

Climate Change

- [Why I Want Global Warming](#)
- [The US Temperature Record 1: Where is the data?](#)
- [The US Temperature Record 2: Twelve Data Sets](#)
- [The US Temperature Record 3: Stations](#)
- [The US Temperature Record 4: Data Flags](#)
- [The US Temperature Record 5: Preparing the Data](#)
- [The US Temperature Record 6: Extracting annual averages using SQL](#)
- [The US Temperature Record 7: Graphing annual data in Excel](#)
- [The US Temperature Record 8: Choosing a dataset](#)
- [The US Temperature Record 9: Data Cleanup](#)
- [The US Temperature Record 10: The Trends](#)
- [The US Temperature Record 11: RealClimateTools.com](#)
- [More Scientific Fraud Identified](#)
- [The Death of Man-Made Climate Change: the last nail is in the coffin, so why didn't it die?](#)
- [The Return of Natural Philosophy](#)
- [The Stupidity of the Climatists](#)
- [Activist Science](#)

Why I Want Global Warming

/ JUN 04, 2016

Global Warming.

A cause of some consternation for almost everyone. Except me, maybe.

You see, I'll all for it.

I grew up and live in a semi-arid region, where the only plants that grow naturally are few and work hard for anything they produce which is never enough to sustain even one person per square mile. So the lack of plant life around me as I grew up is a big influence on how I see what the future might be.

I want plants to grow. Everywhere. All the time.

Right now, they don't. They only grow in certain places. Places that are wet. Riverbanks. Coastlines. Irrigated land.

Ever look at a vegetation map? Notice the vast yellow expanses where nothing is growing? That's a problem. A big problem.



It didn't used to be that way. There was a time when plants grew on the surface in sufficient abundance that it was difficult to find dirt. Plants grew on top of plants. It is called the *carboniferous* period, and existed about 360 - 300 million years ago. That's when the coal beds were deposited. The plants grew in such abundance that the dead plants were buried before they could decay back into carbon dioxide and water, and became coal. There is a lot of coal below ground, and it all used to be plants.

Here's what I want: to recreate, as best we can, the climate of the carboniferous period:

- Average global temperature: 68 °F. Currently: 56 °F
- Oxygen in the atmosphere: 35%. Currently 21%
- Carbon dioxide levels: 1200 ppm. Currently 410 ppm

Carbon dioxide is the key. We need to put it into the atmosphere, which will let global warming heat the oceans, so water will evaporate and also warm the atmosphere (water is a very good greenhouse gas). Then the plants will grow, and oxygen levels will shoot up. The air will be warmer, so we will be wearing less. And that means we need to lose weight, but that will be easy will an abundance of oxygen to help us work out.

As I see it, global warming is a total win for mankind.

The US Temperature Record 1: Where is the data?

/ SEP 22, 2021

I want to examine the US temperature record honestly. We've all seen the "hockey stick" plot of temperatures. Is it real? I'm a scientist, which means there is a part of me that never believes anything I'm told. I want to know for myself. I hate being dependent on *believing* science. Like a religion. I've already got one, thanks. I'm not keen to adopt any others.

The US climate data repository is kept at the United States Historical Climatology Network (USHCN), <https://www.ncdc.noaa.gov/ushcn/data-access>. It's kept by National Oceanic and Atmospheric Administration (NOAA), and administered by the National Climatology Data Center (NCDC).



The Network is a set of just under 2000 weather stations which were started back in the Civil War times and added to into the 1950's. All were initially sited well, which means a well-ventilated box above the ground over a grassy field with no structures nor pavements nearby to influence the temperature readings. The thermometers they used were recording thermometers, a U-shaped tube with a bulb at the top of one arm with mercury at the bottom, and small bits of plastic riding on the top of the two arms of mercury. When the temperature went down, gas inside the bulb would contract and draw the mercury up that side, and leave the plastic bit clinging to the glass at its high point representing the coldest temperature of the day. When hot the gas expands, pushing the mercury up in the other column, leaving it's bit of plastic high and dry at the hottest part of the day. Someone come out each day to record the hottest and coldest temperature, then knocks the bits back down by tapping the thermometer. Each month the highs and lows are averaged, and the monthly average is calculated. For most purposes, the monthly average is all that is needed to see general weather trends. The USHCN is a list of the average monthly high, low, and daily average temperatures for each station. It also includes precipitation totals for each month.

If you followed the link above, you'll find the link to the FTP site where the data is kept (<https://www.ncei.noaa.gov/pub/data/ushcn/v2.5/>) where you'll be confused. What's up with all

those different temperature sets? That's in [part 2](#).



[EDIT](#) |

The US Temperature Record 2: Twelve Data Sets

/ SEP 22, 2021

At the USHCN [data store](#) there are four measurements, or "elements," available:

- prcp: precipitation totals for each month
- tavg: the monthly average of the daily average temperatures $[(T_{\min} + T_{\max})/2]$
- tmax: the monthly average of the daily high temperatures
- tmin: the monthly average of the daily low temperatures

Question: why is the data stored by monthly average, when we have (at least I have) a weather station reporting the weather to national databases every five minutes? Because that's how it was reported until the 1990's. That's how the data was collected for most of the database existence, and they just kept it going. The data is far easier to gather now: no humans involved in reading, recording and resetting the thermometers each day, no emptying the rain trap, no missed days, no averages to calculate by hand, no reports lost in the mail or not sent. You can get an idea what these monthly reports look like from my weather station NOAA data page [here](#).

And for each, three files, or "datasets," are available:

- raw
- tob
- FLs.52j

Twelve data sets in all, supposedly representing one set of measurements. The trouble is those three types of data. Let's see what they are:

raw:

raw data come directly from the reports received. Thermometer readings as they were reported each month.

tob:

Data which has been corrected for time of observation. If the thermometer was observed at 10 am, T_{\max} represents yesterday's high, while T_{\min} is that morning's low. The tob correction is supposed to correct for that, which should mean very little to the monthly average and almost nothing to the yearly averages as it shifts the days by one. Scientifically I have a big problem with using this data, as they have changed the primary data. You should never do that. You can adjust the model using the data, but data is the only truth we have in science, and holds a special, inviolable place.

FLs.52j:

This is a far more extreme correction, using what is called the "pairwise homogenization algorithm," the PHA. This is an attempt to level off any variation in the monthly temperature series by comparing each station's monthly averages to those of a nearby station. I have a real problem with this fiddling with the data. They are attempting to solve two problems with one correction: variability in the time series (caused by changes in the measuring equipment or housing), and variability in the spatial series (variability in the temperatures recorded by nearby stations the same day, caused by changes in land use around the station, new roads, even tree growth nearby). It's an attempt to remove variability in the data, which is done so it matches the models better. If there is variability in the data, the model should always reflect that variability; only a fool would change the data to make it match the model better. And this dataset is the tenth ("jth") iteration of the version 2.5 algorithm, meaning they got it wrong nine times in a row but still trust the PHA. Most of us walk away from a bad restaurant after one bout of food poisoning; these guys are eating at the same place ten days straight! Someone needs to explain that to me.

The US Temperature Record 3: Stations

/ SEP 22, 2021

Here are the stations used when calculating the contiguous US temperature trends:

Station ID	Lat.	Long.	Alt.(m)	ST Name
USH00011084	31.05	-87.05	25.90	AL BREWTON 3 SSE
USH00012813	30.54	-87.88	7.00	AL FAIRHOPE 2 NE
USH00013160	32.83	-88.13	38.10	AL GAINESVILLE LOCK
USH00013511	32.70	-87.58	67.10	AL GREENSBORO
USH00013816	31.87	-86.25	132.00	AL HIGHLAND HOME
USH00015749	34.74	-87.59	164.60	AL MUSCLE SHOALS AP
USH00017157	34.17	-86.81	243.80	AL SAINT BERNARD
USH00017304	34.67	-86.05	187.50	AL SCOTTSBORO
USH00017366	32.41	-87.01	44.80	AL SELMA
USH00018024	33.41	-86.13	136.60	AL TALLADEGA
USH00018178	31.54	-87.88	118.90	AL THOMASVILLE
USH00018323	31.80	-85.97	165.20	AL TROY
USH00018380	33.21	-87.61	51.50	AL TUSCALOOSA ACFD
USH00018438	32.01	-85.74	134.10	AL UNION SPRINGS 9 S
USH00018469	34.56	-85.61	323.70	AL VALLEY HEAD
USH00020080	32.36	-112.86	539.50	AZ AJO
USH00021026	33.37	-112.58	271.30	AZ BUCKEYE
USH00021248	36.15	-109.53	1709.90	AZ CANYON DE CHELLY
USH00021514	33.20	-111.68	434.30	AZ CHANDLER HEIGHTS
USH00021614	34.34	-111.69	807.70	AZ CHILDS
USH00023160	35.26	-111.74	2239.40	AZ FT VALLEY
USH00023596	36.05	-112.15	2068.10	AZ GRAND CANYON NP 2
USH00024089	34.90	-110.15	1549.90	AZ HOLBROOK
USH00024645	35.20	-114.01	1078.70	AZ KINGMAN #2
USH00024849	36.86	-111.60	978.40	AZ LEES FERRY
USH00025512	33.40	-110.87	1085.10	AZ MIAMI
USH00026250	34.15	-114.28	128.00	AZ PARKER
USH00026353	31.93	-109.83	1325.90	AZ PEARCE SUNSITES
USH00026796	34.57	-112.43	1586.50	AZ PRESCOTT
USH00027281	33.67	-111.15	672.10	AZ ROOSEVELT 1 WNW
USH00027370	33.08	-111.74	391.70	AZ SACATON
USH00027390	32.81	-109.68	900.40	AZ SAFFORD AGRICULTRL CTR
USH00027435	34.51	-109.40	1764.80	AZ SAINT JOHNS
USH00027716	35.33	-112.87	1600.20	AZ SELIGMAN
USH00028619	31.70	-110.05	1405.10	AZ TOMBSTONE
USH00028815	32.22	-110.95	742.20	AZ TUCSON WFO
USH00029271	33.81	-109.98	1560.60	AZ WHITERIVER 1 SW
USH00029287	33.97	-112.74	638.60	AZ WICKENBURG
USH00029359	35.24	-112.19	2057.40	AZ WILLIAMS
USH00029652	32.61	-114.63	58.20	AZ YUMA CITRUS STN

