just amazing to see how locked in t...
 399 3 That's one scary "Graph" Costume
 400 0 NASA Climate Change Can you post graphics of i...
 401 1 Yep! I remember cooler Halloweens!
 402 0 When will we all agree to just stop burning st...
 403 0 As soon as possible we should change our lifes...
 404 1 I wish if I shared this I could also share all...
 405 0 Erin Haas Brassil check out the Anoka referenc...
 406 0 Scary!
 407 3 Our planet, and especially Earth's ecosystems,...
 408 34 Here is what you need to know about Climate Ch...
 409 0 What do we do? Congress is negotiating away p...
 410 1 A good visual representation of those memories...
 411 0 Jusst Jess
 412 0 Carbon increases, oxygen decreases.\n\nIs ther...
 413 0 The industrial revolution was the beginning of...
 414 3 Woah, NASA had the scariest Halloween post I've...
 415 2 NASA Climate Change can surely drop the mic no...
 416 5 At about 8243 B.P., there was a 3C rise in glo...
 417 2 I am not blaming or deamonizing industrializatio...
 418 5 Give up NASA, internet has liberated its "Goog...
 419 1 Fact !! During the 1950s houses built in miami...
 420 19 Thanks for defining 'anomaly' in this context...
 421 0 The Mother Earth is in sorrow. Can we do somet...
 422 3 The evidence screams that we're on a collision...
 423 0 If it is a recurring cycle; why don't we plan ...
 424 0 So depressing
 425 15 "Do you remember the famous 97% study - that 9...
 426 37 As Elizabeth Kolbert said in her book, "The Si...
 427 62 Too bad we don't see Oct 1821 or 1721, just ke...
 428 9 Scary! This is a great graphic to remind every...
 429 1 Wow! 100 years this year! I didn't know that.
 430 0 Jimmy Valmer
 431 0 You are a big liar.\nThe Earth is Flat.\nThe W...
 432 1 Small consolation, but it'll be in the high 60...
 433 126 I can only hope to someday attain the level of...
 434 7 Great post NASA Climate Change. No doubt the f...
 435 17 Weather is not climate! Climate allows extreme...
 436 8 It's amazing that well educated people I know ...
 437 43 thank you for the research you do, and for sti...
 438 0 Perhaps there are new lives being born who wil...
 439 0 It's been getting warmer ever since the end of...
 440 0 What PPM were the CO2 levels in atmosphere abo...

441 10 Do you have another graph for before 1880?I li...
 442 38 The deniers don't realize that it may be 20 de...
 443 28 NASA Climate Change how well were climate stat...
 444 0 Temperature increase was constantly rising up ...
 445 1 please...NASA Climate Change ...\n ...
 446 0
 447 0 How at some stages like 1900 to 1920 temperatu...
 448 0
 449 0 The next time you're sitting in bumper to bump...
 450 55 To those who cite a very cold day as evidence ...
 451 0 In our area of the country (Pa) a lot of the s...
 452 0 politicians keep your hands off our scientists...
 453 3 Funny how every winter after a big blizzard, t...
 454 0 Men argue. Nature acts.
 455 0 Never seen loess spelled that way. Must be Ame...
 456 1 Despite amazing scientific research, not a sin...
 457 1 How can we bring students who are lacking skil...
 458 0 You've wrong. It's been warming since the last...
 459 0 Wow, crazy stats.
 460 0 How anyone can think we have had no impact on ...
 461 0 Subir un Grado es demasiado!
 462 0 So if people are the cause, how do you explain...
 463 1 Weather is like the clothes you wear on a part...
 464 0 Pourquoi prendre le mois de décembre ? Ok c'es...
 465 0 Nous accélérons toujours depuis 1990
 466 0 Just because NASA can't say #HumanCausedGlobal...
 467 1 Started with the Industrial Age, 1880's - and ...
 468 0 For you deniers I'm just going to say this in ...
 469 0 So many Muppets trying to argue with scientist...
 470 0 I'll bet they were talking about a global cool...
 471 0 <https://www.barnesandnoble.com/w/the-great-cli...>
 472 0 All fake numbers again
 473 4 Many people do not understand some very basic ...
 474 0 You people are absolutely nuts
 475 0 The "greenhouse effect" is concerned with the ...
 476 0 Is CO2 Earth's Thermostat?\nCarbon dioxide has...
 477 0 <https://www.facebook.com/reel/3246160055626064/>
 478 0
 479 0 Kevin Lay
 480 0 Look at this phone case \nbit.ly/3XmDT8c\nWhat...
 481 0 emen
 482 0 'Fact'['V-x'[['']]Ray]'y[2'] ' ' '
 483 1 This is our fault
 484 0 You show em!
 485 4 NaN
 486 0 Iqbal Badruddin
 487 0 A very real concern !!!!

```

488         0                Someone send this to tRump !!!
489         0                Anneliese Garcia
490         0 Just like our government denies that there is ...
491         2 Some people want to leave Mother Earth and col...
492        15 Imagine working at NASA after a life of study ...
493        13 Yes, but, the U.S. mean temperature anomaly , ...
494         3         Oh well at least it's not 1.5c, just 1.44.
495        16 "The 1.5'C Paris Agreement red line is dead an...
496         1 I presume this 'burst' of heat is El Nino rela...
497        13 My fear is keep crying wolf and when the wolf ...
498         2 A cause de l'activité humaine .....’ et pourtant ...
499        13 And this is going to be hottest December on th...
500         0 A terra não tem 100 anos, nem 1 milhão de anos...
501        11 In my opinion, there is no such thing as a phy...
502        46 Waiting for the science illiterates to come te...
503        32 Gosh if only people had been warning about lit...
504         2 Deniers simply do not care. I fear us humans h...
505         3                second order trends too.
506         0 And the destabilization of the polar vortex is...
507         1 The clue is in the adjective "global" . There...
508         3 The world's population has been increasing too...
509         0 Definitely not the case. The last snowy Christ...
510         0                The only solution is back to nature.
511         3 Then don't use some very hot days in the summe...
512         0 Also climate change involves severe weather of...
513         0 With cold temperatures, ignoring change in alb...
514         1 Thank you.\nDo you happen to have a global tem...
515         0 "Ice On Fire" documentary presents a through e...
516         6 Deniers will continue to be deniers because th...
517         0                One can only hope for a peak
518         1 what is the error margin for the temperature e...
519         3 We all should volenteerly help in reducing Glo...
520         1                Sergio Yepes
521        12 We're experiencing severe, abnormal weather pa...

```

```
[67]: df.head(15)
```

```

[67]:      likesCount      text
0         2  Neat comparison I have not heard it before.\n ...
1         0  An excellent way to visualise the invisible! T...
2         1  Does the CO2/ghg in the troposphere affect the...
3         4  excellent post! I defo feel the difference - o...
4        16  Yes, and carbon dioxide does not harm the Eart...
5         4  Excellent example...very relatable to the Gen ...
6        10  I am so proud of whoever created this content...
7         1  Has the Earth ever had a concentration of over...
8         0  Yes, and not even half a cup later that poor s...

```

```

9           4 Historical co2 data would make it an interesti...
10          6 why the northern hemisphere warm more than the...
11          1           So what are we gonna do about it?
12          3 Yes. I fall asleep on decaf and stay awake wit...
13          18 Plus you can literally measure the heat retent...
14          3 The two most abundant gases (nitrogen and oxyg..

```

```
[69]: df['text'].value_counts()
```

```
[69]: text
```

The "greenhouse effect" is concerned with the infrared radiation given off by the earth. The sun's radiation basically passes through the oxygen and nitrogen in the earth's atmosphere and lands on the earth's surface, where 70% of it is absorbed; 30% is reflected back into the atmosphere. Part of this radiation bounces off the greenhouse gases and returns to be absorbed by earth. The greenhouses gases (GHGs) are water vapor (H2O), carbon dioxide (CO2), nitrous oxide (NO2) and methane (CH4).\n\nHow long does CO2 remain in the atmosphere? This is a difficult question because there are several processes that remove carbon dioxide from the atmosphere. From 65% to 80% of the CO2 that is released into the air dissolves into the ocean over a period of 50-200 years. The rest is removed over several hundred thousand years. According to the IPCC Fourth Assessment Report, about 50% of CO2 increase will be removed from the atmosphere within 30 years, another 30% will be removed within a few centuries and the remaining 20% may stay in the atmosphere for thousands of years. This means that if we could stop carbon dioxide emissions tomorrow, the carbon dioxide in the atmosphere would continue to warm the climate for thousands of years. Methane (CH4), by contrast, persists for about 12 years. Thus, even though methane is 26 times more potent than carbon dioxide, its effect is relatively short-lived. Furthermore, methane has increased from 700 ppb in 1750 to 1893 ppb today; notice that is parts per billion, not parts per million.\n\nIf the emissions of carbon dioxide into the atmosphere are causing global warming, how much will the earth warm up by the year 2100? This depends upon how many billions of tons of carbon dioxide are being emitted into the atmosphere. As a general rule, about 1 trillion tons of additional carbon dioxide in the atmosphere (actually 975 billion) will translate to about 125 ppm of additional carbon dioxide. Also, 125 ppm of additional carbon dioxide translates to about 1.8 °F (1 °C) in global warming. This can be verified by the fact that pre-industrial carbon dioxide was about 280 ppm and is now about 405 ppm. During this period, the planet warmed up about 1 °C.\n\nScientists have measured the amount of atmospheric carbon dioxide which corresponds to 1 ppm and have found that this corresponds to 7.8 billion metric tons of CO2 in the atmosphere. Therefore, in order to increase the global temperature by 1 °C, you would need 125 x 7.8 billion or 975 billion metric tons of carbon dioxide. A metric ton equals 1,000 kilograms (or 2.2 x 1,000 = 2,200 pounds); the U.S. is the only country in the world that does not use the metric ton. In 2016, the world pumped 36.1 billion metric tons (or 39.8 U.S. Gt) of carbon dioxide into the atmosphere. The average per capita emission of carbon dioxide is 7 metric tons per person per year. In the year 2100, there will be

about 11 billion people. Therefore, in 2100, in a business-as-usual scenario, we can expect the world to emit 11 x 7 or 77 billion metric tons into the atmosphere per year or an average of 56.5 billion tons for the next 80 years, i.e., an accumulation of 4.52 trillion tons of CO₂ by 2300. Less 25% (1.13 Tt) due to carbon sinks (the oceans are almost saturated with CO₂), the world will have an accumulation of 3.4Tt (4.52 - 1.13) of carbon in the atmosphere. Dividing 3.4 trillion tons of CO₂ by 975 million = 3.48 °C (6.26 °F). This means that the world will be 6.26 °F warmer in 2100 than it was in 2020.

The rise in sea level comes from two distinct processes: water expansions (3.3 feet) due to the added 6.26 °F of increased temperature and melting ice, mainly from Greenland (.41 feet) and the Antarctica (.2 feet) or 3.91 total feet by 2100, as well as increased extraction of groundwater due to irrigation. Although we do not usually notice it, water expands very slightly as it gets warmer. The second and potentially greater contribution to rising sea level comes from the melting of glacial ice. Antarctica has 90% of the ice, Greenland has 9% of the ice (2,931 trillion tons of ice) and the remaining 1% is tied up in continental glaciers, which except for the Himalayas will all melt by 2100. If Greenland completely melts, it will raise the sea level by about 24 feet (7.2 meters). If the Antarctica completely melts, it will add 200 feet (or 60 meters) to the sea level rise.

In the year 2100, I predict that fossil fuels will be almost depleted (coal may last until 2150) and that the temperature rise will level off. My model predicts that Greenland will be losing about 500 Gt of ice per year until the end of the century, resulting in about 0.41 feet of sea level rise by 2100. In addition, the Antarctica will add another 0.2 feet of sea level rise. Adding this to the 3.3 feet for thermal warming results in a sea level rise of 3.9 feet. Now add 2 feet due to melting of the West Antarctic Ice Sheet (WAIS) due to the collapse of the Pine Island and Thwaites glaciers and you have a 5.9 foot sea level rise by the end of the century. NOAA (the National Oceanic and Atmospheric Administration) states that the oceans could rise 8 feet by 2100 under a worse-case scenario, namely a complete collapse of the WAIS.

What effect would a 5.9 foot sea level rise have on the U.S.? Miami is one of the most vulnerable places to rising seas. About 2 million Americans would see their homes permanently flooded if sea levels rise just 3 feet. If the sea level rises 6 feet, 6 million Americans would see their homes permanently flooded. A new study predicts that as many as 13.1 million Americans in coastal areas will have to relocate by 2100 if the sea level rises 5.9 feet (1.8 meters), which is what I expect to be the most likely scenario.

In addition to sea-level rise, global warming is contributing to increases in the spread of insect-borne illnesses and crop-damaging pests. For example, diseases such as Zika, dengue fever and chikungunya are transmitted by mosquitoes, which pick up these diseases by biting infected people and then spreading them to other people through subsequent bites. Research has shown that warmer temperatures shorten the incubation period, which means the disease can spread more rapidly. Warmer temperatures also tend to increase the geographic range of insects.

Global warming also translates into more extreme weather events because higher temperatures mean an increase in energy in the atmosphere and oceans; energy is what drives weather. While we cannot attribute any particular

storm to global warming, we can tie an overall trend to global warming. It makes logical sense that warm ocean waters give birth to more intense weather. Generally, hurricanes cannot survive for long over sea surfaces that are cooler than about 79 °F (26 °C). The longer the ocean waters stay above 79 °F, the more opportunity there is for a hurricane to blossom.\n\nLastly, global warming will result in more droughts, floods and water scarcity. Demand for water has tripled during the past 50 years. Currently a half billion people live in a water-stressed country. By 2025, that number is expected to increase to about 3 billion. The vast majority of fresh water, about 70%, is used for agriculture. On the U.S. East Coast, much of the water supply comes from surface water, whereas most of the Midwest gets its water supply from a combination of surface waters and well water. The well water comes from underground aquifers such as the Ogallala Aquifer. At present rates of withdrawal, parts of the Ogallala Aquifer water will be available for irrigation for only another 10 to 20 years.

2

Neat comparison I have not heard it before.\n I would say that CO2 is like a disco ball so energy and collide with countless molecules as it bounces around in our atmosphere.

1

Good game forfeit at 2024

1

I love this weather couldn't have a better winter unless it was 70 would love that too

1

and the solar flare high activity has nothing to do with the higher November temperatures? interesting..\n\nThe only human activity to cause huge impact on the planet and change was Nuclear testing and Hydrogen bomb's that have been hugely used and tested in the past but zero accountability by Governments of the world, Cfc's were the blame towards the hole in the Ozone but interestingly Nuclear testing in the most sensitive layers of the Atmosphere have happened with Nuclear testing in the Stratosphere. It's all a huge sham with lack of accountability by the real parties responsible!