USH00030936	34.88	-91.21	56.40	AR BRINKLEY
USH00031596	35.08	-92.42	96.00	AR CONWAY
USH00031632	36.41	-90.58	91.40	AR CORNING
USH00032356	36.41	-93.79	432.80	AR EUREKA SPRINGS 3 WNW
USH00032444	36.10	-94.17	387.10	AR FAYETTEVILLE EXP STN
USH00032930	36.42	-94.44	384.00	AR GRAVETTE
USH00034572	36.49	-91.53	153.00	AR MAMMOTH SPRING
USH00034756	34.57	-94.24	344.40	AR MENA
USH00035186	35.60	-91.27	69.50	AR NEWPORT
USH00035512	35.51	-93.86	253.00	AR OZARK 2
USH00035754	34.22	-92.01	65.50	AR PINE BLUFF
USH00035820	36.26	-90.96	96.00	AR POCAHONTAS 1
USH00035908	33.82	-93.38	93.90	AR PRESCOTT 2 NNW
USH00036253	33.81	-91.27	45.70	AR ROHWER 2 NNE
USH00036928	35.30	-93.63	152.40	AR SUBIACO
USH00040693	37.87	-122.25	94.50	CA BERKELEY
USH00040924	33.61	-114.59	81.70	CA BLYTHE
USH00041048	32.95	-115.55	-30.50	CA BRAWLEY 2 SW
USH00041614	41.53	-120.17	1423.40	CA CEDARVILLE
USH00041715	39.69	-121.82	56.40	CA CHICO UNIV FARM
USH00041758	32.64	-117.08	17.10	CA CHULA VISTA
USH00041912	39.09	-120.94	725.40	CA COLFAX
USH00042239	32.98	-116.58	1414.30	CA CUYAMACA
USH00042294	38.53	-121.77	18.30	CA DAVIS 2 WSW EXP
USH00042319	36.46	-116.86	-59.10	CA DEATH VALLEY
USH00042728	38.33	-120.67	217.90	CA ELECTRA P H
USH00042910	40.80	-124.16	6.10	CA EUREKA WFO WOODLEY IS
USH00042941	34.70	-118.42	932.70	CA FAIRMONT
USH00043161	39.50	-123.75	37.50	CA FT BRAGG 5 N
USH00043257	36.78	-119.71	101.50	CA FRESNO YOSEMITE AP
USH00043747	36.32	-119.63	74.70	CA HANFORD 1 S
USH00043761	41.80	-123.37	341.40	CA HAPPY CAMP RS
USH00043875	38.61	-122.87	32.90	CA HEALDSBURG
USH00044232	36.79	-118.20	1204.00	CA INDEPENDENCE
USH00044259	33.70	-116.21	-6.40	CA INDIO FIRE STN
USH00044713	39.31	-120.63	1571.50	CA LAKE SPAULDING
USH00044890	36.38	-119.02	156.40	CA LEMON COVE
USH00044997	37.69	-121.76	146.30	CA LIVERMORE
USH00045032	38.10	-121.28	12.20	CA LODI
USH00045385	39.14	-121.58	17.40	CA MARYSVILLE
USH00045532	37.28	-120.51	46.60	CA MERCED
USH00045983	41.32	-122.30	1094.20	CA MT SHASTA
USH00046074	38.27	-122.26	10.70	CA NAPA STATE HOSPITAL
USH00046118	34.76	-114.61	271.30	CA NEEDLES AP
USH00046175	33.60	-117.88	3.00	CA NEWPORT BEACH HARBOR
USH00046399	34.44	-119.22	227.10	CA OJAI
USH00046506	39.74	-122.19	77.40	CA ORLAND
USH00046508	41.30	-123.53	122.80	CA ORLEANS
USH00046719	34.14	-118.14	263.30	CA PASADENA
USH00046730	35.62	-120.68	213.40	CA PASO ROBLES
USH00046826	38.25	-122.60	6.10	CA PETALUMA AP
USH00047195	39.93	-120.94	1042.40	CA QUINCY
USH00047304	40.51	-122.29	151.50	CA REDDING MUNI AP

USH00047306	34.05	-117.18	401.70	CA REDLANDS
USH00047851	35.30	-120.66	96.00	CA SAN LUIS OBISPO POLY
USH00047902	34.41	-119.68	1.50	CA SANTA BARBARA
USH00047916	36.99	-121.99	39.60	CA SANTA CRUZ
USH00047965	38.43	-122.69	53.00	CA SANTA ROSA
USH00048702	40.41	-120.66	1275.30	CA SUSANVILLE 2SW
USH00048758	39.16	-120.14	1898.90	CA TAHOE CITY
USH00048839	35.02	-118.74	434.30	CA TEJON RANCHO
USH00049087	33.70	-117.75	71.60	CA TUSTIN IRVINE RCH
USH00049122	39.14	-123.21	193.90	CA UKIAH
USH00049200	38.39	-121.96	33.50	CA VACAVILLE
USH00049452	35.59	-119.35	105.20	CA WASCO
USH00049490	40.72	-122.93	599.80	CA WEAVERVILLE
USH00049699	39.52	-122.30	71.00	CA WILLOWS 6 W
USH00049855	37.75	-119.58	1224.70	CA YOSEMITE PARK HQ
USH00049866	41.70	-122.64	800.10	CA YREKA
USH00050848	39.99	-105.26	1671.50	CO BOULDER
USH00051294	38.46	-105.22	1635.60	CO CANON CITY
USH00051528	39.22	-105.27	2097.00	CO CHEESMAN
USH00051564	38.82	-102.34	1295.40	CO CHEYENNE WELLS
USH00051741	39.24	-107.96	1822.70	CO COLLBRAN
USH00052184	37.67	-106.32	2396.90	CO DEL NORTE 2E
USH00052281	39.62	-106.03	2763.00	CO DILLON 1 E
USH00052446	38.47	-102.78	1284.70	CO EADS
USH00053005	40.61	-105.13	1525.20	CO FT COLLINS
USH00053038	40.26	-103.81	1328.60	CO FT MORGAN
USH00053146	39.16	-108.73	1378.90	CO FRUITA
USH00053662	38.52	-106.96	2323.80	CO GUNNISON 3SW
USH00053951	37.77	-107.10	2757.80	CO HERMIT 7 ESE
USH00054076	38.04	-102.12	1033.30	CO HOLLY
USH00054770	38.09	-102.63	1105.50	CO LAMAR
USH00054834	38.06	-103.21	1185.70	CO LAS ANIMAS
USH00055322	37.17	-105.93	2343.90	CO MANASSA
USH00055722	38.48	-107.87	1764.50	CO MONTROSE #2
USH00057167	38.03	-103.69	1271.00	CO ROCKY FORD 2 SE
USH00057337	38.08	-106.14	2347.30	CO SAGUACHE
USH00057936	40.48	-106.82	2094.00	CO STEAMBOAT SPRINGS
USH00058204	37.94	-107.87	2643.20	CO TELLURIDE 4WNW
USH00058429	37.17	-104.48	1837.90	CO TRINIDAD
USH00059243	40.05	-102.21	1121.70	CO WRAY
USH00062658	41.95	-73.36	167.60	CT FALLS VILLAGE
USH00063207	41.35	-72.03	12.20	CT GROTON
USH00067970	41.12	-73.54	57.90	CT STAMFORD 5 N
USH00068138	41.79	-72.22	198.10	CT STORRS
USH00072730	39.25	-75.51	9.10	DE DOVER
USH00073595	38.81	-75.57	13.70	DE GREENWOOD 2NE
USH00075915	38.89	-75.42	10.70	DE MILFORD 2 SE
USH00076410	39.66	-75.75	27.40	DE NEWARK UNIV FARM
USH00079605	39.77	-75.54	82.30	DE WILMINGTON PORTER RES
USH00080211	29.72	-85.02	6.10	FL APALACHICOLA AP
USH00080228	27.21	-81.87	9.10	FL ARCADIA
USH00080478	27.89	-81.84	38.10	FL BARTOW
USH00080611	26.69	-80.67	6.10	FL BELLE GLADE

USH00082220	30.72	-86.09	74.70	FL DE FUNIAK SPRINGS 1
USH00082850	25.84	-81.38	1.50	FL EVERGLADES
USH00082915	29.75	-81.53	1.50	FL FEDERAL POINT
USH00082944	30.65	-81.46	4.00	FL FERNANDINA BEACH
USH00083163	26.10	-80.20	4.90	FL FT LAUDERDALE
USH00083186	26.58	-81.86	4.60	FL FT MYERS PAGE FLD
USH00083207	27.46	-80.35	7.60	FL FT PIERCE
USH00084289	28.80	-82.31	12.20	FL INVERNESS 3 SE
USH00084570	24.55	-81.75	1.20	FL KEY WEST INTL AP
USH00084731	30.18	-82.59	59.40	FL LAKE CITY 2 E
USH00085275	30.45	-83.41	36.60	FL MADISON
USH00086414	29.08	-82.07	22.90	FL OCALA
USH00086997	30.47	-87.18	34.10	FL PENSACOLA RGNL AP
USH00087020	25.58	-80.43	3.00	FL PERRINE 4W
USH00087851	28.33	-82.26	57.90	FL SAINT LEO
USH00088758	30.39	-84.35	16.80	FL TALLAHASSEE WSO AP
USH00088824	28.15	-82.76	2.40	FL TARPON SPGS SEWAGE PL
USH00088942	28.62	-80.81	1.50	FL TITUSVILLE
USH00090140	31.53	-84.14	54.90	GA ALBANY 3 SE
USH00090586	30.82	-84.61	57.90	GA BAINBRIDGE INTL PAPER
USH00091340	31.16	-81.50	4.00	GA BRUNSWICK
USH00091500	31.19	-84.20	53.30	GA CAMILLA 3SE
USH00092318	33.59	-83.84	234.40	GA COVINGTON
USH00092475	34.52	-83.99	475.50	GA DAHLONEGA
USH00092966	32.20	-83.20	121.90	GA EASTMAN 1 W
USH00093621	34.30	-83.86	356.60	GA GAINESVILLE
USH00093754	31.98	-81.95	61.00	GA GLENNVILLE 3NW
USH00094170	33.28	-83.46	74.70	GA HAWKINSVILLE
USH00095874	33.08	-83.24	112.20	GA MILLEDGEVILLE
USH00095882	32.87	-81.96	59.40	GA MILLEN 4 N
USH00096335	33.45	-84.81	272.50	GA NEWNAN 5N
USH00097276	30.78	-83.56	56.40	GA QUITMAN 2 NW
USH00097600	34.24	-85.15	200.90	GA ROME
USH00097847	32.13	-81.21	14.00	GA SAVANNAH INTL AP
USH00098535	32.68	-84.51	195.10	GA TALBOTTON
USH00098703	31.44	-83.47	115.80	GA TIFTON
USH00098740	34.57	-83.33	308.50	GA TOCCOA
USH00099141	33.40	-82.62	149.40	GA WARRENTON
USH00099157	33.72	-82.70	189.00	GA WASHINGTON 2 ESE
USH00099186	31.25	-82.31	44.20	GA WAYCROSS 4 NE
USH00099291	32.86	-85.18	175.30	GA WEST POINT
USH00100010	42.95	-112.82	1342.60	ID ABERDEEN EXP STN
USH00100448	43.59	-115.92	986.00	ID ARROWROCK DAM
USH00100470	44.04	-111.27	1588.60	ID ASHTON 1N
USH00100803	42.33	-111.38	1817.80	ID BERN
USH00101408	44.57	-116.67	807.70	ID CAMBRIDGE
USH00101956	47.67	-116.80	650.10	ID COEUR D'ALENE
USH00102845	46.50	-116.32	303.30	ID DWORSHAK FISH HATCHERY
USH00103143	46.09	-115.53	475.50	ID FENN RS
USH00103631	42.94	-115.32	751.60	ID GLENNS FERRY
USH00103732	42.58	-111.72	1691.60	ID GRACE
USH00104140	42.59	-114.13	1237.50	ID HAZELTON
USH00104295	42.35	-114.57	1379.20	ID HOLLISTER