1

From another site\n\nThe climate change hoax has collapsed. A devastating series of research papers has just been published, revealing that human activity can account for no more than a .01°C rise in global temperatures, meaning that all the human activity targeted by radical climate change alarmists - combustion engines, airplane flights, diesel tractors - has virtually no measurable impact on the temperature of the planet.\n\nFinnish scientists spearheaded the research, releasing a paper entitled, "No Experimental Evidence for the Significant Anthropogenic Climate Change."\n\nThis is further supported by researchers at Kobe University in Japan who published a nearly simultaneous paper that reveals how changes in our planet's magnetic field govern the intensity of solar radiation that reaches the lower atmosphere, causing cloud formation that alters global temperatures. hat study, published in Nature, is called, "Intensified East Asian winter monsoon during the last geomagnetic reversal transition."

1

If you can't give me a basic description about the laws of thermodynamics in closed systems, nothing crazy...just a general overview of each of the laws and how they apply to earths systems....just off the top of your head.\n\nI will not listen to you about your opinion on climate change.\nThese self proclaimed critical thinkers that think they understand the complexities that is climate change crack me up

1

One thing is common among climate change deniers, low intelligence. Seen clearly in this comment section.

1

Our government promotes fear for funding, if your young, live your lives free of this nonsense....

1

And the denialists and conspiracists show up every time.

1

Caused by human activities is the biggest lie. Get outta here NASA climate change.

1

Not every day of course, but we've been having really beautiful summer days here in Ventura County this December.

1

So much denial propaganda from those who don't understand basic science...\n\nThey are part of the threat to life through their ignorance and selfishness...

1

Ok but what about like the 5 billion years before that? I'm sure there's been times when it was even hotter or even colder. Stop twist things to fit the narrative.

1

does the solar maximum affect \nthe earth's core in any way -\nor just the atmosphere & weather

1

This is becoming a trend, for those that are not paying attention

1

We forgot a huge informations about climatic changment, the time it take to do à full Day. \n\nThis is the most important informations that need to be added to all calculation as it easy to understand that climat change are 100% normal... if you put a chicken to heat at 200f for 18h or put 200f 12h what the change in the condition of the Meat ? They did not receive the same heat période, well same as earth does heat more in time now then climate getting burn more long in time

1

I can't help but notice the hot spots on the world map are where there are not very many thermometers. Isn't this world-wide temperature map generated by models that fill in the areas without data?

1

Msfloodprevention.com\nSave lives and land

1
Vote
1
Fake.
1
Wake up people's!!!!
1
Among other things too !
1
We are the
1
Dont agree
1
Thanks
1
.
1
Sooooooo
1
Ya it's going to happen
1
INTERESTING
1
That normal because we are entering 12000 cycle. It happened before, mammoths
extinguished så, neanderthals, Atlantis, Ice age, Great flood,... Men they all
had healthy ocean som cooled down the planet and helped that few thousand people
survived. Not we. From december 2024 we will be unable to stop changes and
protect ourselves.
1
I thought we are having an El Niño
1
In deed.
1
After Human extinction, carbon in the atmosphere will vanish and the Earth will
return to whatever climate trends would have happened without us.
1
Fake garbage nasa lies
1
These turd stains think it's funny.
1
At a rate of 10-20 breaths per minute, join the Indoor Air Quality movement.
Stay informed with alerts, guiding you to leave areas with air pollution that
may pose health risks over time.
\n#InflationReductionAction\n#EnergyReductionAction
1
Bs
1

Heavy rain Heiker Mendozaa

1

There is no time

1

1

Y cada año será más caliente

1

It's all happened before.

1

,there's still plenty of flat earthers around.

1

Edward Motzi This sounds like you:

1

Back in the 90s, we used to wear sweaters on christmas here in Honduras.\nNow its so hot we need to be inside a room with AC.\n\nThe world has changed... \nIt can get over 110F over here. Something unprecedented in the 90s.

1

November and December has been the coldest ever in Sweden. We had snow since middle of November and getting -10°C

1

What is the reason of this global augmentation of temperature?

1

John Kerry to the rescue with his private jet.

1

Move the thermometer back to where it was then .. not on tarmac

1

And?..

1

ooooohot....oooooobad

1

Everyone knows what's going to happen, why it's happening, what to do and how to make a change yet we are moving faster towards the catastrophic future.

1

Joe has it all figured out how to fix it.

1

What agenda is NASA pushing now?

1

My friend Ben Ben thinks climate change is a hoax and thinks all the scientists who study it are corrupted by? Big climate? Dunno.

1

Vielleicht ist ja die Nordhalbkugel zZ etwas mehr der Sonne zugeneigt

1

Did the Canadian wildfires have an effect?

1

I wonder if over population has anything to do with this ?.

1

La tendencia del calentamiento se mantiene, genera incertidumbre y preocupación, superaremos la meta del 1.5 C. no hay duda.

1

NASA is a reliable source ; I really dont understand how people can be so ignorant...

1

This is what happens when politicians are in charge of climate policy instead of scientists.

1

Hello PEOPLE its Happening in our Lifetime

1

Bruce Threlfall

1

AGW is not linear.

1

All I can say about all these changes----- I know these things must happen--& we get to watch it happening--in a way if you understand-(as much as a human can) it's kinda interesting---knowng what's on the way

1

Did you know that climate records only reliably go back 150 years?

1

We all play a part...as a world we need to do better...

1

The hottest decade was the 1930's, and still is today. We've been cooling ever since.

1

There are lots of new things happening in our atmosphere that affect our daily climate activity we all must pay attention to the reality before us

1

The reason to all this happened because our planet is dying each one of us has to be one tree on this planet that's it will help everyone in the future special Future Kids more better oxygen because everything is happening is our fault because we do the mistake and then later we ask why

1

That is going to give Wyoming a wonderful year around climate but where are we going to put everyone who wants to move here?

1

Please send this informative article to our scientifically stunted President . If enough people would do that it may annoy him somewhat. of course there are reports that he can't read so it may do little to no good sending him anything

1

What happened between the 20's and 40's? What was introduced to cause the progression?

1

What's this, like the 19th hottest year on record in 20 years? How long will it take for people to learn?

1

Best Aug we ever had here? But maybe a protest of all those rich people's jets and extra large houses

1

There are many factors involved and I am not going to type a book. Yes, the planet it's natural changes, but since the industrial revolution, mankind's abuse has taken its toll

1

The academic consultants to IPCC (International Panel for Climate Change) with the UN infamously falsified the data deleting whole data sets.

1

We need to combat climate change so that the people and earth can survive \n

1

All this is the real truth but only our president dont beleived he is the one that have to support all this catástrofe with all the texes we paid he has to serve us not us we pay him to work for us country why we have to beg for help. Its not right.

1

I'm in southern Ontario Canada and we are blanketed by a haze of smoke from the West Coast this has never happened before

1

I am a outdoors man in baltimore for 53 year's and our baltimore oriole likes cool air and our winters are so mild now I never seen one in 15 years now because it's warmer here now they stayed north and didn't come back !

1

But it seems to me that wildfires does not happen everywhere, but california and few other places. So why is wildfire only limitd in few places?

1

It's as close to you as Air.. We must go to Solar power and eliminate Fossil Fuels or die from Viruses we thought we're extinct.. Only to find they were frozen in the Arctic

1

Glaciers are melting, sea levels are rising, cloud forests are dying, and wildlife is scrambling to keep pace. It has become clear that humans have caused most of the past century's warming ...

1

Global warming seems to be accelerating.

1

Natural disasters. Hard to security? I wish they get better.

1

Changes to our climate are from our magnetic field of our planet being affected, causing rising magma and increased earthquake and volcanic activity, not man made greenhouse gases, if we would quit deforestation we would have less Co2 as trees absorb greenhouse gases and give back oxygen, if you do the research you will find the fires that are starting in Western US are all by fault lines and volcanic fields

1

Plant more trees stop building malls build in old parts of cities save are land

redo old neighborhood a 100 acres is develop in ohio a day the gas and oil has cut down billions of trees in the past 10 years yes we can do other things

1

The data is there, scientific information is there however we at the mercy of a rich minority that will not stop at anything for profits!!!!

1

These people in the comment section who haven't dedicated their entire lives to science, and most likely get their "news" from YouTube, are trying to school NASA on how climate change works

1

To keeping our families. Together and work on helping to keep on building up what may come in a bad situation with our land. we can't stop this pandemic but if we stay together things can change.

1

The fastest way to reduce car emissions is to promote affordable housing near job places. Very few people are close enough to work to walk. Very few streets are safe for cyclists. In seeking affordable housing or in seeking job opportunities, a large number of people commute 30-60 minutes one way.

1

Wow! Well, I suppose the ultimate expert on GW is Mother Nature. Just saying I think she's trying to tell us something. No matter whose at fault or whether our changing weather patterns are cyclical maybe we ought to put out heads together and figure out the future of our planet for our kids and grandkids. Thanks

1

Northern hemisphere summer

1

Pensé que estaba sola en el tema de salvar el planeta ,yo lo estoy haciendo desde mi trabajo aunque no les guste a mi jefe yo evito utilizar hojas de papel para de esta manera ayudar al planeta que se quede sin menos árboles a las grandes industria esto no les importa ni a mi jefe tampoco pero a mí si menos escrito menos copia y así .no habrá deforestación y tendremos un aire limpio para respirar

1

Pois e preocupantemas acreditem no actual presidents que para ele(e tudo falso) como a pandemia cov19e as mentiras que da a nacao e no final tenta desculpar- se com covardia tentando sacudir a agua do capote

1

What would happen if we had Global Cooling????

1

Also people are forgetting about the delay factor when it comes to greenhouse gases. The warming we are experiencing today is from decades past. Like a pot of water on the stove it doesn't come to a boil immediately. I'm really nervous on how this planet is going to look in my 60s and 70s...If I make it that far

1

\nNASA wants you to believe that man is the sole reason temperature increases. to be sure their own graphs when a thinking cap is put on shows most of the increase is well before man's influence. They also promote wild sea level

increases, but again look at the sea level graph with your thinking cap on. Again the WILD rise was way before man was influencing anything here on earth. My point being carbon isn't poison man has flourished the most during the warm periods. Man isn't causing the flooding from rising seal levels that is natural, at most man can influence the speed of an occurrence. We need to find alternative energy sources because we need energy, cheap energy sources. Cheap energy saves lives on this earth, expensive energy kills people. We can prepare for changing climate but we cannot use energy we cannot afford to use. We need causes to save ourselves, for instance did you know the Big coastal cities most run by Democrats while telling you you need to pay the green shaman to make your weather better and safer for you, they are still dumping their poisons into the ocean because it is cheaper than disposing of them properly on land? Out of sight out of mind except you and I both know this is poisoning our oceans. While they tell us coral reefs dying are caused by your use of energy and that red tides are from a mysterious origin, they dump chemicals into our oceans without one acknowledgement of the damage this is doing! You know dumping in our oceans is wrong right? Where is the plastic coming from? Oh yeah straws which by the way are never found in the ocean are the cause not at all from their ocean dumped garbage starting to unravel. \n\nThink! Cheap energy and as important universal access to it is a human right, those that control our access to energy control us! Demand cheap energy to save Black Lives, demand ocean dumping STOP to save Black Lives!!!!!!!!!!!! \n\nStop the idiocy! \n\nWe can do this!\n

1

It was "global warming" until science noticed it wasn't. So the globalists switched to "Climate Change".

1

After all these decades protecting and informing Americans...thank you for your continued service and precision as the challenges of climate impacts arrive in full. May we all do better to mitigate, build resiliency, and use credible science in response. #NCA4 #SR15 #BuildBackBetter #SprintOnClimate

1

Pues ay que aser algo para salvar nuestro planeta tan ermoso que es y nolo cuidamos

1

Its to late check mate

1

move to south pole

1

Ivy Pantel-LaForge\n\nThe comments on this post made me physically ill

1

Yes thank you were dead in November

1

Gracias ami tambien me da mucha tristeza Como danamos nuestro planeta y sin aser nada por cuidar nuestra casa de todos amen

1

Save the planet

1

The earth does have a 1/2 life.

1

More love , tu ecologic tying positive, bendiciones ,.

1

Do not agree with climate change

1

Es triste todo lo que esta pasando todo se destruye por todas \nCompañías\nLuego no siembran nada de árboles yo\nEn mi casa\nTengo muchas sembrados\nMuchas bendiciones pueblo

1

I wrote a very researched term paper in 1999 of which my professor at UNO stated that he LEARNED SOMETHING. Titled "Global Warming and The Greenhouse Effect ", my Junior year. An A+ of course. I am a retired biology teacher. I have been having conversations with High School friends of then since 1975 about what is going to happen to our planet if we don't take care of it. There is so much more I voiced, ya'll already know .

1

Its crazy how people negate science like this. You can draw them a huge picture and show them evidence and they will still scream bullshit lol. They won't realize it until it's too late.

1

So glad NASA doesn't let the trolls and denialists go unchallenged!

1

Donald Trump; Does Not Believe In Global Warming! Let's Get A President; That Does! That Is Why The Climate; Is Going Ka - Put!

1

Humans we are terrible to our planet.

1

Oh my ... climate change effects us all

1

quick search says change by 1.5° C is 2.7° change in F, is that correct?

1

Lokepasa ke usa tiran mucho plástico y eso está echando a perder losdrenajes las aguas del mar y animales mueren por eso en México fas alatienda y llano tedan el mandado embolsa ya notaron eso

1

The comments are a fun read. Entertained by the planets dumbest science deniers on one thread.

1

Great Science!! Hard to deny!

1

1 degree change? Am I reading this right?

1

The comments on this post are terrifying, didn't realize the right thinks NASA is a hoax too. God help us

1

BS.

1

Cue The deniers screaming over this being fake news

1

The current ruling class, who has control over the global political-economy, has the power to continue the burning of fossil fuels or to build a sustainable energy infrastructure. They have the power to meet the needs of displaced peoples who's lives are destroyed by climate change, or leave them to die. \n\nA cursory look at even just our recent history of dealing with environmental disasters and displaced people (Katrina, Puerto Rico, these fires, the migrant 'crises' on the borders of Mexico, in the Mediterranean, etc) shows what decisions they will make. \n\nIt's not because they are uniquely evil people. It's because of the logic of capital. They have an incentive, a near obligation, to maintain growth, maintain their bottom line. \n\nTo fight climate change, we need to fight this apocalyptic class. As workers, people who every day reproduce the world around us, who have the power to change the world, we have the weapon of withholding our labor to force capital to bend to our will (which, I imagine, would include not allowing the world to burn, destroying all of our and our loved ones futures).\n\nOnly when we work together, organize in our neighborhoods, workplaces, etc, will we have the power to challenge the system that is killing us.\n\nJoin a union. Join a socialist organization. Fight back in the streets. Read Lenin (and anyone else you think could help arm you with theory). We have to take this seriously if we are to have a future at all.