USH00104670	42.73	-114.51	1140.00	ID JEROME
USH00104831	47.53	-116.12	707.10	ID KELLOGG
USH00104845	43.68	-114.36	1795.30	ID KETCHUM RS
USH00105241	46.37	-117.01	437.70	ID LEWISTON AP
USH00105275	42.12	-111.31	1806.20	ID LIFTON PUMPING STN
USH00105462	43.91	-113.63	1797.40	ID MACKAY LOST RIVER RS
USH00105559	42.14	-112.28	1362.50	ID MALAD CITY
USH00105685	44.56	-113.89	1539.20	ID MAY 2SSE
USH00106152	46.72	-116.96	810.80	ID MOSCOW U OF I
USH00106305	43.60	-116.57	752.90	ID NAMPA SUGAR FACTORY
USH00106388	44.96	-116.28	1179.60	ID NEW MEADOWS RS
USH00106542	42.23	-113.89	1389.60	ID OAKLEY
USH00106891	44.07	-116.92	655.30	ID PAYETTE
USH00107264	48.99	-116.50	541.00	ID PORTHILL
USH00107386	48.35	-116.83	725.40	ID PRIEST RIVER EXP STN
USH00108080	45.18	-113.90	1198.20	ID SALMON-KSRA
USH00108137	48.29	-116.55	640.10	ID SANDPOINT EXP STN
USH00110072	41.19	-90.74	219.50	IL ALEDO
USH00110187	37.48	-89.23	195.10	IL ANNA 2 NNE
USH00110338	41.78	-88.30	201.20	IL AURORA
USH00111280	39.28	-89.87	189.30	IL CARLINVILLE
USH00111436	39.47	-88.16	198.10	IL CHARLESTON
USH00112140	40.13	-87.64	170.10	IL DANVILLE
USH00112193	39.82	-88.95	189.00	IL DECATUR WTP
USH00112348	41.84	-89.50	213.40	IL DIXON 1 NW
USH00112483	37.98	-89.19	128.00	IL DU QUOIN 4 SE
USH00113335	41.17	-90.03	246.90	IL GALVA
USH00113879	37.74	-88.52	111.30	IL HARRISBURG
USH00114108	39.15	-89.48	192.00	IL HILLSBORO
USH00114198	40.47	-87.65	216.40	IL HOOPESTON 1 NE
USH00114442	39.73	-90.19	185.90	IL JACKSONVILLE 2E
USH00114823	40.58	-90.96	210.30	IL LA HARPE
USH00115079	40.15	-89.33	177.70	IL LINCOLN
USH00115326	42.29	-88.64	248.40	IL MARENGO
USH00115515	38.08	-88.54	135.90	IL MCLEANSBORO
USH00115712	40.91	-89.03	228.60	IL MINONK
USH00115768	40.92	-90.63	227.10	IL MONMOUTH
USH00115833	41.80	-89.97	183.80	IL MORRISON
USH00115901	42.09	-89.98	195.10	IL MT CARROLL
USH00115943	38.34	-88.85	149.40	IL MT VERNON 3 NE
USH00116446	38.70	-88.08	146.30	IL OLNEY 2S
USH00116526	41.32	-88.91	160.00	IL OTTAWA 5SW
USH00116558	39.00	-87.62	140.20	IL PALESTINE
USH00116579	39.37	-89.02	213.40	IL PANA 3E
USH00116610	39.63	-87.69	207.30	IL PARIS WTR WKS
USH00116738	39.80	-90.82	198.10	IL PERRY 6 NW
USH00116910	40.88	-88.63	198.10	IL PONTIAC
USH00117551	40.11	-90.56	201.20	IL RUSHVILLE
USH00118147	38.11	-89.71	163.10	IL SPARTA 1 W
USH00118740	40.08	-88.24	219.80	IL URBANA
USH00118916	41.55	-89.59	210.30	IL WALNUT
USH00119241	39.44	-90.37	176.80	IL WHITE HALL 1 E
USH00119354	39.43	-88.59	210.30	IL WINDSOR

USH00120177	40.11	-85.71	257.60	IN ANDERSON SEWAGE PLT
USH00120200	41.63	-84.98	307.80	IN ANGOLA
USH00120676	40.66	-84.93	265.20	IN BERNE WWTP
USH00120784	39.17	-86.52	253.00	IN BLOOMINGTON IN UNIV
USH00121030	39.42	-85.01	192.00	IN BROOKVILLE
USH00121229	39.86	-85.18	304.80	IN CAMBRIDGE CITY 3 N
USH00121425	38.48	-85.70	167.60	IN CHARLESTOWN 5 NNW
USH00121747	39.19	-85.92	189.30	IN COLUMBUS
USH00121873	40.00	-86.80	256.00	IN CRAWFORDSVILLE 6 SE
USH00122149	40.61	-86.66	169.50	IN DELPHI 2 N
USH00123418	41.55	-85.88	266.70	IN GOSHEN 3SW
USH00123513	39.64	-86.87	224.00	IN GREENCASTLE 1 W
USH00123527	39.78	-85.76	263.70	IN GREENFIELD
USH00124008	41.54	-87.28	195.10	IN HOBART 2 WNW
USH00124181	40.85	-85.49	221.00	IN HUNTINGTON
USH00124837	41.61	-86.72	257.60	IN LAPORTE
USH00125237	38.73	-85.39	140.20	IN MADISON SEWAGE PLT
USH00125337	40.58	-85.65	240.80	IN MARION 2 N
USH00126001	37.92	-87.89	108.80	IN MT VERNON
USH00126580	38.88	-86.55	198.10	IN OOLITIC PURDUE EX FRM
USH00126705	38.55	-86.48	170.70	IN PAOLI
USH00127125	38.35	-87.59	146.30	IN PRINCETON 1 W
USH00127298	40.93	-87.15	198.10	IN RENSSELAER
USH00127482	41.06	-86.20	234.70	IN ROCHESTER
USH00127522	39.75	-87.22	211.20	IN ROCKVILLE
USH00127646	39.60	-85.45	292.60	IN RUSHVILLE
USH00127755	38.61	-86.08	243.80	IN SALEM
USH00127875	38.68	-85.78	173.70	IN SCOTTSBURG
USH00127935	38.98	-85.98	173.70	IN SEYMOUR 2 N
USH00128036	38.55	-86.79	154.20	IN SHOALS 8 S
USH00129080	38.74	-85.07	150.90	IN VEVAY
USH00129113	38.73	-87.48	137.20	IN VINCENNES 5 NE
USH00129253	38.64	-87.19	152.40	IN WASHINGTON 1 W
USH00129511	41.19	-87.05	202.70	IN WHEATFIELD
USH00129557	39.99	-86.35	289.00	IN WHITESTOWN
USH00129670	41.02	-86.58	210.30	IN WINAMAC 2SSE
USH00130112	41.06	-92.78	268.20	IA ALBIA 3 NNE
USH00130133	43.06	-94.30	377.60	IA ALGONA 3 W
USH00130600	41.88	-92.27	246.90	IA BELLE PLAINE
USH00131402	43.07	-92.67	309.10	IA CHARLES CITY
USH00131533	40.72	-95.01	298.70	IA CLARINDA
USH00131635	41.79	-90.26	178.30	IA CLINTON #1
USH00132724	43.43	-94.82	396.80	IA ESTHERVILLE 2 N
USH00132789	41.02	-91.95	225.60	IA FAIRFIELD
USH00132864	42.85	-91.81	344.40	IA FAYETTE
USH00132977	43.28	-93.63	396.20	IA FOREST CITY 2 NNE
USH00132999	42.58	-94.20	347.50	IA FORT DODGE 5NNW
USH00134063	41.36	-93.64	287.10	IA INDIANOLA 2W
USH00134142	42.51	-93.25	344.40	IA IOWA FALLS
USH00134735	42.78	-96.14	364.20	IA LE MARS
USH00134894	41.63	-95.78	301.80	IA LOGAN
USH00135769	40.70	-94.24	359.70	IA MT AYR
USH00135796	40.94	-91.56	222.50	IA MT PLEASANT 1 SSW

USH00135952	43.04	-92.31	349.90	IA NEW HAMPTON
USH00137147	43.43	-96.16	411.50	IA ROCK RAPIDS
USH00137161	42.39	-94.62	364.20	IA ROCKWELL CITY
USH00137979	42.63	-95.16	434.30	IA STORM LAKE 2 E
USH00138296	42.03	-92.58	289.30	IA TOLEDO 3N
USH00138688	41.28	-91.70	210.30	IA WASHINGTON
USH00140264	37.15	-98.02	408.40	KS ANTHONY
USH00140365	37.19	-99.76	600.50	KS ASHLAND
USH00140405	39.57	-95.11	288.00	KS ATCHISON
USH00141704	37.27	-99.32	634.90	KS COLDWATER
USH00141740	37.17	-94.83	275.80	KS COLUMBUS
USH00141867	38.67	-96.50	402.30	KS COUNCIL GROVE LAKE
USH00142401	37.81	-96.84	393.20	KS EL DORADO
USH00142459	38.72	-98.22	466.30	KS ELLSWORTH
USH00142835	37.84	-94.70	257.60	KS FT SCOTT
USH00143527	38.85	-99.33	612.60	KS HAYS 1 S
USH00143810	39.67	-95.52	313.90	KS HORTON
USH00143954	37.23	-95.70	245.40	KS INDEPENDENCE
USH00144087	38.19	-99.91	740.70	KS JETMORE 8NNW
USH00144464	37.94	-101.24	913.80	KS LAKIN
USH00144530	38.18	-99.09	608.10	KS LARNED
USH00144559	38.95	-95.25	306.30	KS LAWRENCE
USH00144588	39.32	-94.91	265.20	KS LEAVENWORTH
USH00144695	37.02	-100.92	863.80	KS LIBERAL
USH00144972	39.19	-96.58	324.60	KS MANHATTAN
USH00145152	38.37	-97.60	463.30	KS MCPHERSON
USH00145173	37.27	-98.58	448.10	KS MEDICINE LODGE
USH00145363	39.12	-97.70	402.90	KS MINNEAPOLIS
USH00145856	39.74	-99.83	719.30	KS NORTON 9SSE
USH00145906	39.81	-100.53	795.50	KS OBERLIN
USH00145972	38.88	-94.76	321.60	KS OLATHE 3E
USH00146128	38.61	-95.28	280.10	KS OTTAWA
USH00147093	39.76	-101.80	1024.70	KS SAINT FRANCIS
USH00147271	38.48	-100.91	905.30	KS SCOTT CITY
USH00147305	37.13	-96.18	274.30	KS SEDAN
USH00147542	39.77	-98.77	542.50	KS SMITH CTR
USH00148495	39.02	-99.88	749.80	KS WAKEENEY
USH00150254	38.45	-82.61	170.70	KY ASHLAND
USH00150381	36.88	-83.88	301.80	KY BARBOURVILLE
USH00150619	37.57	-84.29	326.10	KY BEREA COLLEGE
USH00150909	36.96	-86.42	160.90	KY BOWLING GREEN RGNL AP
USH00152791	38.11	-83.55	207.30	KY FARMERS 2 S
USH00153028	38.20	-84.88	140.80	KY FRANKFORT DOWNTOWN
USH00153430	37.25	-85.50	179.80	KY GREENSBURG
USH00153762	37.75	-87.64	136.90	KY HENDERSON 8 SSW
USH00153994	36.84	-87.52	158.50	KY HOPKINSVILLE
USH00154703	37.51	-86.28	189.00	KY LEITCHFIELD 2 N
USH00157324	38.20	-85.20	222.50	KY SHELBYVILLE 1 E
USH00158709	36.73	-84.15	286.50	KY WILLIAMSBURG
USH00158714	38.65	-84.61	286.50	KY WILLIAMSTOWN 3 W
USH00160098	31.32	-92.46	26.50	LA ALEXANDRIA
USH00160205	30.70	-90.52	51.80	LA AMITE
USH00160537	32.76	-92.00	45.70	LA BASTROP

USH00160549	30.53	-91.14	19.50	LA BATON ROUGE METRO AP
USH00161287	30.95	-92.17	24.40	LA BUNKIE
USH00161411	32.51	-92.34	54.90	LA CALHOUN RSCH STN
USH00162151	30.52	-90.11	12.20	LA COVINGTON 4 NNW
USH00162534	30.07	-91.02	9.10	LA DONALDSONVILLE 4 SW
USH00163313	29.82	-91.54	3.70	LA FRANKLIN 3 NW
USH00163800	30.41	-92.04	16.80	LA GRAND COTEAU
USH00164407	29.58	-90.73	4.60	LA HOUMA
USH00164700	30.20	-92.66	7.60	LA JENNINGS
USH00165026	30.20	-91.98	11.60	LA LAFAYETTE FCWOS
USH00166664	29.91	-90.13	6.10	LA NEW ORLEANS AUDUBON
USH00167344	32.90	-93.79	88.40	LA PLAIN DEALING 4 W
USH00168163	31.94	-91.23	23.80	LA ST JOSEPH 3 N
USH00169013	29.77	-90.78	4.60	LA THIBODAUX 3 ESE
USH00169806	32.09	-91.70	24.40	LA WINNSBORO 5 SSE
USH00170100	44.37	-68.25	143.30	ME ACADIA NP
USH00170814	45.66	-69.81	323.10	ME BRASSUA DAM
USH00171628	44.91	-69.24	90.50	ME CORINNA
USH00172426	44.90	-66.99	25.90	ME EASTPORT
USH00172765	44.68	-70.15	128.00	ME FARMINGTON
USH00173046	44.22	-69.78	42.70	ME GARDINER
USH00173944	46.20	-67.84	118.90	ME HOULTON 5N
USH00174566	44.10	-70.21	54.90	ME LEWISTON
USH00175304	45.65	-68.70	109.70	ME MILLINOCKET
USH00176905	43.64	-70.30	13.70	ME PORTLAND JETPORT
USH00176937	46.65	-68.00	182.60	ME PRESQUE ISLE
USH00179891	45.15	-67.40	42.70	ME WOODLAND
USH00180700	39.03	-76.93	44.20	MD BELTSVILLE
USH00181385	38.56	-76.06	3.00	MD CAMBRIDGE WATER TRMT P
USH00181750	39.21	-76.05	12.20	MD CHESTERTOWN
USH00182282	39.64	-78.75	222.50	MD CUMBERLAND 2
USH00182523	38.88	-75.80	14.90	MD DENTON 2 E
USH00183675	38.96	-76.80	45.70	MD GLENN DALE BELL STN
USH00185111	39.08	-76.90	121.90	MD LAUREL 3 W
USH00185718	39.28	-76.61	6.10	MD MD SCI CTR BALTIMORE
USH00185985	39.27	-75.87	9.10	MD MILLINGTON 1 SE
USH00186620	39.41	-79.40	737.60	MD OAKLAND 1 SE
USH00186770	38.68	-76.66	48.80	MD OWINGS FERRY LANDING
USH00187330	38.21	-75.68	6.10	MD PRINCESS ANNE
USH00187806	38.71	-76.18	3.00	MD ROYAL OAK 2 SSW
USH00188000	38.36	-75.58	3.00	MD SALISBURY
USH00189440	39.55	-76.96	233.20	MD WESTMINSTER POL BRKS
USH00189750	39.33	-76.86	140.20	MD WOODSTOCK
USH00190120	42.38	-72.53	45.70	MA AMHERST
USH00190535	42.48	-71.28	48.80	MA BEDFORD
USH00190736	42.21	-71.11	192.00	MA BLUE HILL
USH00193213	42.14	-73.41	249.00	MA GREAT BARRINGTON 5 SW
USH00194105	42.69	-71.16	15.20	MA LAWRENCE
USH00195246	41.63	-70.93	21.30	MA NEW BEDFORD
USH00196486	41.98	-70.69	13.70	MA PLYMOUTH-KINGSTON
USH00196681	42.05	-70.18	6.10	MA PROVINCETOWN
USH00196783	42.52	-71.12	27.40	MA READING
USH00198367	41.90	-71.06	6.10	MA TAUNTON

USH00198757	42.16	-71.24	50.30	MA WALPOLE 2
USH00199316	42.13	-71.43	64.00	MA WEST MEDWAY
USH00200032	41.91	-84.01	231.60	MI ADRIAN 2 NNE
USH00200128	42.58	-85.78	228.60	MI ALLEGAN 5NE
USH00200146	43.38	-84.64	224.00	MI ALMA
USH00200230	42.29	-83.71	274.30	MI ANN ARBOR U OF
USH00200779	43.70	-85.48	283.50	MI BIG RAPIDS WTR WKS
USH00201439	46.51	-87.98	487.40	MI CHAMPION VAN RIPER PK
USH00201486	46.34	-86.92	265.20	MI CHATHAM EXP FARM 2
USH00201492	45.65	-84.47	179.20	MI CHEBOYGAN
USH00201675	41.96	-84.99	299.90	MI COLDWATER ST SCHOOL
USH00202423	44.28	-83.50	178.60	MI EAST TAWAS
USH00202737	45.66	-86.71	227.10	MI FAYETTE 4 SW
USH00203632	43.67	-86.42	234.70	MI HART 3 WSW
USH00203823	41.93	-84.64	329.20	MI HILLSDALE
USH00204090	45.78	-88.08	326.40	MI IRON MT KINGSFORD WWTP
USH00204104	46.46	-90.18	435.90	MI IRONWOOD
USH00204244	42.28	-85.60	289.60	MI KALAMAZOO STATE HOSP
USH00205434	43.60	-84.20	195.10	MI MIDLAND
USH00205650	42.60	-82.81	176.80	MI MT CLEMENS ANG BASE
USH00205662	43.58	-84.76	242.60	MI MT PLEASANT UNIV
USH00205690	46.41	-86.66	207.30	MI MUNISING
USH00205816	46.31	-85.51	259.10	MI NEWBERRY 3S
USH00206300	43.01	-84.18	222.50	MI OWOSSO WWTP
USH00207690	42.40	-86.28	189.00	MI SOUTH HAVEN
USH00207812	46.05	-88.62	442.00	MI STAMBAUGH 2SSE
USH00210018	47.29	-96.51	276.50	MN ADA
USH00210075	43.60	-93.30	374.90	MN ALBERT LEA 3 SE
USH00210252	48.33	-96.82	258.20	MN ARGYLE
USH00210515	48.70	-94.58	323.70	MN BAUDETTE
USH00211465	44.80	-93.58	219.50	MN CHASKA
USH00211630	46.70	-92.52	385.60	MN CLOQUET
USH00212142	46.83	-95.83	413.00	MN DETROIT LAKES 1 NNE
USH00212645	47.45	-92.53	440.40	MN EVELETH WWTP
USH00212698	43.64	-94.46	361.80	MN FAIRMONT
USH00212737	44.66	-93.17	298.70	MN FARMINGTON 3 NW
USH00212916	47.56	-95.72	399.30	MN FOSSTON 1 E
USH00213290	43.70	-92.56	411.50	MN GRAND MEADOW
USH00213303	47.24	-93.49	399.30	MN GRAND RPDS FOREST LAB
USH00214106	47.22	-95.19	454.20	MN ITASCA UNIV OF MINN
USH00214652	47.24	-94.22	396.80	MN LEECH LAKE
USH00215175	47.63	-93.65	422.80	MN MARCELL 5NE
USH00215400	45.12	-95.92	310.90	MN MILAN 1 NW
USH00215435	44.88	-93.22	265.80	MN MINNEAPOLIS/ST PAUL AP
USH00215563	44.93	-95.75	300.20	MN MONTEVIDEO 1 SW
USH00215615	45.87	-93.31	310.30	MN MORA
USH00215638	45.59	-95.87	347.50	MN MORRIS WC EXP STN
USH00215887	44.30	-94.48	271.30	MN NEW ULM 2 SE
USH00216152	44.76	-94.92	335.30	MN OLIVIA 3E
USH00216360	46.90	-95.06	437.10	MN PARK RAPIDS 2 S
USH00216547	46.66	-94.10	381.00	MN PINE RIVER DAM
USH00216565	44.01	-96.32	519.70	MN PIPESTONE
USH00217087	48.84	-95.76	319.10	MN ROSEAU