1

You people are absolutely nuts

1

Anneliese Garcia

1

Someone send this to tRump !!!

1

A very real concern !!!!

1

Iqbal Badruddin

1

You show em!

1

This is our fault

1

'Fact'['V-x'[['']]Ray]'y[2'] ' ' ' ,

1

emen

1

Look at this phone case \nbit.ly/3XmDT8c\nWhat do you think?

1

Kevin Lay

1

,

1

<https://www.facebook.com/reel/3246160055626064/>

1

Is CO2 Earth's Thermostat?\nCarbon dioxide has little or nothing to do with global warming. CO2 Is currently traced at 400 ppm. That is one carbon-dioxide molecule for every 2500 parts of the atmosphere. Humans contribute only a scant 16 ppm, which is 4% of the total CO2 accumulated in a year. CO2 only holds heat for a few seconds, and there is not enough of it to drive climate change. It is thermodynamically impossible!\nAlso, bear in mind, that water vapor is the earth's most abundant and effective Greenhouse Gas. CO2 is only 5% of the earth's CHG. Water vapor is 95% of the earth's GHG and holds heat far longer than CO2.\nLastly, CO2 will increase only after temperatures rise (eg. El Nino) and oceans degas. Conversely, CO2 levels drop as temperatures cool. In other words, CO2 levels are influenced by heat or the lack thereof and therefore do not drive climate but follow climate.\nClearly, CO2 is actually a thermometer and not a thermostat!

1

Many people do not understand some very basic facts. Weather is not climate.

1

You've wrong. It's been warming since the last ice age 20k years ago. And guess what? There will be another ice age one day. It's a giant cycle.

1

All fake numbers again

1

<https://www.barnesandnoble.com/w/the-great-climate-change-debate-andy-may/1141019734>

1

I'll bet they were talking about a global cooling from 1880 - 1920!!!

1

So many Muppets trying to argue with scientists and satellite data hahaha

1

For you deniers I'm just going to say this in short ignorance isn't Bliss it just means you're ignorant honestly

1

Started with the Industrial Age, 1880's - and beyond. And never in our planets history, has there been such a rapid and steady increase of such significant warming, as there has been since the beginning of the industrial age. \n\nOne pandemic, which did not shut down the planet, but it drastically reduced the amount of carbon emissions drastically and noticeably. The positive effects of that slowed down activity, were dramatic and instant.\n\nWhy can't we just decide to have global 'slow downs' periodically.\nMaybe one month out of every year?

1

Just because NASA can't say #HumanCausedGlobalWarming doesn't mean the self-exonerating pseudonyms like "global warming" or "climate change" land the bullseye. Institutional denialism.

1

Nous accélérons toujours depuis 1990

1

Pourquoi prendre le mois de décembre ? Ok c'est l'hiver dans le nord mais c'est l'été dans le sud...

1

Weather is like the clothes you wear on a particular day.\nClimate is the contents of your wardrobe

1

So if people are the cause, how do you explain why we still aren't in the ice age...in fact if people cause climate change how do you explain any Ice age or recovery? \n... and since cold kills more people than warm, maybe a bit of global warming is a good thing...

1

Subir un Grado es demasiado!

1

How anyone can think we have had no impact on our environment is beyond ignorant.

1

Just like our government denies that there is global warming well it is an issue the other issue is they cut Federal funding for all parks throughout the United States several years ago they've never got their funding properly back that's why there are so many closed roads throughout our Forest industry where you can't even get access into these places they stop wood Gathering wood cutting and everything to save one f***** squirrel or a f***** out for Christ sakes open our lands back up that the people back in collect firewood and do what we got to do to keep this s*** from happening this gets our government's fault for cutting funding for a Forestry Department and this took place years ago and it never recuperated from it I have not forgotten

1

Some people want to leave Mother Earth and colonize other planet how about we take care of the one we've got first take her from there if we can't take care of Mother Earth how we supposed to take care of another planet this is my question Mother Nature is very angry right now and it's because of mankind and the way he treats her it's time to wake up before it's too late I pray it's not too late already

1

Imagine working at NASA after a life of study and having to spend your days reading Jeff explaining you, from his baptism degree, that tHe CliMate aLwAys cHaNgEd.\nAnd still answer calmly. That goes beyond patience, is sanctity.

1

Yes, but, the U.S. mean temperature anomaly , while up a bit in November, appears from NOAA stats to be declining steadily for last 10 years. This map also appears to show that warmer temperatures are recently being distributed more equitably. Why should Florida and California have all the warm weather and not the Arctic?

1

Sergio Yepes

1

We all should volenteerly help in reducing Globall warming

1

what is the error margin for the temperature estimations from 200 years ago?

1

One can only hope for a peak

1

Deniers will continue to be deniers because they lack the ability to process scientific data that's different from what they believe are the facts!

1

"Ice On Fire" documentary presents a through explanation of the cyclical extremes results from Global Warming

1

Thank you.\nDo you happen to have a global temperature graph for the last ~10,000 years?

1

With cold temperatures, ignoring change in albedo, the earth is heating up faster because the radiation out to space is less. The incoming radiation at the top of the atmosphere is the same with or without the cold.

1

Also climate change involves severe weather of all kinds.

1

Then don't use some very hot days in the summer as an evidence it's getting warmer

1

The only solution is back to nature.

1

Definitely not the case. The last snowy Christmas here was some 10-11 years ago.

1

The world's population has been increasing too. It's an exponential curve. So more people around to make a mess of things ...

1

The clue is in the adjective "global" . There is always spatial (and therefore local) variation in cold and warm , but overall, the global trend over years is * unequivocally* upwards.

1

And the destabilization of the polar vortex is probably due to global warming. Loss of sea ice causes warming in higher latitudes, causing the polar vortex to dip into lower latitudes

1

second order trends too.

1

Deniers simply do not care. I fear us humans have done irreparable damage to earth, and that our arrogance, indifference and greed are going to perpetuate more of it.

1

Gosh if only people had been warning about literally this exact scenario for... I dunno... 50+ years.

1

Waiting for the science illiterates to come tell us how it's all a scam. Because math and chemistry eludes them.

1

In my opinion, there is no such thing as a physical global temperature. Secondly, NASA is involved in ranking years based on global temperatures that are made up different datasets for each year. In my opinion, this ranking is not credible because the dataset input are not the same year after year.

1

A terra não tem 100 anos, nem 1 milhão de anos, o nosso planeta tem 4,5 mil milhões de anos. Há 635 milhões de anos, durante um recuo sem precedentes dos glaciares indica que as temperaturas aumentaram significativamente perto do final do Neoproterozóico, atingindo uma média global superior a 32°, quando a média global de hoje é inferior a 15,5°. Ao reconstruir as temperaturas do Éon Fanerozóico, ou aproximadamente no último meio milhão de anos, as temperaturas quentes dominaram a maior parte desse tempo, com as temperaturas globais a subir repetidamente acima dos 26° e até dos 32° de temperatura media. Há cerca de 250 milhões de anos, perto do equador, a temperatura média estava nos 60°, impossibilitando a vida nessa região. A terra não tem 100 anos, nem 1 milhão de anos, o nosso planeta tem 4,5 mil milhões de anos. Há 635 milhões de anos, durante um recuo sem precedentes dos glaciares indica que as temperaturas aumentaram significativamente perto do final do Neoproterozóico, atingindo uma média global superior a 32°, quando a média global de hoje é inferior a 15,5°. Ao reconstruir as temperaturas do Éon Fanerozóico, ou aproximadamente no último meio milhão de anos, as temperaturas quentes dominaram a maior parte desse tempo, com as temperaturas globais a subir repetidamente acima dos 26° e até dos 32° de temperatura media. Há cerca de 250 milhões de anos, perto do equador, a temperatura média estava nos 60°, impossibilitando a vida nessa região.

1

And this is going to be hottest December on the record

1

A cause de l'activité humaine’ et pourtant cela ne gêne personne que nous soyons 10 milliards sur terre en 2100

1

My fear is keep crying wolf and when the wolf appears no one will care.

1

I presume this 'burst' of heat is El Nino related. At least I hope so because otherwise we may have passed a climatic tipping point.

1

"The 1.5'C Paris Agreement red line is dead and the 2.0'C red line is on life support." \n\nDr James Hansen.

1

Oh well at least it's not 1.5c, just 1.44.

1

Wow, crazy stats.

1

How can we bring students who are lacking skills up to speed on greenhouse gases

& global warming? I made this graphics-rich resource for our ELA and SPED students, which then became requested by college prep & honors students - Starting from "what is a greenhouse," we carefully move from one idea to the next, bringing all the students to where they need to be
<https://kaiserscience.wordpress.com/biology-the-living-environment/human-impact-on-ecosystems/global-warming-and-greenhouse-gases/>
After that (at this next link) I offer deeper, related resources:
<https://kaiserscience.wordpress.com/biology-the-living-environment/human-impact-on-ecosystems/>
Human-caused atmospheric changes
The Ozone layer and CFCs
Global warming has not stopped
Global warming Industry knew of climate change
Global warming isn't natural, and here's how we know
Climate skeptics are not like Galileo.
Causes of the California wildfires
The discovery of global warming - a full century ago
#globalwarming #climatechange #teachers #NGSS #STEM #Ecology

1

Note that the climb really starts in 1980 - exactly when China's massive industrial development began.

1

Jusst Jess

1

So depressing

1

If it is a recurring cycle; why don't we plan for it and be prepared for the destruction that comes.

1

The evidence screams that we're on a collision course with a bad future IF we do not change asap. It's about time politicians get off their penguin asses and enforce changes to industry to reverse this ominous trend.

1

The Mother Earth is in sorrow. Can we do something?

1

Thanks for defining 'anomaly' in this context. It is tiresome to have to explain the term repeatedly for people who cannot be bothered to look it up.

1

Fact !! During the 1950s houses built in miami and south Florida had fireplaces . None do anymore but they are slowly being eliminated into new housing constructed the further north you go .

1

Give up NASA, internet has liberated its "Google scientists" and they say you're fake. So let us with our naturally warming flat earth.

1

I am not blaming or deamonizing industrialization. But western industrialization is the cause. Now we know the cause, kindly direct statement to causing nations to upgrade industrialization to 7.0 to accommodate climate improvement.

1

At about 8243 B.P., there was a 3C rise in global surface temperature in less than a century, followed by an equally precipitous drop by 3C in less than a

century. Has anybody ever explained that? (Petit et al., Nature, 1999, w/over 7,000 citations)\n\nThen there was that retreat of the Laurentide glacier from the current location of Moraine, Ohio, that began about 23,000 years ago. What I want to know is, when we gain control of global surface temperature - a power we have never had - are we going to bring the glacial ice pack all the way back down to cover Dayton, or only enough to smother Canada?\n\nClimate change gave us Canada. Don't hate Canada.\n\nIt also gave us Lake Erie, Niagara Falls, Nantucket, Martha's Vineyard, Cape Cod, the British Isles, Scandinavia, and Switzerland.\n\nFor the love of cheese and chocolate, don't hate Switzerland.\n\nAnd if you're ever on Almenalp above the Kander Valley, just imagine Kandersteg under 1000 meters of pack ice as you look over to the alpine pasture on the opposite side.

1

NASA Climate Change can surely drop the mic now! Bravo.

1

Woah, NASA had the scariest Halloween post I've seen this year.

1

The industrial revolution was the beginning of the end for the human species.

1

Carbon increases, oxygen decreases.\n\nIs there a graph of nitrogen in the atmo? Shame we can't use that for energy.

1

A good visual representation of those memories that so many of us have of it being colder when we were growing up!

1

Despite amazing scientific research, not a single government in the world is prepared to address the problem of fossil fuel.

1

What do we do? Congress is negotiating away planet protections. Oil and gas gluttons are winning the fight and we are just about out of time. Want to remain hopeful, but it's getting tougher. What can we do?

1

Here is what you need to know about Climate Change...No one can define it. It's a big scary phrase used to part you with your money...which when you come to think about it, everything is used to part you with your money. So you should have seen it coming.

1

Our planet, and especially Earth's ecosystems, including humans, are experiencing constant threats to extinction humanity, at first - climate crisis, pandemics, near Earth flying objects (e.g. Appophis and other asteroids), ozone layer destruction or magnetic field altering or weakening and so on... not speaking already about techogenical catastrophs... if people were thinking about that, would be very helpul for ourselves...but till now we have some sceptics, denying clear signs..

1

Scary!

1

Erin Haas Brassil check out the Anoka reference in the post for this NASA climate graph

1

I wish if I shared this I could also share all of your responses to the doubters in comments. They're brilliant!

1

As soon as possible we should change our lifestyles .

1

When will we all agree to just stop burning stuff? Probably never, at least in my lifetime.

1

Yep! I remember cooler Halloweens!

1

NASA Climate Change Can you post graphics of industry revolution and the relation with CO2 emissions or Other gases that affect climate???\nRegards

1

That's one scary "Graph" Costume

1

To me it's just amazing to see how locked in the warming has been since 1980. Like a turning point was hit in 1980.

1

You are being gas-lighted. Have any of you heard at any time how the science of global temperature is measured. Probably not, which is why its so easy for NASA to fool you. They believe it themselves its been so successful a campaign. You all look at weather which is chaotic and always has been, you just hear more about it so you think its a real problem. Appeal to authority is a logical fallacy and this subject is rife with it. Check out some of the opposing thought on the subject mostly by scientist that no longer have anything to lose, Professors emeritus, retired climate scientists, they tell the truth. The orbit of Jupiter has more to do with our climate than carbon, and the sun is the major factor along with water vapor. Plants die at 150 ppm carbon and 400 ppm is no big deal. We have had ice ages with carbon at 800ppm, Do your own research people.

1

"Do you remember the famous 97% study - that 97% of climate science supported the consensus on human-caused climate change? Well we have just published an update for 2012-2021 papers in the same journal, Environmental Research Letters. The figure is now... drumroll

please...99.9%!"\n<https://news.cornell.edu/stories/2021/10/more-999-studies-agree-humans-caused-climate-change>

1

As Elizabeth Kolbert said in her book, "The Sixth Extinction" Man is doomed to be the sixth extinction if we do not act aggressively & immediately to address climate change!

1

Too bad we don't see Oct 1821 or 1721, just keep going back and you will find the medieval warming period peak as high as we are now, back well before the

little ice age. #

1

Scary! This is a great graphic to remind everyone that correlation is not causality. We know that even though kids want Halloween to be warm, the advent of trick or treating and such wishes did not *cause global temperature rises since then. For that, we should consult the experts who know even more (was: far more) than what is shown in a single graph. (Edited for clarity)

1

Never seen loess spelled that way. Must be American spelling.