USH00217405	44.32	-93.96	259.10	MN ST PETER
USH00217460	46.79	-93.32	376.10	MN SANDY LAKE DAM LIBBY
USH00218419	47.02	-91.66	190.50	MN TWO HARBORS
USH00218618	47.07	-94.57	429.80	MN WALKER AH GWAH CHING
USH00219046	43.76	-94.18	338.30	MN WINNEBAGO
USH00219249	44.29	-92.66	300.20	MN ZUMBROTA
USH00220021	33.83	-88.52	60.40	MS ABERDEEN
USH00220488	34.30	-89.98	67.10	MS BATESVILLE 2 SW
USH00220955	34.66	-88.57	149.40	MS BOONEVILLE
USH00221094	31.54	-90.45	132.60	MS BROOKHAVEN CITY
USH00221389	32.67	-90.03	76.20	MS CANTON 4N
USH00221707	34.18	-90.55	52.70	MS CLARKSDALE
USH00221865	31.25	-89.83	45.70	MS COLUMBIA
USH00221880	33.46	-88.38	44.20	MS COLUMBUS
USH00221962	34.87	-88.61	117.30	MS CORINTH 7 SW
USH00222094	31.94	-90.37	148.40	MS CRYSTAL SPGS EXP STN
USH00223107	32.36	-89.42	137.20	MS FOREST
USH00223605	33.35	-91.06	38.10	MS GREENVILLE
USH00223887	31.25	-89.33	117.30	MS HATTIESBURG 5SW
USH00223975	34.81	-89.98	115.80	MS HERNANDO
USH00224173	34.82	-89.43	147.20	MS HOLLY SPRINGS 4 N
USH00224776	33.05	-89.57	125.00	MS KOSCIUSKO
USH00224939	31.67	-89.12	68.60	MS LAUREL
USH00225247	33.13	-89.07	177.10	MS LOUISVILLE
USH00225987	31.55	-90.10	58.20	MS MONTICELLO
USH00226009	33.45	-90.50	35.70	MS MOORHEAD
USH00226177	31.58	-91.34	59.40	MS NATCHEZ
USH00226718	30.39	-88.47	3.70	MS PASCAGOULA 3 NE
USH00227111	34.13	-88.99	123.40	MS PONTOTOC EXP STN
USH00227128	30.84	-89.54	95.40	MS POPLARVILLE EXP STN
USH00227132	31.98	-90.97	36.60	MS PORT GIBSON 1 NE
USH00228374	33.46	-88.78	56.40	MS STATE UNIV
USH00229079	34.38	-89.53	124.40	MS UNIVERSITY
USH00229400	34.15	-89.63	94.50	MS WATER VALLEY
USH00229426	30.29	-89.38	2.40	MS WAVELAND
USH00229439	31.67	-88.67	61.00	MS WAYNESBORO 2 W
USH00229793	31.09	-91.23	121.90	MS WOODVILLE 4 ESE
USH00229860	32.90	-90.38	32.60	MS YAZOO CITY 5 NNE
USH00230204	38.18	-94.02	259.70	MO APPLETON CITY
USH00230856	39.34	-91.17	270.40	MO BOWLING GREEN 1 E
USH00231037	39.42	-93.13	201.80	MO BRUNSWICK
USH00231364	36.16	-89.66	82.30	MO CARUTHERSVILLE
USH00231711	38.39	-93.77	234.70	MO CLINTON
USH00231822	40.23	-94.68	337.70	MO CONCEPTION
USH00232289	36.62	-90.81	88.10	MO DONIPHAN
USH00232809	37.79	-90.41	282.90	MO FARMINGTON
USH00234271	38.58	-92.18	204.20	MO JEFFERSON CITY WTP
USH00234705	37.49	-94.26	298.70	MO LAMAR
USH00234825	37.68	-92.69	389.80	MO LEBANON 2W
USH00234850	38.88	-94.33	304.80	MO LEES SUMMIT REED WR
USH00234904	39.18	-93.85	251.50	MO LEXINGTON 3E
USH00235027	37.39	-93.94	326.10	MO LOCKWOOD
USH00235253	37.30	-89.96	118.90	MO MARBLE HILL

USH00235541	39.17	-91.88	244.40	MO MEXICO
USH00235671	39.41	-92.43	262.10	MO MOBERLY
USH00235834	37.15	-92.26	442.00	MO MTN GROVE 2 N
USH00235976	36.86	-94.36	308.20	MO NEOSHO
USH00237263	37.95	-91.77	355.70	MO ROLLA UNI OF MISSOURI
USH00237963	40.24	-93.71	266.70	MO SPICKARD 7 W
USH00238051	39.97	-91.88	210.30	MO STEFFENVILLE
USH00238223	38.96	-93.41	205.70	MO SWEET SPRINGS
USH00238466	38.25	-93.39	192.60	MO TRUMAN DAM & RSVR
USH00238523	40.47	-93.00	323.10	MO UNIONVILLE
USH00238725	38.83	-91.13	252.10	MO WARRENTON 1 N
USH00240199	46.13	-112.95	1609.30	MT ANACONDA
USH00240364	47.49	-112.39	1240.50	MT AUGUSTA
USH00240780	45.83	-109.95	1249.70	MT BIG TIMBER
USH00241044	45.66	-111.04	1497.50	MT BOZEMAN MONTANA ST U
USH00241552	47.21	-111.71	1024.10	MT CASCADE 5 S
USH00241722	48.58	-109.22	737.60	MT CHINOOK
USH00241737	47.82	-112.19	1172.00	MT CHOTEAU
USH00242173	48.60	-112.37	1169.80	MT CUT BANK AP
USH00242409	45.21	-112.64	1593.50	MT DILLON WMCE
USH00242689	45.89	-104.54	1043.90	MT EKALAKA
USH00242793	45.33	-111.71	1509.70	MT ENNIS
USH00243013	46.85	-108.31	954.90	MT FLATWILLOW 4 ENE
USH00243089	48.77	-107.45	792.20	MT FORKS 4 NNE
USH00243110	48.49	-109.79	796.40	MT FT ASSINNIBOINE
USH00243139	48.77	-114.89	914.40	MT FORTINE 1 N
USH00243558	48.21	-106.62	696.50	MT GLASGOW INTL AP
USH00243581	47.10	-104.71	632.80	MT GLENDIVE
USH00243751	47.47	-111.38	1116.80	MT GREAT FALLS AP
USH00243885	46.25	-114.16	1080.50	MT HAMILTON
USH00244038	44.86	-111.33	1977.80	MT HEBGEN DAM
USH00244055	46.60	-111.96	1166.80	MT HELENA AP ASOS
USH00244345	45.92	-108.24	924.80	MT HUNTLEY EXP STN
USH00244364	45.93	-107.13	944.90	MT HYSHAM 25 SSE
USH00244522	47.31	-106.91	798.60	MT JORDAN
USH00244558	48.30	-114.26	901.30	MT KALISPELL GLACIER AP
USH00245015	48.40	-115.53	638.90	MT LIBBY 1 NE RS
USH00245080	45.48	-110.56	1484.40	MT LIVINGSTON 12 S
USH00245338	48.39	-107.72	680.00	MT MALTA 7 E
USH00245572	48.48	-104.45	591.90	MT MEDICINE LAKE 3 SE
USH00245668	46.76	-104.96	757.10	MT MILDRED 5 N
USH00245690	46.42	-105.88	799.80	MT MILES CITY AP
USH00245761	47.05	-109.95	1310.60	MT MOCCASIN EXP STN
USH00246157	45.48	-111.63	1446.30	MT NORRIS MADISON PH
USH00246472	46.31	-113.30	1606.30	MT PHILIPSBURG RS
USH00246601	46.41	-104.51	847.30	MT PLEVNA
USH00246918	45.17	-109.24	1718.20	MT RED LODGE
USH00247286	47.31	-114.09	883.90	MT SAINT IGNATIUS
USH00247318	47.30	-115.09	810.80	MT SAINT REGIS 1 NE
USH00247382	47.45	-104.33	602.00	MT SAVAGE
USH00248501	48.30	-112.25	1161.30	MT VALIER
USH00248569	47.88	-105.36	696.20	MT VIDA 6 NE
USH00248597	45.29	-111.94	1759.60	MT VIRGINIA CITY

USH00248857	44.65	-111.10	2029.70	MT WEST YELLOWSTONE
USH00248930	46.54	-110.90	1536.20	MT WHITE SULPHUR SPRNGS 2
USH00250070	41.68	-98.00	545.60	NE ALBION
USH00250130	42.11	-102.89	1217.40	NE ALLIANCE 1WNW
USH00250375	41.04	-96.37	326.10	NE ASHLAND NO 2
USH00250420	42.51	-99.03	637.00	NE ATKINSON 3SW
USH00250435	40.37	-95.74	283.50	NE AUBURN 5 ESE
USH00250622	40.29	-96.75	395.30	NE BEATRICE 1N
USH00250640	40.13	-99.82	658.40	NE BEAVER CITY
USH00251145	41.66	-103.10	1117.40	NE BRIDGEPORT
USH00251200	41.40	-99.67	762.00	NE BROKEN BOW 2 W
USH00252020	40.61	-96.94	437.40	NE CRETE
USH00252100	40.67	-100.49	829.40	NE CURTIS 3NNE
USH00252205	41.24	-97.13	490.70	NE DAVID CITY
USH00252820	40.07	-97.16	411.50	NE FAIRBURY 5S
USH00252840	40.64	-97.59	499.90	NE FAIRMONT
USH00253035	40.10	-98.96	565.40	NE FRANKLIN
USH00253175	40.53	-97.59	496.80	NE GENEVA
USH00253185	41.45	-97.76	484.60	NE GENOA 2 W
USH00253365	40.94	-100.15	787.90	NE GOTHENBURG
USH00253615	42.68	-103.88	1478.30	NE HARRISON
USH00253630	42.61	-97.26	417.60	NE HARTINGTON
USH00253660	40.64	-98.38	591.30	NE HASTINGS 4N
USH00253715	42.51	-102.69	1159.80	NE HAY SPRINGS 12 S
USH00253735	40.17	-97.59	451.10	NE HEBRON
USH00253910	40.45	-99.38	707.10	NE HOLDREGE
USH00254110	40.52	-101.65	999.70	NE IMPERIAL
USH00254440	41.24	-103.63	1435.00	NE KIMBALL 2NE
USH00254900	41.14	-102.63	1168.00	NE LODGEPOLE
USH00254985	41.28	-98.96	627.30	NE LOUP CITY
USH00255080	41.82	-97.45	481.60	NE MADISON
USH00255310	40.21	-100.62	796.10	NE MC COOK
USH00255470	42.91	-101.70	986.00	NE MERRIMAN
USH00255565	40.51	-98.95	658.40	NE MINDEN
USH00256040	41.49	-98.77	597.40	NE NORTH LOUP
USH00256135	42.06	-97.96	521.20	NE OAKDALE
USH00256570	40.12	-96.15	378.00	NE PAWNEE CITY
USH00256970	42.06	-100.24	819.90	NE PURDUM
USH00257070	40.09	-98.51	524.30	NE RED CLOUD
USH00257515	41.26	-98.46	541.00	NE SAINT PAUL 4N
USH00257715	40.90	-97.09	438.90	NE SEWARD
USH00258133	41.45	-100.59	911.40	NE STAPLETON 5W
USH00258395	40.68	-96.18	335.30	NE SYRACUSE
USH00258465	40.35	-96.19	338.30	NE TECUMSEH 1S
USH00258480	41.78	-96.22	338.30	NE TEKAMAH
USH00258915	42.26	-96.86	423.70	NE WAKEFIELD
USH00259090	40.86	-96.14	335.30	NE WEEPING WATER
USH00259510	40.86	-97.59	490.70	NE YORK
USH00260507	39.49	-117.06	2066.50	NV AUSTIN #2
USH00260691	40.61	-116.89	1373.10	NV BATTLE MOUNTAIN 4SE
USH00261071	35.98	-114.84	762.00	NV BOULDER CITY
USH00262573	40.82	-115.78	1533.10	NV ELKO RGNL AP
USH00262780	39.45	-118.78	1208.50	NV FALLON EXP STN