1

Men argue. Nature acts.

1

Funny how every winter after a big blizzard, the same clowns will use it as their "proof" global warming is not true. \n\nUnfortunately a significant percentage of Americans vehemently deny the reality of human induced global warning, not based on facts but solely based on their political followings. \n\nThe science denial of the Republican party is one of the biggest threats to our planet.

1

politicians keep your hands off our scientists well done NASA forreal

1

In our area of the country (Pa) a lot of the snow plowing people are Republican who have been against emissions laws. Karma is a b*tch!

1

To those who cite a very cold day as evidence against global warming, Stephen Colbert once said "..and world hunger is over because I just ate lunch"

1

The next time you're sitting in bumper to bumper traffic with cars lined further than you can see, and then realize that every car expels 6 pounds of carbon per gallon burned, it adds up

1

1

How at some stages like 1900 to 1920 temperature drops in the graph?

1

1

please...NASA Climate Change ... \n ... \n Every year, the world emits 51 billion tons of greenhouse gases into the atmosphere. To prevent a climate catastrophe, we need to reduce this number to zero by the year 2050, and we must act now to do so..This is a measure of the general consumption rate on the planet for the year 2022 AD... .. Can you know the general consumption rate for the year 1960 AD... ????? Thank you very much for the answer... I love you all and wish you continued success...

1

Temperature increase was constantly rising up as the data suggest and extremes were more frequent. I hope they also include extremes too, maybe next extreme

can be predicted.

1

NASA Climate Change how well were climate stations dispersed in 1880? What assumptions are made in terms of comparability of data from back then until now?\n\nIt does make much sense to post data points for individual months.

1

The deniers don't realize that it may be 20 degrees colder here but it's that much warmer somewhere else on the planet \nThermal energy just doesn't disappear

1

Do you have another graph for before 1880?I listened to Randall Carlson talk about historic temperatures and sea level changes. What is your source of information NASA goes to for such records?I'd like to compare his charts with NASAs. His charts go back around 13000 years ago.

1

What PPM were the CO2 levels in atmosphere about 50million years ago? \nI found a graph that claims ~1500ppm, just wanted to see if that's legit; though if the correlation with CO2 in atmosphere and global avg temp is anything to go by, it would explain why a large portion of life on earth was cold blooded, right?

1

It's been getting warmer ever since the end of the little ice age. How surprising

1

Perhaps there are new lives being born who will have solutions to problems!

1

thank you for the research you do, and for sticking to the science when people want it politicize it.

1

It's amazing that well educated people I know still claim the global warming of today is just sheer coincidense, hence continuing to hide their heads in the sand! Also they can't seem to get it into their heads that it's not so much about hot weather but more aboutEXTREME weather which we do have plenty of now.

1

Weather is not climate! Climate allows extremes in weather whether it is extreme heat or cold or extreme drought or extreme precipitation/snow.

1

Great post NASA Climate Change. No doubt the fossil fuel trolls will soon be out in force.

1

I can only hope to someday attain the level of patience the person running NASA's social media has.

1

Small consolation, but it'll be in the high 60's as darkness falls where I live, so hopefully fewer folks will be burning wood and triggering asthma attacks and misery among young and old alike.

1

You are a big liar.\nThe Earth is Flat.\nThe Weather warmnes is beacause of Harp, chemtrails, and...that you and your friends did.\nIts not about weather

its about CONTROL.\nIts new enorm.

1

Jimmy Valmer

1

Wow! 100 years this year! I didn't know that.

1

Most of the disasters that you talked about. Is where the Earth is moving so the continents will move back together the United States is moving south and east it's not fast but it's moving and it's causing global warming. Because we are moving towards where it's warm. Why don't you look it up for yourself. We move one inch South every year and 3 in East every year. There is your global warming.

1

Thank you to all of you at NASA Climate Change for making a difference. I get really despondent sometimes over the path towards disaster we seem to be treading. It makes my heart happy to see other people still fighting the good fight.

1

An excellent way to visualise the invisible! Thanks

1

Time to really do something different. Time to build back better! Better! BETTER!

1

Someone forgot to mention to Florida that she was supposed to be warming. We haven't had an above average summer in 3 years now. I miss my childhood summers, when swimming was the only option.

1

Anthropogenic global warming is one symptom of a larger problem: The fact that we have exceeded the capacity of the planet to support us. We currently have no idea how to build a sustainable high technology civilisation, i.e. one that uses no finite natural resources, generates no pollution and produces no non-recyclable waste. Moving away from fossil fuels is necessary, but nowhere near sufficient. As a recent paper says:\n\n\"We cannot stress enough that a non-fossil energy regime simply cannot support anywhere close to the present human population of nearly eight billion; this urgently necessitates reducing human numbers as rapidly as possible to avoid unprecedented levels of social unrest and human suffering in the coming decades\".\n\n<https://www.mdpi.com/1996-1073/14/15/4508/htm>

1

As I understand it, even if we reduced emissions to pre-industrial age levels, we still have many meters of sea level rise baked into the oceans. Societies evolved in the relatively stable climate of the Holocene. It's time we developed adaptation approaches for societies that recognize transformation is inevitable and we have entered the Anthropocene. How, or if, societies can adapt is still unclear.

1

I don't know much but I think humanity need's to start taking better care of the

planet and what has happened to cleaner energy sources?

1

Sukhwinder Singh

1

Thank you NASA for continuing to highlight this climate catastrophe. Please keep the conversation going as there is a lot of ignorance to overcome.\n\nThe impacts of climate change are already here and are causing devastation to our ecology and environment. We need to campaign and lobby our governments to bring in legislation quickly.

1

omg. the slope of the blue line, then the yellow line, then the purple line and now the green line... keep getting steeper. not only are we heating up but we are heating up FASTER. this is insane. and the eruptions during the cooling periods...wonder if there will be cooling periods

1

we all on the same boat. i think if we didn't stop oil production by now the water would evaporate and goes outside earth.

1

1

Humans are not understanding life on earth because we only started to study it. Funny that the universe allows us to pretend we have a clue what a warmer earth actually means.

1

My question is to NASA. The air in a greenhouse is heated by solar radiation, an increase in solar radiation temperature would also increase temperature. If the temperature outside the earth's atmosphere is above the boiling point of water (approx. 120°C), is it not possible that an increase could affect the atmosphere. Also, heated cosmic radiation could affect the temperature. What comes to mind is the 'P' theory. In an outdoor public unheated pool, you come along a warm spot of water. (We all know what that means.) The solar system could be traveling through such a heated radiation cloud. The Milky Way galaxy has chaotic catastrophic events of stellar birth, life and death throughout. Clouds or jets of superheated radiation blasted into space. Well, we might be entering that space. But, closer to home, one just has to look at a frosted window, on a winter morning, as the light from the sun hits it. With temperatures below freezing, the sun's rays melts the frost. Back to my question, "Are we just beating a dead horse in hopes to ride forever?"

1

I don't understand the graph, what does it all mean?

1

Only 140 years of data?? C'mon now! We've been going through the same cycles for eons...

1

The question is, how can we help? Each of us could do a little everyday. I know many people who don't recycle, and the amount of trash that is dumped into the oceans, lakes, rivers, mountains it is huge, if we all really care there lost of

thinks we can do to make the world a better place, lest get informed and help, let's do it for the new generation.

1

Wonder what's causing these heat waves. And when are we starting the measuring in global Temps.

1

And in the last 20 years the variance is reduced by half or more. That probably means that the oceans are absorbing and releasing energy faster than they used to. That could be both the cause and the result of more severe weather systems. Just guessing.

1

I'm amazed that we've been warned since the 70's about greenhouse gases and I have seen little done over those years. My hopes were after the awareness was made so would action? And here we are.

1

Thank you Nasa for explaining the scientific evidence. I enjoy reading your articles. I know that I'm not a scientist, but learning and having respect for our earth, should be our ultimate goal.

1

I miss my " old school America" where we turned to our scientists and doctors for advice about issues of climate and public health.

1

Thank you NASA Climate Change. Your patience and thoroughness with deniers is remarkable. We need more scientists like you that can explain things to the average person. I hope to see more discussions like this. This is the World's number one problem and no one wants to talk about it.

1

Dear world, if there was ever a time for the world to UNITE it would be now. I invite all on planet earth to join me giving our beautiful planet a day off 1 day a week on Sundays. The only requirement needed for this to happen and become a reality is rest. The world is spending billions on UNCERTAINTY to save this planet trying to cool it, but cooling it is not changing the amount of emissions on earth or in the atmosphere. Watching and reading all that is being attempted and done is like watching the movie groundhog day. Trial and error, unknown results, uncertainty, knowing the damage and destruction, and doing it anyway. Repeat again and again and again. Why hasn't there ever been a time promoting no risk, effective solution to save planet earth eliminating the amount of emissions on and in the planet just by turning it all off? It is free and results are immediate. Maybe this will not change the amount of emissions in atmosphere from 10 yrs ago, but if earth got that rest 1 day a week it will absolutely rejuvenate all that is being used and needed for earth to be more efficient and effective. Stop experimenting with so much uncertainty that is potentially more destructive and work on promoting the world to give earth off on Sundays and shut it off! Maybe the results would be miraculous and would heal this planet quicker than we'd ever imagine. We will never know until it's done. Make that your great experiment to save the planet. There is no more time to waste and wildfires, fires and wars only escalated the time left! We have to act

immediately Knowing results not tomorrowS uncertainty! SHUT IT DOWN 1 day a week and NOW! Thanks. Spread the word

1

Suzie A. Woodruff-Gray

1

<https://linkso.medium.com/why-the-latest-on-climate-change-is-dire-and-probably-worse-than-theyre-telling-us-78a446c07273>

1

Don't worry...the very uneducated oil sycophant MAGAts assure us it is just weather .

1

<https://m.youtube.com/watch?v=2XuAhOnWQh8&pp=ygUzd2hhhdCB0aGUgbWVkaWNhbCBjb21tdW5pdHkgaGFzIHRvIHNeSBhYm91dCBjbGltYXRl>

1

CC? NO way to predict ACCURATELY!!

1

1

Genesis HC

1

Hot!

1

I'd like to go back to 1880, please.

1

How has The Sun changed in 100 years ..is it warmer for Earth

1

Climate change is a made up scenario from the Dems..... seems they never complain about all the pollution & garbage in 3rd world countries...., only America where we have clean energy

1

Lies compare the actual recorded temps to this chart and the lie is blatant... the 1930 were actually at or higher than the 2020 claims on this chart

1

" Where do you think September 2021 will be? " ... since nothing's been done to stop the warming trend, somewhere above where it is now ...

1

If I were a gambling man I'd look at the pattern. Every year the temperature has risen the one following has been the same or cooler. I wouldn't be surprised to see that pattern broken though. :)

1

I love watch NASA dunk on people who think they can "debunk" climate change

1

Its about to be a survival for the fittest, whether you are aware of the causes or not.

1

Oh my. I think there needs to be more done than just reducing carbon emissions. I hope there is a plan b and plan c in the works.

1

We need to do two things to ensure our species continuation, find other planets quickly. The need for deep space exploration is a must. literally families in space to ensure our continuation. And save our planet!!!! Really crack down with the 'Laws' on littering, pollution and stripping(mining, trees, even animals that. are becoming extinct).

1

We have also in the UK lost much of our sea grass - that is also, like trees, very effective at taking CO2 out of the cycle, for quite a while.

1

It is going to get very bad.

1

I hope for the Best., but it's Still Hot., and I have no idea how to react about all this crazy Weather., and everything that is been Going on at this moment., the only think I can do is Pray for mercy.

1

From where we can download this data?

1

Y vamos pa´riba...

1

When are we going to do something?

1

What caused the cooling after WW2?

1

Wow, cool! Or rather: not so cool!

1

Scientific denial, are we coming to the Middle Ages? People are dening NASA observations, scientific conclusions. Internet is realising stupidity. What's next? Flat Earth??

1

So in 140 years we have a temperature anomaly of 1 degree.

1

I thought it's stock market chart with indicator

1

The three eruptions from 1880 through 1920 dumped huge amounts of pollution into the atmosphere. And gases that create atmospheric warming.

1

It's worth remembering that land surfaces (red, in the graph below) warm at about twice the rate of global mean temperature rise (green), and the Arctic is warming around three times faster than the global mean. So, 2C of global warming would mean 4C of average warming on land, and 6C in the Arctic - these are huge changes over the space of a human lifetime, and we would struggle to adapt. Best to do something about it soon-ish...

1

The difficulty in arguing science with a scientist is that they know what they are talking about!

1

Can we also get a data to the left of 1880?... say 500 years span?

1

Remember the planet that we live on also went through an ice age...it goes through cycles. Js

1

Why don't some people believe in science? I just don't understand

1

I havent seen any difference anywhere. Go ahead and push that agenda though!

1

Taking a 140 years of temperature readings on a planet that is 4.5 billion years old and use those to form a meaningful conclusion or find a pattern would be the same as me interviewing a 100 year old person for less than one second... and use that information to then write their complete biography.

1

The deniers always with the same statements, again and again and again.

1

Joni Shepherd Silva Charles Silva

1

We are speedrunning global ecosystem collapse.

1

Is there anyone in NASA that can explain climate change to the president? Maybe with a short children's book with lots of pictures or maybe with puppets?

1

I find it interesting when people claim that CO2 can't possibly be the cause of the Earth warming because it is just a trace gas, yet the same people would acknowledge that this trace gas is responsible for all plant life on Earth.

1

Maybe this is what happened to Mars...we messed it up, came here and doing it all over again...meant as a joke, but I wouldn't be surprised.

1

decaf is like mouth to mouth were as caffeinated is a defibrillator electric jolt.

1

Hlw

1

1

1

Not if its good coffee beans, \nNot until I get jittery

1

Excellent

1

Thanks for sharing

1

Great advice!

1

That's a good analogy. \n\nI have thought that another one (involving the absorption of EM waves, though in the visible) might be: try putting a small amount (0.4cc) of blue die into a litre bottle of water. All of the water then has a faint blue tinge.

1

Before of after I drink it?

1

Kathy Schulz

1

Love this post! Great pedagogy

1

That's an excellent way to illustrate 400 ppm.

1

I'm in disagreement with someone that says that the heat waves of the 1930s prove that current climate science is wrong about CO2 levels and climate change. What is a good counterpoint to make?

1

The two most abundant gases (nitrogen and oxygen) comprise 99% of the atmosphere. Neither traps heat. By definition, all greenhouse gases are trace gases because they live in the remaining 1%. It's too bad the CO2 is naturally so sparse. If CO2 were naturally abundant like oxygen, our emissions wouldn't matter. We'd have a negligible impact. But because CO2 is naturally sparse, our emissions matter a lot. In fact, one-third of the CO2 in the atmosphere is due to human activity. We have to stop emitting and pull CO2 we've already emitted out of the atmosphere to stabilize the climate.