USH00263245	40.95	-117.49	1339.30	NV GOLCONDA
USH00264698	40.19	-118.47	1211.60	NV LOVELOCK
USH00264950	39.41	-114.77	1911.10	NV MCGILL
USH00265168	38.38	-118.10	1391.70	NV MINA
USH00266779	39.48	-119.77	1344.20	NV RENO AP
USH00267369	35.46	-114.92	1079.00	NV SEARCHLIGHT
USH00268988	41.10	-114.97	1737.40	NV WELLS
USH00269171	40.90	-117.80	1309.40	NV WINNEMUCCA AP
USH00270706	44.30	-71.65	359.70	NH BETHLEHEM 2
USH00272174	43.15	-70.95	24.40	NH DURHAM
USH00272999	45.08	-71.28	506.00	NH FIRST CONNECTICUT LAKE
USH00273850	43.70	-72.28	183.80	NH HANOVER
USH00274399	42.93	-72.32	158.50	NH KEENE
USH00280325	39.37	-74.42	3.00	NJ ATLANTIC CITY
USH00280734	40.82	-75.08	80.20	NJ BELVIDERE BRG
USH00280907	40.90	-74.40	85.30	NJ BOONTON 1 SE
USH00281582	41.03	-74.42	231.60	NJ CHARLOTTEBURG RSVR
USH00283029	40.56	-74.88	79.20	NJ FLEMINGTON 5 NNW
USH00283951	40.26	-74.56	30.50	NJ HIGHTSTOWN 2 W
USH00284229	39.81	-74.78	30.50	NJ INDIAN MILLS 2 W
USH00284987	40.27	-74.00	9.10	NJ LONG BRANCH OAKHURST
USH00285728	39.95	-74.96	13.70	NJ MOORESTOWN
USH00286055	40.47	-74.43	26.20	NJ NEW BRUNSWICK 3 SE
USH00287079	40.60	-74.40	27.40	NJ PLAINFIELD
USH00288816	39.95	-74.21	30.50	NJ TOMS RIVER
USH00290692	36.83	-108.00	1720.30	NM AZTEC RUINS NM
USH00290858	35.52	-104.09	1371.60	NM BELL RANCH
USH00291469	32.34	-104.22	951.00	NM CARLSBAD
USH00291515	33.63	-105.89	1647.40	NM CARRIZOZO 1SW
USH00291664	36.91	-106.57	2392.70	NM CHAMA
USH00291813	36.46	-104.94	1993.40	NM CIMARRON 4 SW
USH00291887	36.44	-103.15	1511.80	NM CLAYTON MUNI ARPK AP
USH00292608	36.93	-107.00	2070.50	NM DULCE
USH00292848	33.14	-107.18	1394.80	NM ELEPHANT BUTTE DAM
USH00293265	32.79	-108.15	1872.10	NM FT BAYARD
USH00293294	34.46	-104.23	1226.80	NM FT SUMNER
USH00293368	32.22	-108.08	1365.20	NM GAGE
USH00294369	35.77	-106.68	1908.70	NM JEMEZ SPRINGS
USH00294426	32.61	-106.74	1300.30	NM JORNADA EXP RANGE
USH00294862	35.56	-105.21	1935.20	NM LAS VEGAS WWTP
USH00295150	34.76	-106.76	1475.20	NM LOS LUNAS 3 SSW
USH00295273	33.82	-108.94	2148.80	NM LUNA RS
USH00295960	32.95	-105.82	2066.50	NM MTN PARK
USH00295965	34.52	-106.26	1987.30	NM MOUNTAINAIR
USH00296435	32.37	-106.09	1274.70	NM OROGRANDE
USH00297323	36.70	-105.40	2644.40	NM RED RIVER
USH00297610	33.30	-104.50	1112.20	NM ROSWELL IND AP
USH00297867	35.10	-103.32	1289.30	NM SAN JON
USH00298107	34.93	-104.68	1405.10	NM SANTA ROSA
USH00298387	34.08	-106.88	1397.50	NM SOCORRO
USH00298501	36.36	-104.58	1794.70	NM SPRINGER
USH00298535	32.28	-106.75	1182.90	NM STATE UNIV
USH00299156	35.20	-103.68	1245.40	NM TUCUMCARI 4 NE

USH00299165	33.07	-106.04	1350.30	NM TULAROSA
USH00300023	42.10	-77.23	304.50	NY ADDISON
USH00300042	42.74	-73.80	83.80	NY ALBANY INTL AP
USH00300085	42.26	-77.78	539.50	NY ALFRED
USH00300093	42.10	-78.75	457.20	NY ALLEGANY SP
USH00300183	42.30	-77.98	440.40	NY ANGELICA
USH00300321	42.93	-76.54	234.70	NY AUBURN
USH00300443	43.03	-78.16	278.30	NY BATAVIA
USH00300687	42.20	-75.98	486.20	NY BINGHAMTON GREATER AP
USH00300889	40.94	-72.30	18.30	NY BRIDGEHAMPTON
USH00300937	43.20	-77.93	163.10	NY BROCKPORT
USH00301012	42.94	-78.73	214.90	NY BUFFALO NIAGARA INTL
USH00301185	44.57	-75.10	136.60	NY CANTON 4 SE
USH00301401	44.87	-73.39	47.90	NY CHAZY
USH00301752	42.71	-74.92	383.10	NY COOPERSTOWN
USH00301799	42.60	-76.18	344.10	NY CORTLAND
USH00301966	44.71	-73.72	408.40	NY DANNEMORA
USH00301974	42.56	-77.71	201.20	NY DANSVILLE
USH00302060	42.06	-75.42	304.80	NY DEPOSIT
USH00302129	41.00	-73.83	61.00	NY DOBBS FERRY ARDSLEY
USH00302610	42.09	-76.83	288.60	NY ELMIRA
USH00303033	42.44	-79.31	231.60	NY FREDONIA
USH00303184	42.87	-77.03	218.80	NY GENEVA RSCH FARM
USH00303259	41.51	-73.93	83.80	NY GLENHAM
USH00303319	43.04	-74.35	246.90	NY GLOVERSVILLE
USH00303773	42.77	-77.60	274.90	NY HEMLOCK
USH00304102	43.75	-74.26	506.00	NY INDIAN LAKE 2SW
USH00304174	42.44	-76.44	292.60	NY ITHACA CORNELL UNIV
USH00304555	44.24	-73.98	591.30	NY LAKE PLACID 2 S
USH00304647	44.75	-74.66	142.00	NY LAWRENCEVILLE 3 SW
USH00304791	43.06	-74.86	274.30	NY LITTLE FALLS CITY RSVR
USH00304796	43.03	-74.86	109.70	NY LITTLE FALLS MILL ST
USH00304844	43.13	-78.68	184.40	NY LOCKPORT 3 S
USH00304912	43.79	-75.48	262.10	NY LOWVILLE
USH00304996	44.84	-74.30	268.20	NY MALONE
USH00305113	42.46	-75.01	373.40	NY MARYLAND 9 SW
USH00305426	41.76	-74.15	379.50	NY MOHONK LAKE
USH00305512	42.84	-75.72	396.20	NY MORRISVILLE 6 SW
USH00305801	40.77	-73.96	39.60	NY NY CITY CNTRL PARK
USH00306085	42.51	-75.51	301.40	NY NORWICH
USH00306164	44.72	-75.44	85.30	NY OGDENSBURG 4 NE
USH00306314	43.46	-76.49	106.70	NY OSWEGO EAST
USH00306774	41.38	-74.68	143.30	NY PORT JERVIS
USH00306820	41.59	-73.91	51.80	NY POUGHKEEPSIE
USH00307167	43.11	-77.67	162.50	NY ROCHESTER INTL AP
USH00307484	43.03	-73.81	94.50	NY SARATOGA SPRINGS 4 SW
USH00307633	40.95	-73.10	12.20	NY SETAUKET STRONG
USH00308248	42.69	-73.83	515.10	NY STILLWATER RSVR
USH00308383	43.10	-76.10	125.00	NY SYRACUSE WSO AP
USH00308600	42.75	-73.68	7.30	NY TROY L&D
USH00308631	44.23	-74.43	512.10	NY TUPPER LAKE SUNMOUNT
USH00308737	43.14	-75.38	216.70	NY UTICA FAA AP
USH00308906	41.55	-74.16	115.80	NY WALDEN 1 ESE

USH00308910	42.74	-78.51	332.20	NY WALES
USH00308944	44.14	-74.90	460.20	NY WANAKENA RNGR SCHOOL
USH00309000	43.97	-75.87	151.50	NY WATERTOWN
USH00309292	41.39	-73.96	97.50	NY WEST POINT
USH00309670	41.26	-73.79	204.20	NY YORKTOWN HEIGHTS 1 W
USH00310090	35.39	-80.19	185.90	NC ALBEMARLE
USH00311458	35.23	-75.62	3.40	NC CAPE HATTERAS AP
USH00311677	35.90	-79.07	152.40	NC CHAPEL HILL 2 W
USH00312635	36.01	-76.55	3.00	NC EDENTON
USH00312719	36.30	-76.20	2.40	NC ELIZABETH CITY
USH00313017	35.05	-78.85	29.30	NC FAYETTEVILLE PWC
USH00313510	35.34	-77.96	33.20	NC GOLDSBORO 4 SE
USH00313969	36.34	-78.41	146.30	NC HENDERSON 2 NNW
USH00313976	35.32	-82.44	658.40	NC HENDERSONVILLE 1 NE
USH00314055	35.05	-83.18	1170.40	NC HIGHLANDS
USH00314684	35.19	-77.54	7.30	NC KINSTON 7 SE
USH00314938	35.91	-81.53	365.80	NC LENOIR
USH00315123	36.10	-78.30	79.20	NC LOUISBURG
USH00315177	34.62	-79.02	34.10	NC LUMBERTON
USH00315340	35.66	-82.02	446.80	NC MARION 2 NW
USH00315356	35.80	-82.66	609.60	NC MARSHALL
USH00315771	34.97	-80.52	167.60	NC MONROE 2 SE
USH00315830	34.73	-76.73	3.00	NC MOREHEAD CITY 2 WNW
USH00315838	35.73	-81.67	353.60	NC MORGANTON
USH00315890	36.49	-80.65	317.30	NC MT AIRY 2 W
USH00317202	36.38	-79.69	271.30	NC REIDSVILLE 2 NW
USH00317615	35.68	-80.48	213.40	NC SALISBURY
USH00317994	35.51	-78.34	45.70	NC SMITHFIELD
USH00318113	33.99	-78.00	6.10	NC SOUTHPORT 5 N
USH00318292	35.81	-80.88	289.60	NC STATESVILLE 2 NNE
USH00318500	35.88	-77.53	10.70	NC TARBORO 1 S
USH00318694	36.39	-81.30	876.30	NC TRANSOU
USH00319147	35.48	-82.96	810.20	NC WAYNESVILLE 1 E
USH00319476	35.69	-77.94	33.50	NC WILSON 3 SW
USH00320941	48.82	-100.44	496.20	ND BOTTINEAU
USH00321408	46.87	-97.23	285.00	ND CASSELTON AGRONOMY FM
USH00321871	48.90	-103.29	595.00	ND CROSBY
USH00322188	46.89	-102.81	749.80	ND DICKINSON EXP STN
USH00322365	47.34	-102.58	671.80	ND DUNN CENTER 1E
USH00323207	46.05	-100.66	510.50	ND FT YATES 4 SW
USH00323287	46.15	-98.40	437.40	ND FULLERTON 1 ESE
USH00323594	48.41	-97.42	252.10	ND GRAFTON
USH00323621	47.92	-97.09	253.00	ND GRAND FORKS UNIV NWS
USH00324178	45.99	-102.64	816.90	ND HETTINGER
USH00324203	47.43	-97.06	277.40	ND HILLSBORO 3 N
USH00324418	46.88	-98.68	447.10	ND JAMESTOWN STATE HOSP
USH00324958	48.76	-98.34	492.30	ND LANGDON EXP FARM
USH00325220	46.45	-97.68	336.50	ND LISBON
USH00325479	46.81	-100.90	533.40	ND MANDAN EXP STN
USH00326015	46.67	-100.22	548.60	ND MOFFIT 3 SE
USH00326155	46.37	-102.31	772.70	ND MOTT
USH00326255	46.50	-99.76	603.50	ND NAPOLEON
USH00326315	46.54	-102.86	804.40	ND NEW ENGLAND