1

Plus you can literally measure the heat retention effect of CO2 in a glass container in a lab

1

Yes. I fall asleep on decaf and stay awake with real coffee. You can keep your brown sadness water thanks.

1

So what are we gonna do about it?

1

why the northern hemisphere warm more than the southern hemisphere?

1

Historical co2 data would make it an interesting post

1

Yes, and not even half a cup later that poor soul is gonna know it too.

1

Has the Earth ever had a concentration of over 1000 ppm?

1

I am so proud of whoever created this content. Please feel very very good about yourself today

1

Excellent example...very relatable to the Gen Pop. Complex topics...explained in understandable ways.

1

Yes, and carbon dioxide does not harm the Earth like you people are making it out to be. Fake climate change rhetoric, as usual.

1

excellent post! I defo feel the difference - one i can drink and the other makes me feel sick.

1

Does the CO2/ghg in the troposphere affect the stratosphere? Being warmer the troposphere must be expanding?

1

It is not the average temperature that is important, but the difference between night and day and the seasons.

1

It's always fun watching dropouts pretend to argue science with NASA.

1

Whenever NASA posts good, peer reviewed science I make sure to read the comments to see what the nut jobs have to say

1

Due to more carbon

1

nothing to see here folks...move right along...

1

I guess we need to do more to reduce CO2 emissions

1

How can the heat of the planet be measured accurately unless the body of the thermometer is placed in space and only the sensitive part on the earth just as it would not be accurate to measure anything by imprisoning the whole thermometer in it?

1

Now they're aware.

1

Planet Earth is warming up fast. Hurricanes, flooding, and spontaneous fires are occurring more often, with more intensity.

1

Republicans would rather boil the planet and destroy the lives of future generations than admit that liberals and scientists were correct about climate change. \n\nIt's literally that simple.

1

Please urge your political representatives to wake up and fight the fossil fuel industry.

1

If climate action is also important to you, don't miss this week's Firelight Chat on Wednesday - Climate: Where We Are and What to Do. Marianne will be joined by Peter Kalmus, climate scientist and author of Being the Change: Live Well and Spark a Climate Revolution. \nYou can watch the stream live directly on our website, marianne2024.com, or follow on Facebook, Twitter, or YouTube this Wednesday, July 12th at 6pm ET/ 3pm PT.

1

Awesome! Maybe I can start growing palm trees in my front yard?

1

This is what The CREATOR says about Climate abd weather.\n\n Amos 4:7\n"I also withhold rain from you when the harvest was still three months away. I sent rain on one town, but withheld it from another. One field had rain; another had none and dried up."\n\nZechariah 10:1\n"Ask the Lord for rain in the season of spring rain. The Lord makes the rain clouds, and He will give them showers of rain and crops in the field for everyone."\n\nJohn 3:8\n"The wind blows where it pleases, and you hear its sound, but you don't know where it comes from or where it is going. So it is with everyone born of the Spirit."

1

Earth Sun Screen - We as Collaborative Earthlings Launch Lightweight Material such as thin film darkened (tinted) plastic or some lightweight barrier (carbon fiber) into Outer Space to act as a Sunscreen /awning / louvers /pergola between the Earth and the Sun. Placed in orbit to block out the hottest portion of the sun's rays.\n\nTrojan Point / LaGrange Point - is the place between 2 orbiting bodies of gravity equilibrium. Equal pull in both directions. Wherein an object is stuck / suspended between the 2 orbiting bodies and appears motionless in the sky above. This point between the earth and the sun is called L1 (LaGrange1) andis located approx 3 weeks journey from earth, Possible Timeline: If 100 square miles of material are needed. And if we can launch 1 square mile of Sun Screen material per launch. 100 launches would be needed to assemble the full sun screen panel. Meaning an initial SunScreen Could in theory be fully installed in 1-2 years.\n\nThe Orbital Earth Sun Screen could be UV Blocking or tinted different colors to change the color output of the sun's light to benefit / amplify plant life with less heat or bad UV rays. Acting as not only a tint / "sunglass" but also a UV Light filter, blocking harmful UV Rays, while changing the output color of the sun to help plants grow faster, with less direct UV heat.\n\nAn Orbital Sunscreen could act as a Thermostat to control the sun's output to the earth. Giving Mankind Climate Control. It takes 3 weeks to get to L1 Lagrange Point 1. Maintenance, service, and crew change missions are possible. \n\nThis is Not a permanent fix. Only a delaying action. \nCan someone Calculate how big a \nSolid object \nSpaced apart panels\nwould have to be to have a 1 degree effect etc.?\n\nWould any benefits come from this?\nAdjustable Tint \nChange UV output / polarization for earth plantlife benefits\nChange Output Color for plantlife Benefits? \n\nThanks for any help or info on this matter

1

1

So when did we start directly measure temperatures?

1

We all have to move to the Sahara desert and use solar energy (very few trees to cut down in the Sahara)

1

I was born in 1960 and spend a lot of time outdoors. It's getting hotter and

storms are getting more intense.

1

No to plastic pollution

1

Andrew Bidi apropo de conversatia noastra, am vazut asta si am zis sa iti arat

1

Di pulau Jawa Indonesia sering gempa sekarang

1

Yet so many westerners don't believe or understand the simple science behind global warming. This is why BigOil still has so much power.

1

Dutchy Holland maybe you better move up a level in your apartment building

1

Sustainability VS Stability of climate change solution is a must

1

Say bye bye, Florida.

1

That's horrendous

1

Cue the science graduates of the universities of Google, Facebook, & YouTube.

1

You simply can't mess with science and the data collected by thousands of scientists and researchers. What will it take for politicians to finally take a stance to actually globally combat climate change????

1

By 2050....12-18 inches as the rate continues to accelerate , glad am 58 and not 28

1

Maybe if Fox had investigative journalists they would: 1: understand the physics of climate change and the dangers they present! 2: would expose the propaganda of the fossil fuel industry! 3: not mock those like AOC who are trying to make real change!\n\nHere: read this/watch real investigative reporters with hard data and not Fox charlatans!\n\nWatch and

learn!\n\n<https://www.pbs.org/video/the-power-of-big-oil-part-one-denial-redxh6/>

1

Are these the same 'Scientist' that claimed we were headed for an Ice Age in the late '70s? Yea, everybody should believe the science because scientists say so...

1

Can you show the correlation of earth temperatures and sun activity?

1

Our magnetic north has moved 30 miles a year since 2000, I think that qualifies that as in our lifetime

1

Oh dear

1

I think the emission of greenhouse gases will never stop. As long human still in

need of materials, industries and mining will never stop. Without mining life will be different today because everything we see in the world today is from mining. Stop mining, stop greenhouse gases emissions

1

You know how people say "The Earth's climate has been changing since long before people started using coal and gas and oil."? Well they're correct. \n\nBut how? Why does the climate change? \n\nIt's not magic. \n\nThe climate changes because the Earth's orbit varies - it isn't a perfect oval. No planet's orbit is perfect. \n\nThe tiny bit of change in our orbit means we get slightly more warmth from the sun during one phase and slightly less during the other. Just a tiny amount. \n\nThe variation in orbit is called the Milankovitch Cycle. \n\nDoes having a little more or less sun cause ice ages and warm spells? Not on its own.\n\nBut when the Earth's atmosphere warms just a smidge, the oceans warm up. And as they warm they release carbon dioxide. When they cool down, they absorb carbon dioxide. \n\nIt's just the nature of gases - they're absorbed into cool water and released when water warms up. Think about a pot of boiling water releasing bubbles.\n\nCarbon dioxide (CO2) traps heat. So as the CO2 level in the air rises, the atmospheric temperature increases. Which causes more CO2 to be released by the oceans. Which raises the temperature some more. \n\nIt's a positive feedback loop. \n\nWhen our orbit is in the cooler phase the temperature falls and the CO2 level slowly goes back down. Cooling off takes longer than warming up. \n\nDuring ice ages, the CO2 level was 180 parts per million (ppm) and during warm spells, the CO2 has been 280 ppm.\n\nIt's been a consistent system for 800,000 years. Heats up, cools very slowly. 180-280 ppm, back and forth. \n\nThe problem is...for 150 years we've been digging up fossil fuels and burning them, adding CO2 to the atmosphere. Gigatons of CO2. Every year. \n\nSo the CO2 level in the atmosphere is now over 400ppm. \n\nMore carbon dioxide traps more heat - like throwing another blanket on your bed. \n\nAnd climate change is causing more climate change. \n\nAs the permafrost in Siberia thaws, gigatons of methane gas are being released. Methane traps 30 times more heat than CO2. \n\nOnce-frozen Siberia has been burning, which releases more CO2. \n\nMelting glaciers mean the Earth loses reflectivity and absorbs more heat. Which causes more melting.

1

In terms raw CO2 ppm, the difference between now & 1750 is greater than the difference between 1750 and the last Ice Age. Just something to think about.

1

In 1750 how were they able to know the CO2 in Our Atmosphere?

1

How to drink water . How to observe.maybe .

1

Question to NASA. How do you calculate these average worldwide temperatures?

1

How can we stop increasing the amount of CO2?

1

What confuses me is if this coat is getting "puffier" how are all-time cold records still being broken? Is this normal?

1

A really good analogy of the effect of CO2 in our atmosphere.

1

Hey NASA any chance you could give us your annual fuel usage over the last 60 years?

1

I'm kinda surprised that the trolls blaming "Earth's natural cycles" haven't already chimed in...

1

Thats correct. There is a pattern also that alternates within our seismograph charts concerning our orbital plain, a Triannual process that reoccurs within our planets equinoxes...our seasons...they correlate.

1

Ruth Crowl Frank Bulbeck. Wow..

1

Denying human involvement in climate change does not change facts. The data is revealing.

1

Are you looking at sunspot data since they have been recording them and the correlation of effect on our climate? I have, and research shows sunspots have had huge effect on our climate, not to mention the effects of volcanic eruptions. For example when mt. St. Helens erupted it cooled earth entire temperature 1.5 degrees.

1

sad that its just a matter of time now.

1

I'm STILL waiting for that Next Ice Age scare in the '70s!

1

.98 Lowest smoothing

1

The 'die back' Is going to be horrendous.

1

Blah blah blah. There is nothing man can do to stop this or create this. Remember when scientists said the next ice age is coming. When Al Gore said the world wouldn't make 2012. Remember how many times these climate scientists changed the data to prove their beliefs. No offense NASA the data proves we are getting warmer. It does not prove However that man caused it.

1

Meziah Jolley what money, exactly?

1

Quit chopping down all the forest maybe that may help? Or is someone going to tell me that doesn't play a role?

1

Think how to neutralize the global warming?

1

115 Times More Than Man\n\n<https://scitechdaily.com/deadwood-releasing-10-9-gigatons-of-carbon-every-year-more-than-all-fossil-fuel->

emissions-combined/

1

Let's see an eon of comparison...this short a sample is ridiculous.

1

How much do this contribute to the sea level rise in oceans

\n<https://sealevel.nasa.gov/news/111/lasting-impressions-ice-age-echoes-affect-present-day-sea-level> Would be grateful for an answer

1

My understanding is that you don't account for solar activity(flare) to the climate and attribute that data towards human caused change which skews the conclusion. The climate may be changing but the % of human caused climate change is almost negligible if you account for the data properly.

1

Thank you for posting..and replying to the idiot deniers

1

By 'people' hope they refer to the BIG GREEDY ones ,the big manufacturing industry ...we swim in an ocean of plastic everything , from packaging your bread to plastic clothing and mostly everything in a household

1

Great metaphor

1

Excellent analogy

1

I love, and hate how NASA needs to use a 1st grade metaphor to convey this message. :D :(

1

I wish this was simply old news and we had people who cared as the wealthiest and most powerful. I wish we didn't have to fight to save a beautiful and healthy planet.

1

Climate change is and always has been in full motion. Its life on our volcanic planet. For every burp by 1 volcano puts out more gases and carbon monoxide than 1000 China cities combine. I want my money back you thief.

1

Can you show us a 100,000 year graph? Can you show us a 20,000 year graph of ocean levels?

1

BS, the democrats are behind this, 1 volcano can dump more than 100,000 autos, and the forest mismanagement on the west coast, if the environmental st would let them log the old growth that would never have happened.

1

Temperatures rising are from rising magma, that is what is warming ocean temperatures as well as land, and that is evident by increasing earthquakes and volcanic eruptions

1

Time has already long-run out to make any difference in global temperature reductions, it's far too late now. The gross stupidity of the human race will be

their own undoing. Serves them right for their pitiful arrogance. After humanity is extinct, the planet will once again heal itself over eons of time into the distant future, to once again become the paradise it was before the Humans harmed it.

1

Cut the crap. In the 70's the so-called experts tried to scare us to death saying we're all headed to another ice age! But I bet you liberal loons will block this post. Stop trying to cram this crap down our throats!!!!

1

If the greenhouse gas carbon dioxide is getting more in the Earth that would also mean it's getting denser. Why are the clouds not going up in elevation since they ride on the carbon dioxide oxygen mix

1

Exactly how long have they been keeping records. Clearly a blink of the eye in historical terms.

1

This earth has been changing since its conception \nI do believe in global warming.\nI would do away with combustion engines,(instead of spending this countries money to pay you for. Buying a car with better gas \nMileage.\nLike the President from 2008 to 2012 did when he first came Into office).\n2nd I would eliminate all plastics. When I was a kid we did not have much plastic.\nCoffee was in tins\nWater was in glasses, car headlights were all glass.\nThere was no island in the Pacific made of a\nPlastic.\nAlaska had glaciers that did ot melt.\nFolks wise up and let's protect Gods gift to us\nMother Earth

1

Your predictions are based on FAKED computer parameters.

1

Taking advantage of the naive. Climate has been changing since the beginning of time. What we are doing now has little affect. The earth corrects itself over time

1

Mean while we continue to destroy the natural carbon removal systems and add more crap we don't really need <https://phys.org/news/2012-06-algae-lichens-mosses-huge-amounts.html>

1

#ClimateChange #JPL #Anthropocene\n[<https://www.jpl.nasa.gov/topics/climate-change>]

1

Jim Vb

1

Brody Smith

1

We need fast and urgent funding to deal with the losses and damage

1

Manuel Edgardo Lugo Recart

1

James Procak because the expanding heat allows the cold to drop down it changes the currents that would keep the cold from dropping down in areas that did not have the colder temperatures. As you've seen more extreme weather events are happening more often. Events that occurred maybe once in fifty years are now occurring every few years.