USH00326947	48.97	-97.24	240.80	ND PEMBINA
USH00327530	46.88	-102.31	752.90	ND RICHARDTON ABBEY
USH00328792	48.37	-100.39	451.10	ND TOWNER 2 NE
USH00329100	46.32	-96.61	291.40	ND WAHPETON 3 N
USH00329445	48.60	-100.29	449.00	ND WILLOW CITY
USH00331072	40.81	-82.96	291.10	OH BUCYRUS
USH00331152	40.26	-80.99	384.00	OH CADIZ
USH00331541	41.05	-81.93	359.70	OH CHIPPEWA LAKE
USH00331592	39.61	-82.95	205.10	OH CIRCLEVILLE
USH00331890	40.24	-81.87	231.60	OH COSHOCTON WPC PLT
USH00332098	41.27	-84.38	213.40	OH DEFIANCE
USH00332119	40.31	-83.07	280.40	OH DELAWARE
USH00332791	41.04	-83.66	234.10	OH FINDLAY WPC
USH00333375	40.10	-84.65	312.10	OH GREENVILLE WTP
USH00333758	39.20	-83.61	335.30	OH HILLSBORO
USH00333780	41.30	-81.15	374.90	OH HIRAM
USH00334189	40.64	-83.60	303.30	OH KENTON
USH00335041	39.65	-81.85	231.60	OH MC CONNELLSVILLE LK 7
USH00335297	40.55	-81.91	249.60	OH MILLERSBURG
USH00335315	40.76	-80.85	356.60	OH MILLPORT 4 NE
USH00336118	41.26	-82.61	204.20	OH NORWALK WWTP
USH00336196	41.26	-82.21	248.70	OH OBERLIN
USH00336600	39.83	-81.91	310.90	OH PHILO 3 SW
USH00336781	38.75	-82.88	164.60	OH PORTSMOUTH-SCIOTOVILLE
USH00338313	41.11	-83.16	225.60	OH TIFFIN
USH00338534	40.83	-83.28	260.30	OH UPPER SANDUSKY
USH00338552	40.10	-83.78	304.80	OH URBANA WWTP
USH00338769	41.20	-80.81	274.30	OH WARREN 3 S
USH00338822	41.51	-84.14	228.60	OH WAUSEON WTP
USH00338830	39.11	-82.97	170.70	OH WAVERLY
USH00339312	40.78	-81.91	310.90	OH WOOSTER EXP STN
USH00340017	34.78	-96.68	309.40	OK ADA
USH00340179	34.59	-99.33	420.60	OK ALTUS IRIG RSCH STN
USH00340256	34.22	-95.61	143.30	OK ANTLERS
USH00340292	34.17	-97.12	268.20	OK ARDMORE
USH00340548	36.76	-96.02	217.90	OK BARTLESVILLE MUNI AP
USH00340593	36.81	-100.53	751.30	OK BEAVER
USH00340908	36.72	-102.48	1259.70	OK BOISE CITY 2 E
USH00341243	36.80	-99.64	588.30	OK BUFFALO 2 SSW
USH00341504	35.17	-98.57	451.40	OK CARNEGIE 5 NE
USH00341724	36.77	-98.35	359.70	OK CHEROKEE
USH00341828	36.32	-95.58	179.20	OK CLAREMORE 2 ENE
USH00342678	34.00	-96.36	182.90	OK DURANT
USH00342912	36.41	-97.87	379.50	OK ENID
USH00342944	35.21	-99.86	627.90	OK ERICK
USH00343497	35.62	-98.32	487.70	OK GEARY
USH00343628	36.59	-101.61	1008.90	OK GOODWELL RSCH STN
USH00343821	35.81	-97.39	338.30	OK GUTHRIE 5S
USH00343871	35.58	-99.39	554.70	OK HAMMON 3 SSW
USH00344055	36.09	-97.83	357.80	OK HENNESSEY 4 ESE
USH00344204	34.98	-99.05	474.30	OK HOBART MUNI AP
USH00344235	35.05	-96.38	260.60	OK HOLDENVILLE 2SSE
USH00344298	36.85	-101.21	912.90	OK HOOKER

USH00344573	36.72	-97.79	318.50	OK JEFFERSON
USH00344766	36.90	-102.96	1325.90	OK KENTON
USH00344861	35.85	-97.92	320.00	OK KINGFISHER
USH00345063	34.60	-98.45	350.50	OK LAWTON
USH00345509	34.89	-99.50	486.20	OK MANGUM
USH00345779	35.50	-96.97	281.90	OK MEEKER 5 W
USH00345855	36.88	-94.88	245.40	OK MIAMI
USH00346130	35.77	-95.33	157.90	OK MUSKOGEE
USH00346139	36.22	-99.17	576.10	OK MUTUAL
USH00346278	36.89	-97.05	347.50	OK NEWKIRK 1NW
USH00346629	36.12	-98.31	370.30	OK OKEENE
USH00346638	35.42	-96.30	285.00	OK OKEMAH
USH00346670	35.62	-96.02	197.20	OK OKMULGEE WTR WKS
USH00346926	34.72	-97.28	286.50	OK PAULS VALLEY 4 WSW
USH00346935	36.66	-96.34	254.50	OK PAWHUSKA
USH00347012	36.28	-97.28	312.40	OK PERRY
USH00347254	35.05	-94.62	134.10	OK POTEAU WTR WKS
USH00348501	36.11	-97.09	272.80	OK STILLWATER 2 W
USH00348677	35.93	-94.96	259.10	OK TAHLEQUAH
USH00349395	34.17	-97.99	278.00	OK WAURIKA
USH00349422	35.52	-98.69	493.20	OK WEATHERFORD
USH00349445	35.48	-95.20	167.60	OK WEBBERS FALLS 5 WSW
USH00350304	42.21	-122.71	532.20	OR ASHLAND
USH00350328	46.15	-123.88	2.70	OR ASTORIA AP PORT OF
USH00350412	44.84	-117.80	1024.40	OR BAKER CITY AP
USH00350694	44.05	-121.28	1115.60	OR BEND
USH00351055	42.03	-124.24	15.20	OR BROOKINGS 2 SE
USH00351433	44.39	-122.48	292.60	OR CASCADIA
USH00351765	45.23	-120.18	865.60	OR CONDON
USH00351862	44.63	-123.19	68.60	OR CORVALLIS STATE UNIV
USH00351897	43.79	-123.02	181.40	OR COTTAGE GROVE 1 NNE
USH00351946	42.89	-122.13	1973.60	OR CRATER LAKE NPS HQ
USH00352135	42.94	-117.33	1287.80	OR DANNER
USH00352406	43.66	-123.32	89.00	OR DRAIN
USH00352440	45.45	-121.13	405.40	OR DUFUR
USH00352997	45.52	-123.10	54.90	OR FOREST GROVE
USH00353095	43.39	-121.21	1404.80	OR FREMONT 5 NW
USH00353445	42.42	-123.32	283.50	OR GRANTS PASS
USH00353770	45.44	-122.15	228.00	OR HEADWORKS PORTLAND WTR
USH00353827	45.36	-119.56	574.50	OR HEPPNER
USH00353847	45.82	-119.26	195.10	OR HERMISTON 1 SE
USH00354003	45.68	-121.51	152.40	OR HOOD RIVER EXP STN
USH00354506	42.20	-121.78	1249.10	OR KLAMATH FALLS 2 SSW
USH00354670	42.21	-120.36	1456.30	OR LAKEVIEW 2 NNW
USH00355162	43.26	-118.84	1255.20	OR MALHEUR REFUGE HQ
USH00355362	44.17	-122.11	450.50	OR MCKENZIE BRG RS
USH00355384	45.22	-123.16	47.20	OR MC MINNVILLE
USH00355593	45.94	-118.40	295.70	OR MILTON FREEWATER
USH00355734	45.48	-120.72	570.00	OR MORO
USH00356032	44.64	-124.05	37.20	OR NEWPORT
USH00356073	43.41	-124.24	1.80	OR NORTH BEND FCWOS
USH00356426	42.69	-120.54	1328.90	OR PAISLEY
USH00356634	45.47	-118.82	524.30	OR PILOT ROCK 1 SE

USH00356883	44.30	-120.80	888.50	OR PRINEVILLE
USH00356907	42.73	-122.51	756.50	OR PROSPECT 2 SW
USH00357169	42.95	-123.35	207.30	OR RIDDLE
USH00357331	43.21	-123.36	129.50	OR ROSEBURG KQEN
USH00358466	45.12	-122.07	341.40	OR THREE LYNX
USH00358494	45.45	-123.87	3.00	OR TILLAMOOK 1 W
USH00358746	45.20	-117.87	842.80	OR UNION EXP STN
USH00358797	43.98	-117.24	682.80	OR VALE
USH00358997	45.57	-117.53	890.90	OR WALLOWA
USH00360106	40.65	-75.44	118.90	PA ALLENTOWN AP
USH00361354	39.93	-77.63	195.10	PA CHAMBERSBURG 1 ESE
USH00362537	39.80	-77.22	164.60	PA EISENHOWER NHS
USH00362682	42.08	-80.18	222.50	PA ERIE WSO AP
USH00363028	41.40	-79.83	309.40	PA FRANKLIN
USH00363526	41.41	-80.36	344.40	PA GREENVILLE 2 NE
USH00364385	40.33	-78.91	370.00	PA JOHNSTOWN
USH00364896	40.33	-76.46	137.20	PA LEBANON 2 W
USH00365915	41.85	-75.85	432.80	PA MONTROSE
USH00366233	41.01	-80.36	251.50	PA NEW CASTLE 1 N
USH00366689	40.80	-75.61	125.00	PA PALMERTON
USH00367029	41.73	-75.44	548.60	PA PLEASANT MT 1 W
USH00367322	40.42	-75.93	109.70	PA READING 4 NNW
USH00367477	41.42	-78.74	414.50	PA RIDGWAY
USH00367931	40.78	-76.86	128.00	PA SELINGSGROVE 2 S
USH00368449	40.79	-77.86	356.60	PA STATE COLLEGE
USH00368596	41.01	-75.19	140.20	PA STROUDSBURG
USH00368905	41.75	-76.44	231.60	PA TOWANDA 1 S
USH00369050	39.91	-79.71	291.40	PA UNIONTOWN 1 NE
USH00369298	41.85	-79.15	368.80	PA WARREN
USH00369408	41.70	-77.38	554.10	PA WELLSBORO 4 SW
USH00369464	39.97	-75.63	114.30	PA WEST CHESTER 2 NW
USH00369728	41.24	-76.92	158.50	PA WILLIAMSPORT RGNL AP
USH00369933	39.91	-76.75	118.90	PA YORK 3 SSW PUMP
USH00370896	41.16	-71.58	33.50	RI BLOCK ISLAND STATE AP
USH00374266	41.49	-71.54	34.70	RI KINGSTON
USH00376698	41.72	-71.43	15.50	RI PROVIDENCE WSO AP
USH00380074	33.49	-81.69	150.00	SC AIKEN 5SE
USH00380165	34.52	-82.66	243.80	SC ANDERSON
USH00380559	32.39	-80.69	7.60	SC BEAUFORT WWTP
USH00380764	33.36	-81.32	98.80	SC BLACKVILLE 3 W
USH00381277	34.09	-82.58	161.50	SC CALHOUN FALLS
USH00381310	34.24	-80.65	42.70	SC CAMDEN 3 W
USH00381549	32.78	-79.93	3.00	SC CHARLESTON CITY
USH00381588	34.73	-79.88	42.70	SC CHERAW
USH00381770	34.66	-82.82	251.20	SC CLEMSON UNIV
USH00381944	33.98	-81.01	73.80	SC COLUMBIA UNIV OF SC
USH00381997	33.83	-79.05	6.10	SC CONWAY
USH00382260	34.30	-79.87	45.70	SC DARLINGTON
USH00383468	33.36	-79.22	3.00	SC GEORGETOWN 2 E
USH00383747	34.88	-82.22	287.40	SC GRNVL SPART INTL AP
USH00383754	34.19	-82.17	187.50	SC GREENWOOD
USH00384690	34.53	-80.59	138.10	SC KERSHAW 1SW
USH00384753	33.67	-79.82	22.90	SC KINGSTREE

USH00385017	34.49	-82.02	179.50	SC LAURENS
USH00385200	34.19	-81.41	216.70	SC LITTLE MTN
USH00386209	34.29	-81.62	145.10	SC NEWBERRY
USH00386527	33.48	-80.87	54.90	SC ORANGEBURG 2
USH00387631	33.99	-81.77	146.30	SC SALUDA
USH00387722	34.63	-81.52	158.50	SC SANTUCK
USH00388426	33.03	-80.23	19.80	SC SUMMERVILLE 4W
USH00388440	33.93	-80.35	53.90	SC SUMTER
USH00388887	34.74	-83.08	298.70	SC WALHALLA
USH00389327	34.37	-81.09	170.70	SC WINNSBORO
USH00389350	34.93	-81.03	210.30	SC WINTHROP UNIV
USH00389469	32.68	-80.84	7.60	SC YEMASSEE
USH00390020	45.44	-98.41	395.30	SD ABERDEEN RGNL AP
USH00390043	43.48	-99.06	512.10	SD ACADEMY 2NE
USH00390128	43.65	-97.78	412.40	SD ALEXANDRIA
USH00391392	43.30	-96.59	410.00	SD CANTON
USH00391739	44.88	-97.73	549.90	SD CLARK
USH00391972	43.96	-101.86	735.80	SD COTTONWOOD 2 E
USH00392429	45.04	-101.59	723.90	SD DUPREE
USH00392797	45.76	-99.63	566.90	SD EUREKA
USH00392927	45.03	-99.13	478.50	SD FAULKTON 1 NW
USH00393029	44.04	-98.07	374.90	SD FORESTBURG 3 NE
USH00393217	44.05	-99.07	524.30	SD GANN VALLEY 4NW
USH00393832	44.52	-99.45	576.10	SD HIGHMORE 1 W
USH00394007	43.43	-103.47	1085.10	SD HOT SPRINGS
USH00394037	44.01	-97.52	474.90	SD HOWARD
USH00394516	43.90	-99.86	518.20	SD KENNEBEC
USH00395456	45.15	-98.58	396.80	SD MELLETTE 4 W
USH00395481	43.23	-97.57	403.60	SD MENNO
USH00395536	45.28	-96.66	349.00	SD MILBANK 4 NW
USH00395891	43.88	-100.70	707.10	SD MURDO
USH00396170	44.44	-100.41	506.00	SD OAHE DAM
USH00396597	44.38	-100.28	531.00	SD PIERRE RGNL AP
USH00396947	44.11	-103.28	1051.60	SD RAPID CITY 4NW
USH00398622	42.76	-96.91	362.70	SD VERMILLION 2 SE
USH00398932	44.90	-97.14	532.80	SD WATERTOWN RGNL AP
USH00399442	43.49	-100.47	664.50	SD WOOD
USH00401790	36.54	-87.35	116.40	TN CLARKSVILLE WWTP
USH00402024	34.99	-84.37	442.00	TN COPPERHILL
USH00402108	35.54	-89.70	117.30	TN COVINGTON 3 SW
USH00402202	36.01	-85.13	551.70	TN CROSSVILLE ED & RESEARCH
USH00402489	36.07	-87.39	237.70	TN DICKSON
USH00402589	36.48	-87.86	144.80	TN DOVER 1 W
USH00404561	35.62	-88.84	121.90	TN JACKSON EXP STN
USH00405187	35.41	-86.80	239.90	TN LEWISBURG EXP STN
USH00405882	35.67	-85.78	286.50	TN MC MINNVILLE
USH00406371	35.92	-86.37	163.10	TN MURFREESBORO 5 N
USH00406534	35.98	-83.20	315.80	TN NEWPORT 1 NW
USH00407884	36.41	-82.98	413.00	TN ROGERSVILLE 1 NE
USH00409155	35.34	-86.20	311.50	TN TULLAHOMA
USH00409219	36.39	-89.03	106.70	TN UNION CITY
USH00409502	35.30	-87.75	228.60	TN WAYNESBORO
USH00410120	32.72	-99.30	426.70	TX ALBANY

USH00410144	27.72	-98.06	61.30	TX ALICE
USH00410174	30.37	-103.66	1356.40	TX ALPINE
USH00410493	31.74	-99.97	534.90	TX BALLINGER 2 NW
USH00410498	30.98	-103.74	981.50	TX BALMORHEA
USH00410639	28.45	-97.70	77.70	TX BEEVILLE 5 NE
USH00410832	30.10	-98.42	419.10	TX BLANCO
USH00410902	29.79	-98.73	440.10	TX BOERNE
USH00411000	35.53	-102.25	972.60	TX BOYS RANCH
USH00411048	30.15	-96.39	95.40	TX BRENHAM
USH00411138	31.73	-98.94	426.70	TX BROWNWOOD 2ENE
USH00411528	28.33	-99.63	170.70	TX CATARINA
USH00411772	33.61	-95.07	132.60	TX CLARKSVILLE 2NE
USH00412015	27.77	-97.51	13.40	TX CORPUS CHRISTI AP
USH00412019	32.10	-96.47	125.90	TX CORSICANA
USH00412121	33.65	-101.24	917.40	TX CROSBYTON
USH00412266	29.05	-96.23	21.30	TX DANEVANG 1 W
USH00412598	32.06	-98.30	447.40	TX DUBLIN 2SE
USH00412679	28.75	-100.47	247.50	TX EAGLE PASS 3N
USH00412797	31.81	-106.37	1194.20	TX EL PASO AP
USH00412906	28.02	-99.35	176.80	TX ENCINAL
USH00413063	27.13	-98.12	42.40	TX FALFURRIAS
USH00413183	29.67	-97.11	158.50	TX FLATONIA
USH00413280	30.90	-102.91	926.00	TX FT STOCKTON
USH00413420	33.64	-97.05	265.20	TX GAINESVILLE 5 ENE
USH00413734	33.16	-96.09	166.10	TX GREENVILLE KGV L RADIO
USH00413873	29.47	-96.93	83.80	TX HALLETTSVILLE 2 N
USH00413992	33.15	-99.74	487.70	TX HASKELL
USH00415018	31.07	-98.18	314.60	TX LAMPASAS
USH00415196	30.05	-94.79	10.70	TX LIBERTY
USH00415272	30.74	-98.65	310.90	TX LLANO
USH00415429	29.67	-97.65	121.90	TX LULING
USH00415618	32.54	-94.35	107.30	TX MARSHALL
USH00415707	31.13	-102.22	757.70	TX MCCAMEY
USH00415869	31.70	-96.51	161.50	TX MEXIA
USH00415875	35.70	-100.64	839.70	TX MIAMI
USH00416135	34.21	-102.73	1167.40	TX MULESHOE #1
USH00416276	29.71	-98.11	208.80	TX NEW BRAUNFELS
USH00416794	33.67	-95.55	165.20	TX PARIS
USH00416892	31.41	-103.50	795.50	TX PECOS
USH00417079	34.18	-101.70	1027.20	TX PLAINVIEW
USH00417336	34.27	-99.75	488.30	TX QUANAH 2 SW
USH00417622	26.37	-98.81	52.40	TX RIO GRANDE CITY
USH00417945	29.53	-98.47	246.60	TX SAN ANTONIO INTL AP
USH00418201	32.71	-102.65	1016.80	TX SEMINOLE
USH00418433	32.71	-100.91	706.80	TX SNYDER
USH00418692	36.33	-102.07	1125.60	TX STRATFORD
USH00418910	31.07	-97.31	193.50	TX TEMPLE
USH00419532	32.74	-97.77	291.10	TX WEATHERFORD
USH00420086	37.44	-112.48	2145.80	UT ALTON
USH00420738	37.61	-109.48	1854.70	UT BLANDING
USH00420788	37.28	-109.55	1318.00	UT BLUFF
USH00421731	41.54	-112.11	1289.30	UT CORINNE
USH00422101	39.28	-112.65	1399.00	UT DESERET

USH00422253	40.16	-110.39	1682.50	UT DUCHESNE
USH00422592	37.76	-111.59	1770.90	UT ESCALANTE
USH00422726	41.02	-111.93	1335.00	UT FARMINGTON 3 NW
USH00422828	38.96	-112.32	1560.60	UT FILLMORE
USH00422996	40.28	-109.86	1539.20	UT FT DUCHESNE
USH00423418	38.99	-110.15	1240.50	UT GREEN RIVER AVIATION
USH00423611	38.37	-110.71	1313.10	UT HANKSVILLE
USH00423809	40.49	-111.42	1703.80	UT HEBER
USH00424508	37.02	-112.53	1493.50	UT KANAB
USH00424856	41.82	-111.32	1822.70	UT LAKETOWN
USH00425065	39.56	-111.86	1614.80	UT LEVAN
USH00425186	41.74	-111.80	1460.00	UT LOGAN UTAH ST UNIV
USH00425402	39.25	-111.63	1749.60	UT MANTI
USH00425477	38.45	-112.22	1801.40	UT MARYSVALE
USH00425733	38.57	-109.54	1242.70	UT MOAB
USH00425752	37.79	-113.92	1664.20	UT MODENA
USH00425826	41.04	-111.67	1551.40	UT MORGAN POWER & LIGHT
USH00426135	39.71	-111.83	1563.00	UT NEPHI
USH00426404	41.24	-111.94	1325.90	UT OGDEN PIONEER P H
USH00426601	37.82	-112.44	2020.80	UT PANGUITCH
USH00426686	37