1

Sadly

1

In the 70s we had fuel restrictions, general speed limit was dropped from 120km/h to 80. Filling stations closed overnight. Made long distance travel difficult. Trucks were not allowed to take freight between towns, trains had to be used. As a country, there was a huge drop in fuel used, as well as a disproportionate drop in traffic accidents and deaths. This got me thinking about all the carbon that over millions of years has been collected by the earth and now over a hundred we are digging it up and releasing it into the atmosphere... at some point it had to make a difference? I also thought about all the chemical uses of oil, we WILL use it up at some point! \n However, people using climate change for nefarious ends does us no favors, people sense this and attack our efforts to reverse climate change.

1

thank's of Philosophy share knowledge..., Partner..

1

Are you similarly confused by the all-time record heat and drought, where the hottest years ever recorded are being experienced right now, or is that invisible to you?

1

People co-evolved with other organisms like fungi. As the fungi adapt to a rapidly warming world, they are able to survive above human body temperature and pose a direct growing threat to human health.

\n\n<https://www.who.int/news/item/25-10-2022-who-releases-first-ever-list-of-health-threatening-fungi>

1

NASA Climate Change Is it not a bad idea to start building self sustaining city's under domes? And perfect that way of life before climate just abruptly changes? even if it's possible to just do one that data alone is priceless for future use. Just my humble opinion. I feel like the ship has sailed on trying to curtail the climate issue

1

I hope that each country should be reminded of their emissions by constantly tracking them in space and it is fascinating ,the coat should not be puffer.

1

Actually with current pledges in emission reductions we are still adding insulation layers year by year for the next 28 years (minimum). We need to be much quicker...

1

So, what you're say is we need more volcanic eruptions to blanket the earth with ash and cool it down? We're going to need Dr Evils help after all

1

Earth goes through these cycles every so often, the weather people has only been keeping data for a very short time and want to teach us about how the Earth behaves from millions of years back to our present day.....they are full of air.....

1

We are still at the tail end of an ice age. \n\nThe earth is SUPPOSED to be warming.\n\nWe just need to sequester the carbon we mined and turned to a gaseous phase

1

Southern hemisphere?

1

Alright... so who caused the ice age?

1

Anyone else think climate change is a natural part of earth's cycle

1

We never had climate change till they strady shooting rockets in to space. The more we explore space the words our planet changes. You blame our cars . What about rocket file it takes to lift off. To get in to space.

1

Can you continue back further in time, by whatever means you have to determine temperature?

1

Wow, we are almost as warm as we were in the medieval climate optimum around a thousand years ago!

1

Has a lot to do with the sun,

1

The VAST majority of Earths history has been a LOT warmer than we are now. Modern humans have only been around for a tiny fraction of that time. Trilobites must have not been very (green)...

1

What about 1936, very convenient to start at 1950

1

All this crap is based on false information so Scientists can continue to receive grants you guys who buy into this bull are truly gullible!!!

1

Hasn't our climate been warming since the ice age?\n\nMuch of earth was a tropical rain Forrest including Antarctica. North pole had a tropical climate as well. Is Earth just getting back to what it once was?

1

Climate change is a political issue created by the left to institute their policy. There is no global warming. It can't be proven. It does not exist

1

Where are the graphs for the Roman Warm Period and the Medieval Warm Period?

1

It,s Called Fall

1

NASA Climate Change Thanks for all the work and for your dedication especially for answering a lot of the sceptics comments with real scientific datas. Keep on doing a great job!

1

I'm afraid NASA has been added to my list of agencies with no credibility. Wow, that list just keeps growing.

1

No accountabilty for the fact our north pole has migrated so far they had to rewrite gps software? Since the magnetic poles are no longer diametrically opposed it weakens our magnetosphere which protects us from cosmic radiation. If your model does not account for this... youre not using science.

1

Hi NASA can you explain to me why this year would have been warmer when the CO gases where dramatically lowered because of the pandemic? I am not a denyer I am just trying to figure out the data.

1

Why start in 1951? Go back at lest 1000 years if you want any kind of climate picture!

1

Isn't it disingenuous to show increase in temperature since 1890? The coldest year in the last 600 years?

1

Here is the real story. It shows about 140,000 year cycles between ice age and warm periods.

1

What are you going to do about Mars. Mars is warming up faster than the earth. OH, YOU THINK IT MIGHT BE A CYCLE OF THE SUN, AND WE CANNOT DO ANYTHING ABOUT IT. If you're worried about air pollution, the U.S. has done a very good job of that. Go and talk to China and India about it. They're pretty much the world leaders in pollution

1

Do you not know that the axis has moved move than ever, do you know why...dont tell me climatic change

1

Theory is Free all the Dammed Rivers in the world. Let the rivers flow into the sea like God intended. Man plans God laughs.We are a planet of water. When you Dam a river you disrupt the rotation of Earth thus causing global warming

1

What causes the earths core to increase? And how much has it increased in the last 20 years?

1

We have Billions of asphalt on earth. World is not able to cool down from the asphalt. Due to fact holding in heat. Wake up stupid people. Yes other thing contribute also. Main problem asphalt

1

Why do Climate Change scientists never show up to debates on climate change? The earths surface has risen 1 whole degree in the last 1,000 years and y'all never

showed up to debate it???? Shocking

1

Need to spread your data out. Not saying we as humans dont need to be more efficient. Lots of spikes and valleys..

1

Moonlandings, climate change, covid, etc are hoaxes. Don't buy.

1

I remember in the 70's everything was about a new ice age. That did not happen.
\nRead Apocalypse Never by Micheal Sellenberger. Get some real, solid information

1

1

Summers are getting hotter and winters are getting colder as a result of climate change

1

Our Planet is Hotter!!!\nAnd Climate Change is Here !!!\nThese People are Experts !!!\nSimple as That !!!\nNow Let Me Put it To You This Way !!!\nThere is No Planet B !!!!!

1

Andy Welborn

1

NASA climate, thank you

1

Dalton Van Stratten this is interesting!

1

Excellent reports by NASA. Too bad be are living in an Era of celebrating ignorance.

1

That is only 150 years of data. Periods of global heating and cooling have lasted for thousands of years according to geological data. The temperature could start a downward cycle at any time

1

One (1) degree C in 140 years...\n\n...got it

1

If Christians actually read their Bibles they would know that Climate Change is completely biblical! To deny climate change is to deny the Bible!

1

Okay Students...repeat after me truth NUCLEAR BOMBS EITHER BEING TESTED ABOVE OR BELOW GROUND NUKING FORIEGN COUNTRIES!!!! And repeat the lie it's air pollution causing global warming. From your car factories, or coal factories, or air pollution from exhaust fumes from vehicles or candy factories or whatever government or eco friendly tree huggers says it is cuz they wouldn't lie and place a thousand taxable regulations on innocent people ever

1

Can we speak about a climate change based only on data between 1880 - 2020 ?

1

unfortunately

1

Lower

1

Don't worry. It will start getting cooler now. And when you're freezing cold nobody will be talking about global warming. Then it will be when will this freeze end. It was a very mild summer in CA this year.

1

The sad thing is that if we look at projected crude oil demand and new coal fired power plants coming online next 10 years this graph will continue to increase exponentially

1

Re ord being from 1860 something...lolol

1

The climate is changing but it's ridiculous to think that we humans can change that! If we're the cause what caused the last ice age to melt??

1

"I dont think science knows!"

1

Link doesn't seem to be working, can you repost?

1

It's not all Climate change believe me there's a lot of other things to consider here & u all no it. The lying Democrats think their always right u know it.

1

What was the reason for the dust bowl in the 1920's

1

Global warming , it's happened before , it's happening now , it will happen again. There will probably be an Ice Age . Live life while your still here.

1

Climate change is real

1

Oh, don't worry - \nprez said that soon it will start cooling down again.

1

Why start at 1951?

1

How does one go about taking the earth's temperature? I know how to take my own temperature, but that's it. If it's a matter of taking a bunch of temperatures in a bunch of locations, how do you decide which locations?

1

Is there a reason the change escalates so drastically in the 1980s?\n\nI know we saw a huge spike in CO2 at the start of the Industrial Revolution, and by this chart we can see the temps increase around that time but they stay mostly steady-ish up until roughly 1980 then it starts to spike again.

1

The Southern Hemisphere has gotten colder, which means what then...

1

We're experiencing severe, abnormal weather patterns. Climate change is a real

```
threat and sadly I believe we are too late.  
1  
Name: count, dtype: int64
```

```
[71]: df['likesCount'].value_counts()
```

```
[71]: likesCount  
0      223  
1       93  
2       39  
3       34  
4       25  
6       14  
5        9  
9        7  
10       7  
18        5  
16        5  
13        5  
15        4  
19        4  
11        4  
12        4  
7         3  
28        3  
24        3  
8         3  
17        2  
34        2  
37        2  
43        2  
21        2  
22        2  
14        2  
110       1  
120       1  
46        1  
55        1  
38        1  
126       1  
62        1  
40        1  
20        1  
27        1  
54        1  
33        1  
26        1
```

```
32      1
Name: count, dtype: int64
```

```
[75]: text="Neat comparison I have not heard it before and .\n I would say that CO2_
      ↪is.like a disco ball so energy and collide with countless molecules as it_
      ↪bounces around in our temperature"

def irrelevant_characters(text):
    cleaned_text=re.sub(r'[^a-zA-Z\s]', '',text)
    return cleaned_text
```

```
[77]: cleaned_text=irrelevant_characters(text)
      print(cleaned_text)
```

```
Neat comparison I have not heard it before and
 I would say that CO islike a disco ball so energy and collide with countless
molecules as it bounces around in our temperature
```

```
[81]: from nltk.tokenize import word_tokenize
      nltk.download('punkt')
      nltk.download('stopwords')
      def tokenize_text(text):
          tokens=word_tokenize(text)
          return tokens
```

```
[nltk_data] Downloading package punkt to
[nltk_data]   C:\Users\kmuba\AppData\Roaming\nltk_data...
[nltk_data]   Package punkt is already up-to-date!
[nltk_data] Downloading package stopwords to
[nltk_data]   C:\Users\kmuba\AppData\Roaming\nltk_data...
[nltk_data]   Package stopwords is already up-to-date!
```

```
[83]: tokens=tokenize_text(text)
      print(tokens)
```

```
['Neat', 'comparison', 'I', 'have', 'not', 'heard', 'it', 'before', 'and', '.',
'I', 'would', 'say', 'that', 'CO2', 'is.like', 'a', 'disco', 'ball', 'so',
'energy', 'and', 'collide', 'with', 'countless', 'molecules', 'as', 'it',
'bounces', 'around', 'in', 'our', 'temperature']
```

```
[85]: from nltk.corpus import stopwords
      def stopwords_removal(text):
          words=word_tokenize(text)
          filtered_texts=[word for word in words if word.lower() not in stopwords.
      ↪words()]
          filtered_texts=' '.join(text)
          return filtered_texts
```

```
[87]: filtered_texts=stopwords_removal(text)
      print(filtered_texts)
```

Neat comparison I have not heard it before and .

I would say that CO2 is like a disco ball so energy and collide with countless molecules as it bounces around in our temperature

```
[89]: from nltk.stem import PorterStemmer
      def stemming(text):
          words=word_tokenize(text)
          porter_stemmer =PorterStemmer()
          stem = [porter_stemmer.stem(word) for word in words]

          return stem
```

```
[91]: stem=stemming(text)
      print(stem)
```

```
['neat', 'comparison', 'i', 'have', 'not', 'heard', 'it', 'befor', 'and', '.',
'i', 'would', 'say', 'that', 'co2', 'is.lik', 'a', 'disco', 'ball', 'so',
'energi', 'and', 'collid', 'with', 'countless', 'molecul', 'as', 'it', 'bounc',
'around', 'in', 'our', 'temperatur']
```

```
[93]: x=df['likesCount']
      y=df['text']
```

```
[97]: x
```

```
[97]: 0      2
      1      0
      2      1
      3      4
      4     16
      5      4
      6     10
      7      1
      8      0
      9      4
     10      6
     11      1
     12      3
     13     18
     14      3
     15     14
     16     40
     17      1
     18      0
```

19	0
20	0
21	0
22	0
23	0
24	0
25	1
26	0
27	0
28	0
29	4
30	1
31	21
32	19
33	3
34	3
35	1
36	2
37	5
38	3
39	0
40	1
41	1
42	12
43	0
44	0
45	0
46	0
47	19
48	2
49	0
50	1
51	2
52	1
53	2
54	1
55	2
56	4
57	2
58	5
59	1
60	4
61	2
62	2
63	1
64	9
65	1

66	0
67	1
68	0
69	0
70	0
71	0
72	1
73	0
74	1
75	0
76	0
77	0
78	1
79	10
80	24
81	18
82	33
83	10
84	0
85	9
86	1
87	0
88	0
89	0
90	0
91	0
92	1
93	1
94	0
95	0
96	5
97	1
98	1
99	0
100	1
101	0
102	13
103	5
104	26
105	6
106	2
107	0
108	0
109	19
110	43
111	9
112	0

113	3
114	15
115	0
116	0
117	3
118	0
119	0
120	1
121	0
122	22
123	1
124	3
125	6
126	110
127	4
128	18
129	1
130	8
131	0
132	0
133	0
134	0
135	2
136	2
137	0
138	0
139	0
140	1
141	2
142	1
143	1
144	0
145	2
146	9
147	16
148	2
149	1
150	0
151	2
152	4
153	0
154	2
155	0
156	4
157	0
158	3
159	4

160	1
161	3
162	0
163	16
164	2
165	6
166	2
167	2
168	1
169	3
170	5
171	10
172	4
173	28
174	0
175	15
176	16
177	3
178	7
179	0
180	0
181	0
182	0
183	3
184	0
185	1
186	11
187	6
188	1
189	6
190	0
191	3
192	0
193	1
194	10
195	0
196	0
197	2
198	1
199	1
200	0
201	1
202	6
203	0
204	37
205	1
206	0

207	2
208	0
209	9
210	0
211	0
212	0
213	54
214	6
215	4
216	13
217	4
218	0
219	0
220	1
221	3
222	2
223	1
224	0
225	1
226	0
227	0
228	0
229	0
230	1
231	2
232	1
233	0
234	0
235	0
236	1
237	1
238	0
239	0
240	0
241	0
242	1
243	4
244	1
245	2
246	0
247	1
248	1
249	11
250	0
251	1
252	1
253	1

254	2
255	27
256	22
257	18
258	6
259	12
260	5
261	4
262	4
263	3
264	6
265	2
266	1
267	1
268	1
269	1
270	3
271	1
272	0
273	1
274	0
275	2
276	0
277	0
278	0
279	1
280	0
281	0
282	0
283	0
284	0
285	0
286	4
287	0
288	0
289	0
290	0
291	0
292	0
293	3
294	0
295	0
296	2
297	0
298	0
299	0
300	1

301	1
302	2
303	2
304	4
305	0
306	1
307	0
308	0
309	1
310	0
311	0
312	1
313	0
314	0
315	1
316	8
317	1
318	1
319	0
320	11
321	2
322	0
323	0
324	0
325	0
326	0
327	0
328	0
329	0
330	0
331	0
332	1
333	0
334	0
335	0
336	0
337	0
338	0
339	0
340	0
341	0
342	3
343	0
344	28
345	12
346	0
347	0

348	24
349	20
350	0
351	9
352	3
353	10
354	14
355	3
356	17
357	5
358	6
359	7
360	0
361	1
362	4
363	6
364	18
365	0
366	1
367	1
368	0
369	0
370	4
371	6
372	34
373	0
374	0
375	0
376	0
377	0
378	0
379	21
380	4
381	2
382	0
383	2
384	0
385	0
386	0
387	0
388	3
389	3
390	0
391	0
392	1
393	1
394	3

395	24
396	4
397	120
398	4
399	3
400	0
401	1
402	0
403	0
404	1
405	0
406	0
407	3
408	34
409	0
410	1
411	0
412	0
413	0
414	3
415	2
416	5
417	2
418	5
419	1
420	19
421	0
422	3
423	0
424	0
425	15
426	37
427	62
428	9
429	1
430	0
431	0
432	1
433	126
434	7
435	17
436	8
437	43
438	0
439	0
440	0
441	10

442	38
443	28
444	0
445	1
446	0
447	0
448	0
449	0
450	55
451	0
452	0
453	3
454	0
455	0
456	1
457	1
458	0
459	0
460	0
461	0
462	0
463	1
464	0
465	0
466	0
467	1
468	0
469	0
470	0
471	0
472	0
473	4
474	0
475	0
476	0
477	0
478	0
479	0
480	0
481	0
482	0
483	1
484	0
485	4
486	0
487	0
488	0


```

489      0
490      0
491      2
492     15
493     13
494      3
495     16
496      1
497     13
498      2
499     13
500      0
501     11
502     46
503     32
504      2
505      3
506      0
507      1
508      3
509      0
510      0
511      3
512      0
513      0
514      1
515      0
516      6
517      0
518      1
519      3
520      1
521     12
Name: likesCount, dtype: int64

```

```
[99]: y
```

```

[99]: 0      Neat comparison I have not heard it before.\n ...
      1      An excellent way to visualise the invisible! T...
      2      Does the CO2/ghg in the troposphere affect the...
      3      excellent post! I defo feel the difference - o...
      4      Yes, and carbon dioxide does not harm the Eart...
      5      Excellent example...very relatable to the Gen ...
      6      I am so proud of whoever created this content...
      7      Has the Earth ever had a concentration of over...
      8      Yes, and not even half a cup later that poor s...
      9      Historical co2 data would make it an interesti...

```

10 why the northern hemisphere warm more than the...
 11 So what are we gonna do about it?
 12 Yes. I fall asleep on decaf and stay awake wit...
 13 Plus you can literally measure the heat retent...
 14 The two most abundant gases (nitrogen and oxyg...
 15 That's an excellent way to illustrate 400 ppm.
 16 I find it interesting when people claim that C...
 17 Love this post! Great pedagogy
 18 Kathy Schulz
 19 Before of after I drink it?
 20 That's a good analogy. \n\nI have thought that...
 21 Great advice!
 22 Thanks for sharing
 23 Excellent
 24 Not if its good coffee beans, \nNot until I ge...
 25
 26 *****
 27 Hlw
 28 decaf is like mouth to mouth were as caffeinat...
 29 Maybe this is what happened to Mars...we messe...
 30 It is not the average temperature that is impo...
 31 It's always fun watching dropouts pretend to a...
 32 Whenever NASA posts good, peer reviewed scienc...
 33 Due to more carbon
 34 Maybe if Fox had investigative journalists the...
 35 By 2050...12-18 inches as the rate continues to...
 36 You simply can't mess with science and the dat...
 37 Cue the science graduates of the universities ...
 38 That's horrendous
 39 Say bye bye, Florida.
 40 Sustainability VS Stability of climate change ...
 41 Dutchy Holland maybe you better move up a leve...
 42 Yet so many westerners don't believe or unders...
 43 Di pulau Jawa Indonesia sering gempa sekarang
 44 Andrew Bidi apropo de conversatia noastra, am ...
 45 The "greenhouse effect" is concerned with the ...
 46 No to plastic pollution
 47 I was born in 1960 and spend a lot of time out...
 48 We all have to move to the Sahara desert and u...
 49 So when did we start directly measure temperat...
 50
 51 Earth Sun Screen - We as Collaborative Earthli...
 52 This is what The CREATOR says about Climate ab...
 53 Awesome! Maybe I can start growing palm trees ...
 54 If climate action is also important to you, do...
 55 Please urge your political representatives to ...
 56 Republicans would rather boil the planet and d...

57 Planet Earth is warming up fast. Hurricanes, ...
 58 Now they're aware.
 59 How can the heat of the planet be measured acc...
 60 I guess we need to do more to reduce CO2 emiss...
 61 NaN
 62 nothing to see here folks...move right along...
 63 I'm in disagreement with someone that says tha...
 64 We are speedrunning global ecosystem collapse.
 65 NaN
 66 NaN
 67 Wonder what's causing these heat waves. And wh...
 68 Joni Shepherd Silva Charles Silva
 69 Genesis HC
 70
 71 CC? NO way to predict ACCURATELY!!
 72 <https://m.youtube.com/watch?v=2XuAhOnWQh8&pp=y...>
 73 Don't worry...the very uneducated oil sycophan...
 74 <https://linkso.medium.com/why-the-latest-on-cl...>
 75 Suzie A. Woodruff-Gray
 76 NaN
 77 NaN
 78 Dear world, if there was ever a time for the w...
 79 Thank you NASA Climate Change. Your patience ...
 80 I miss my " old school America" where we turn...
 81 Thank you Nasa for explaining the scientific e...
 82 I'm amazed that we've been warned since the 70...
 83 And in the last 20 years the variance is reduc...
 84 The question is, how can we help? Each of us c...
 85 Time to really do something different. Time to...
 86 Only 140 years of data?? C'mon now! We've been...
 87 I don't understand the graph, what does it all...
 88 My question is to NASA. The air in a greenhous...
 89 Humans are not understanding life on earth bec...
 90
 91 we all on the same boat. i think if we didn't ...
 92 omg. the slope of the blue line, then the yel...
 93 Thank you NASA for continuing to highlight thi...
 94 Sukhwinder Singh
 95 I don't know much but I think humanity need's ...
 96 As I understand it, even if we reduced emissio...
 97 Anthropogenic global warming is one symptom of...
 98 Someone forgot to mention to Florida that she ...
 99 Hot!
 100 I'd like to go back to 1880, please.
 101 How has The Sun changed in 100 years ..is it ...
 102 Climate change is a made up scenario from the ...
 103 The deniers always with the same statements, a...

104 Taking a 140 years of temperature readings on ...
 105 I havent seen any difference anywhere. Go ahe...
 106 Why don't some people believe in science? I ju...
 107 Remember the planet that we live on also went ...
 108 Can we also get a data to the left of 1880?...
 109 The difficulty in arguing science with a scien...
 110 It's worth remembering that land surfaces (red...
 111 The three eruptions from 1880 through 1920 dum...
 112 I thought it's stock market chart with indicat...
 113 So in 140 years we have a temperature anomaly ...
 114 Scientific denial, are we coming to the Middle...
 115 Wow, cool! Or rather: not so cool!
 116 What caused the cooling after WW2?
 117 When are we going to do something?
 118 Y vamos pa'riba...
 119 From where we can download this data?
 120 I hope for the Best., but it's Still Hot., an...
 121 It is going to get very bad.
 122 We have also in the UK lost much of our sea gr...
 123 We need to do two things to ensure our species...
 124 Oh my. I think there needs to be more done tha...
 125 Its about to be a survival for the fittest, wh...
 126 I love watch NASA dunk on people who think the...
 127 If I were a gambling man I'd look at the patte...
 128 " Where do you think September 2021 will be? ...
 129 Lies compare the actual recorded temps to this...
 130 Are these the same 'Scientist' that claimed we...
 131 Can you show the correlation of earth temperat...
 132 Our magnetic north has moved 30 miles a year s...
 133 Are you looking at sunspot data since they hav...
 134 Need to spread your data out. Not saying we as...
 135 Why do Climate Change scientists never show up...
 136 We have Billions of asphalt on earth. World is...
 137 What causes the earths core to increase? And h...
 138 Theory is Free all the Dammed Rivers in the wo...
 139 Do you not know that the axis has moved move t...
 140 What are you going to do about Mars. Mars is w...
 141 Here is the real story. It shows about 140,000...
 142 Isn't it disingenuous to show increase in temp...
 143 Why start in 1951? Go back at lest 1000 years ...
 144 Hi NASA can you explain to me why this year wo...
 145 No accountabilty for the fact our north pole h...
 146 I'm afraid NASA has been added to my list of a...
 147 NASA Climate Change Thanks for all the work an...
 148 It,s Called Fall
 149 Where are the graphs for the Roman Warm Period...
 150 Climate change is a political issue created by...

151 Hasn't our climate been warming since the ice ...
 152 All this crap is based on false information so...
 153 What about 1936, very convenient to start at 1950
 154 The VAST majority of Earths history has been a...
 155 Has a lot to do with the sun,
 156 Wow, we are almost as warm as we were in the m...
 157 Can you continue back further in time, by what...
 158 We never had climate change till they strady s...
 159 Anyone else think climate change is a natural ...
 160 Alright... so who caused the ice age?
 161 Moonlandings, climate change, covid, etc are h...
 162 Southern hemisphere?
 163 I remember in the 70's everything was about a ...
 164 Summers are getting hotter and winters are get...
 165 The Southern Hemisphere has gotten colder, wh...
 166 Is there a reason the change escalates so dras...
 167 How does one go about taking the earth's tempe...
 168 Why start at 1951?
 169 Oh, don't worry - \nprez said that soon it wil...
 170 Climate change is real
 171 Global warming , it's happened before , it's h...
 172 What was the reason for the dust bowl in the19...
 173 It's not all Climate change believe me there's...
 174 Link doesn't seem to be working, can you repost?
 175 "I dont think science knows!"
 176 The climate is changing but it's ridiculous to...
 177 Re ord being from 1860 something...lolol
 178 The sad thing is that if we look at projected ...
 179 Don't worry. It will start getting cooler now...
 180 Lower
 181 unfortunately
 182 Can we speak about a climate change based only...
 183 Okay Students...repeat after me truth NUCLEAR ...
 184 If Christians actually read their Bibles they ...
 185 One (1) degree C in 140 years...\n\n...got it
 186 That is only 150 years of data. Periods of glo...
 187 Excellent reports by NASA. Too bad be are liv...
 188 Dalton Van Stratten this is interesting!
 189 NASA climate, thank you
 190 Andy Welborn
 191 Our Planet is Hotter!!!\nAnd Climate Change is...
 192
 193 We are still at the tail end of an ice age. \n...
 194 Earth goes through these cycles every so often...
 195 So, what you're say is we need more volcanic e...
 196 Thank you for posting..and replying to the idi...
 197 My understanding is that you don't account for...

198 How much do this contribute to the sea level r...
 199 Let's see an eon of comparison...this short a sa...
 200 115 Times More Than Man\n\nhttps://scitechdail...
 201 Think how to neutralize the global warming?
 202 Quit chopping down all the forest maybe that m...
 203 Meziah Jolley what money, exactly?
 204 Blah blah blah. There is nothing man can do to...
 205 The 'die back' Is going to be horrendous.
 206 .98 Lowest smoothing
 207 I'm STILL waiting for that Next Ice Age scare ...
 208 sad that its just a matter of time now.
 209 Denying human involvement in climate change do...
 210 Oh dear
 211 Ruth Crowl Frank Bulbeck. Wow..
 212 Thats correct. There is a pattern also that al...
 213 I'm kinda surprised that the trolls blaming "E...
 214 Hey NASA any chance you could give us your ann...
 215 A really good analogy of the effect of CO2 in ...
 216 What confuses me is if this coat is getting "p...
 217 How can we stop increasing the amount of CO2?
 218 Question to NASA. How do you calculate these a...
 219 How to drink water . How to observe.maybe .
 220 In 1750 how were they able to know the CO2 in ...
 221 In terms raw CO2 ppm, the difference between n...
 222 You know how people say "The Earth's climate h...
 223 I think the emission of greenhouse gases will ...
 224 By 'people' hope they refer to the BIG GREEDY ...
 225 Great metaphor
 226 Excellent analogy
 227 I love, and hate how NASA needs to use a 1st g...
 228 Actually with current pledges in emission redu...
 229 I hope that each country should be reminded of...
 230 NASA Climate Change Is it not a bad idea to st...
 231 People co-evolved with other organisms like fu...
 232 Are you similarly confused by the all-time rec...
 233 thank's of Philosophy share knowledge..., Part...
 234 In the 70s we had fuel restrictions, general s...
 235 Sadly
 236 James Procak because the expanding heat allows...
 237 Manuel Edgardo Lugo Recart
 238 NaN
 239 We need fast and urgent funding to deal with t...
 240 Brody Smith
 241 Jim Vb
 242 #ClimateChange #JPL #Anthropocene\n[https://ww...
 243 Mean while we continue to destroy the natural ...
 244 Taking advantage of the naive. Climate has bee...

245 Your predictions are based on FAKED computer p...
 246 This earth has been changing since its concep...
 247 Exactly how long have they been keeping record...
 248 If the greenhouse gas carbon dioxide is gettin...
 249 Cut the crap. In the 70's the so-called expert...
 250 Time has already long-run out to make any diff...
 251 Temperatures rising are from rising magma, tha...
 252 BS, the democrats are behind this, 1 volcano c...
 253 Can you show us a 100,000 year graph? Can you ...
 254 Climate change is and always has been in full ...
 255 I wish this was simply old news and we had peo...
 256 Is there anyone in NASA that can explain clima...
 257 Thank you to all of you at NASA Climate Change...
 258 The current ruling class, who has control over...
 259 Most of the disasters that you talked about. I...
 260 Wow! Well, I suppose the ultimate expert on GW...
 261 The fastest way to reduce car emissions is to ...
 262 To keeping our families. Together and work on ...
 263 These people in the comment section who haven'...
 264 The data is there, scientific information is t...
 265 Plant more trees stop building malls build in ...
 266 Changes to our climate are from our magnetic f...
 267 Natural disasters. Hard to security? I wish th...
 268 Global warming seems to be accelerating.
 269 Glaciers are melting, sea levels are rising, ...
 270 It's as close to you as Air.. We must go to So...
 271 But it seems to me that wildfires does not hap...
 272 I am a outdoors man in baltimore for 53 year's...
 273 All this is the real truth but only our presid...
 274 All I can say about all these changes----- I k...
 275 We need to combat climate change so that the p...
 276 The academic consultants to IPCC (Internationa...
 277 There are many factors involved and I am not g...
 278 Best Aug we ever had here? But maybe a protes...
 279 What's this, like the 19th hottest year on rec...
 280 What happened between the 20's and 40's? What ...
 281 Please send this informative article to our sc...
 282 That is going to give Wyoming a wonderful year...
 283 The reason to all this happened because our pl...
 284 There are lots of new things happening in our ...
 285 The hottest decade was the 1930's, and still i...
 286 We all play a part...as a world we need to do...
 287 NaN
 288 Did you know that climate records only reliabl...
 289 Northern hemisphere summer
 290 Pensé que estaba sola en el tema de salvar el ...
 291 Pois e preocupantemas acreditem no actual pres...

292 What would happen if we had Global Cooling????
 293 The comments on this post are terrifying, didn...
 294 1 degree change? Am I reading this right?
 295 Great Science!! Hard to deny!
 296 The comments are a fun read. Entertained by th...
 297 Lokepasa ke usa tiran mucho plástico y eso est...
 298 quick search says change by 1.5° C is 2.7° cha...
 299 Oh my ... climate change effects us all
 300 Humans we are terrible to our planet.
 301 Donald Trump; Does Not Believe In Global Warmi...
 302 So glad NASA doesn't let the trolls and denial...
 303 Its crazy how people negate science like this...
 304 I wrote a very researched term paper in 1999 o...
 305 Es triste todo lo que esta pasando todo se des...
 306 Do not agree with climate change
 307 More love , tu ecologic tying positive, bendy...
 308 The earth does have a 1/2 life.
 309 Save the planet
 310 Gracias ami tambien me da mucha tristeza Como ...
 311 Yes thank you were dead in November
 312 Ivy Pantel-LaForge\n\nThe comments on this pos...
 313 move to south pole
 314 Its to late check mate
 315 Pues ay que aser algo para salvar nuestro plan...
 316 After all these decades protecting and informi...
 317 It was "global warming" until science noticed ...
 318 \nNASA wants you to believe that man is the so...
 319 NaN
 320 Also people are forgetting about the delay fac...
 321 I'm in southern Ontario Canada and we are bla...
 322 NaN
 323 Bruce Threlfall
 324 In deed.
 325 Hello PEOPLE its Happening in our Lifetime
 326 INTERESTING
 327 Ya it's going to happen
 328 Sooooooo
 329 .
 330 Thanks
 331 NaN
 332 Dont agree
 333 NaN
 334 We are the
 335 Among other things too !
 336 NaN
 337 Wake up people's!!!!
 338 NaN

339 Fake.
 340 NaN
 341 NaN
 342 Vote
 343 Msfloodprevention.com\nSave lives and land
 344 I can't help but notice the hot spots on the w...
 345 This is becoming a trend, for those that are n...
 346 Good game forfeit at 2024
 347 does the solar maximum affect \nthe earth's co...
 348 Ok but what about like the 5 billion years bef...
 349 So much denial propaganda from those who don't...
 350 Not every day of course, but we've been having...
 351 Caused by human activities is the biggest lie...
 352 And the denialists and conspiracists show up e...
 353 Our government promotes fear for funding, if y...
 354 One thing is common among climate change denie...
 355 If you can't give me a basic description about...
 356 From another site\n\nThe climate change hoax h...
 357 and the solar flare high activity has nothing ...
 358 I love this weather couldn't have a better win...
 359 That normal because we are entering 12000 cycl...
 360 We forgot a huge informations about climatic c...
 361 I thought we are having an El Niño
 362 John Kerry to the rescue with his private jet.
 363 This is what happens when politicians are in c...
 364 NASA is a reliable source ; I really dont unde...
 365 La tendencia del calentamiento se mantiene, ge...
 366 I wonder if over population has anything to do...
 367 Did the Canadian wilfires have an effect?
 368 Vielleicht ist ja die Nordhalbkugel zZ etwas m...
 369 My friend Ben Ben thinks climate change is a h...
 370 What agenda is NASA pushing now?
 371 Joe has it all figured out how to fix it.
 372 Everyone knows what's going to happen, why it'...
 373 oooooohot....oooooobad
 374 NaN
 375 And?..
 376 Move the thermometer back to where it was then...
 377 What is the reason of this global augmentation...
 378 After Human extinction, carbon in the atmosphe...
 379 November and December has been the coldest eve...
 380 Back in the 90s, we used to wear sweaters on c...
 381 Edward Motzi This sounds like you:
 382 ,there's still plenty of flat earthers around.
 383 It's all happened before.
 384 Y cada año será más caliente
 385

386 There is no time
 387 Heavy rain Heiker Mendozaa
 388 NaN
 389 Bs
 390 At a rate of 10-20 breaths per minute, join th...
 391 These turd stains think it's funny.
 392 Fake garbage nasa lies
 393 BS.
 394 AGW is not linear.
 395 Cue The deniers screaming over this being fak...
 396 Note that the climb really starts in 1980 - ex...
 397 You are being gas-lighted. Have any of you hea...
 398 To me it's just amazing to see how locked in t...
 399 That's one scary "Graph" Costume
 400 NASA Climate Change Can you post graphics of i...
 401 Yep! I remember cooler Halloweens!
 402 When will we all agree to just stop burning st...
 403 As soon as possible we should change our lifes...
 404 I wish if I shared this I could also share all...
 405 Erin Haas Brassil check out the Anoka referenc...
 406 Scary!
 407 Our planet, and especially Earth's ecosystems,...
 408 Here is what you need to know about Climate Ch...
 409 What do we do? Congress is negotiating away p...
 410 A good visual representation of those memories...
 411 Jusst Jess
 412 Carbon increases, oxygen decreases.\n\nIs ther...
 413 The industrial revolution was the beginning of...
 414 Woah, NASA had the scariest Halloween post I've...
 415 NASA Climate Change can surely drop the mic no...
 416 At about 8243 B.P., there was a 3C rise in glo...
 417 I am not blaming or deamoning industrializatio...
 418 Give up NASA, internet has liberated its "Goog...
 419 Fact !! During the 1950s houses built in miami...
 420 Thanks for defining 'anomaly' in this context...
 421 The Mother Earth is in sorrow. Can we do somet...
 422 The evidence screams that we're on a collision...
 423 If it is a recurring cycle; why don't we plan ...
 424 So depressing
 425 "Do you remember the famous 97% study - that 9...
 426 As Elizabeth Kolbert said in her book, "The Si...
 427 Too bad we don't see Oct 1821 or 1721, just ke...
 428 Scary! This is a great graphic to remind every...
 429 Wow! 100 years this year! I didn't know that.
 430 Jimmy Valmer
 431 You are a big liar.\nThe Earth is Flat.\nThe W...
 432 Small consolation, but it'll be in the high 60...

433 I can only hope to someday attain the level of...
 434 Great post NASA Climate Change. No doubt the f...
 435 Weather is not climate! Climate allows extreme...
 436 It's amazing that well educated people I know ...
 437 thank you for the research you do, and for sti...
 438 Perhaps there are new lives being born who wil...
 439 It's been getting warmer ever since the end of...
 440 What PPM were the CO2 levels in atmosphere abo...
 441 Do you have another graph for before 1880?I li...
 442 The deniers don't realize that it may be 20 de...
 443 NASA Climate Change how well were climate stat...
 444 Temperature increase was constantly rising up ...
 445 please...NASA Climate Change ...\n ...
 446
 447 How at some stages like 1900 to 1920 temperatu...
 448
 449 The next time you're sitting in bumper to bump...
 450 To those who cite a very cold day as evidence ...
 451 In our area of the country (Pa) a lot of the s...
 452 politicians keep your hands off our scientists...
 453 Funny how every winter after a big blizzard, t...
 454 Men argue. Nature acts.
 455 Never seen loess spelled that way. Must be Ame...
 456 Despite amazing scientific research, not a sin...
 457 How can we bring students who are lacking skil...
 458 You've wrong. It's been warming since the last...
 459 Wow, crazy stats.
 460 How anyone can think we have had no impact on ...
 461 Subir un Grado es demasiado!
 462 So if people are the cause, how do you explain...
 463 Weather is like the clothes you wear on a part...
 464 Pourquoi prendre le mois de décembre ? Ok c'es...
 465 Nous accélérons toujours depuis 1990
 466 Just because NASA can't say #HumanCausedGlobal...
 467 Started with the Industrial Age, 1880's - and ...
 468 For you deniers I'm just going to say this in ...
 469 So many Muppets trying to argue with scientist...
 470 I'll bet they were talking about a global cool...
 471 <https://www.barnesandnoble.com/w/the-great-cli...>
 472 All fake numbers again
 473 Many people do not understand some very basic ...
 474 You people are absolutely nuts
 475 The "greenhouse effect" is concerned with the ...
 476 Is CO2 Earth's Thermostat?\nCarbon dioxide has...
 477 <https://www.facebook.com/reel/3246160055626064/>
 478
 479 Kevin Lay

```

480 Look at this phone case \nbit.ly/3XmDT8c\nWhat...
481                                     emen
482         'Fact'['V-x'[['']]Ray]'y[2']  ' ' '
483                                     This is our fault
484                                     You show em!
485                                     NaN
486                                     Iqbal Badruddin
487                                     A very real concern !!!!
488                                     Someone send this to tRump !!!
489                                     Anneliese Garcia
490 Just like our government denies that there is ...
491 Some people want to leave Mother Earth and col...
492 Imagine working at NASA after a life of study ...
493 Yes, but, the U.S. mean temperature anomaly , ...
494 Oh well at least it's not 1.5c, just 1.44.
495 "The 1.5'C Paris Agreement red line is dead an...
496 I presume this 'burst' of heat is El Nino rela...
497 My fear is keep crying wolf and when the wolf ...
498 A cause de l'activité humaine ..... ' et pourtant ...
499 And this is going to be hottest December on th...
500 A terra não tem 100 anos, nem 1 milhão de anos...
501 In my opinion, there is no such thing as a phy...
502 Waiting for the science illiterates to come te...
503 Gosh if only people had been warning about lit...
504 Deniers simply do not care. I fear us humans h...
505                                     second order trends too.
506 And the destabilization of the polar vortex is...
507 The clue is in the adjective "global" . There...
508 The world's population has been increasing too...
509 Definitely not the case. The last snowy Christ...
510 The only solution is back to nature.
511 Then don't use some very hot days in the summe...
512 Also climate change involves severe weather of...
513 With cold temperatures, ignoring change in alb...
514 Thank you.\nDo you happen to have a global tem...
515 "Ice On Fire" documentary presents a through e...
516 Deniers will continue to be deniers because th...
517 One can only hope for a peak
518 what is the error margin for the temperature e...
519 We all should volenteerly help in reducing Glo...
520 Sergio Yepes
521 We're experiencing severe, abnormal weather pa...
Name: text, dtype: object

```

```

[95]: from sklearn.model_selection import train_test_split
x_train,x_text,y_train,y_test=train_test_split(x,y,test_size=0.3,random_state=
↪=42)

```

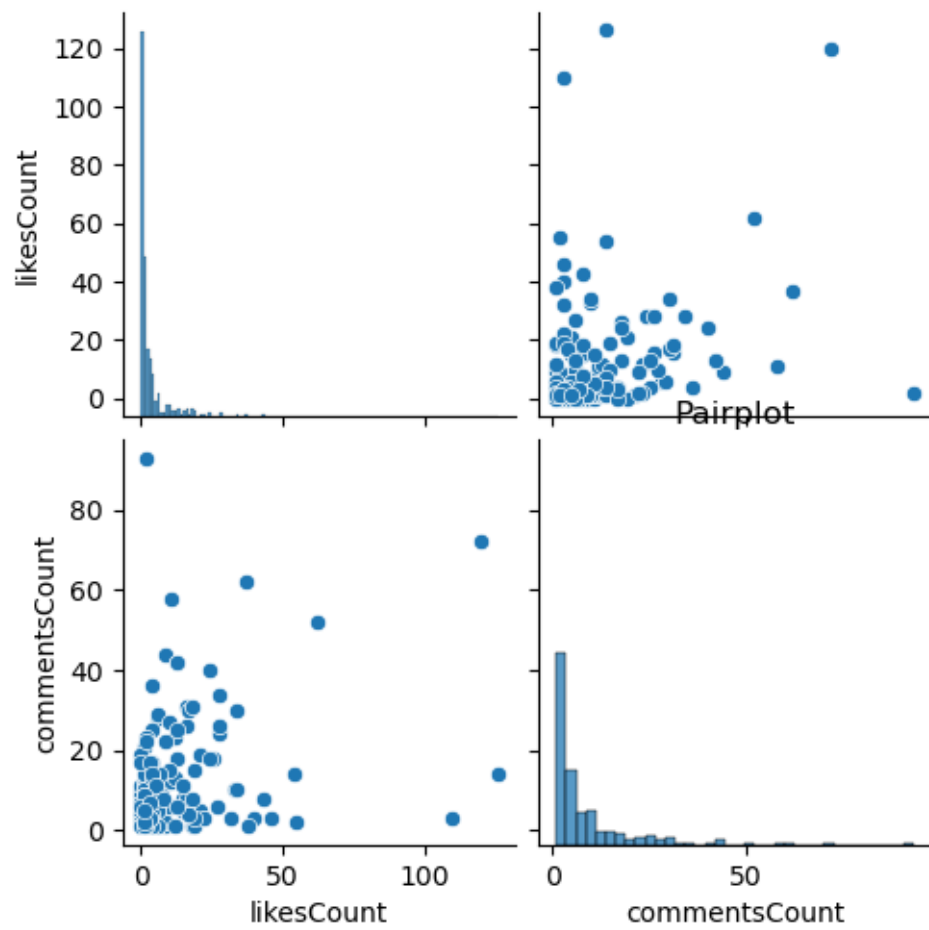
```
[101]: from sklearn.feature_extraction.text import CountVectorizer
corpus = df
vectorizer =CountVectorizer()
X=vectorizer.fit_transform(corpus)
feature_names=vectorizer.get_feature_names_out()
X.array = X.toarray()
print(X.array)
print(feature_names)
```

```
[[1 0]
 [0 1]]
['likescount' 'text']
```

```
[103]: from sklearn.feature_extraction.text import TfidfVectorizer
corpus2=df
vectorizer = TfidfVectorizer()
tfidf_matrix = vectorizer.fit_transform(corpus)
feature_names2 = vectorizer.get_feature_names_out()
tfidf_array =tfidf_matrix.toarray()
print(tfidf_array)
print(feature_names2)
```

```
[[1. 0.]
 [0. 1.]]
['likescount' 'text']
```

```
[105]: sns.pairplot(nasa)
plt.title('Pairplot')
plt.legend
plt.show()
```



[]: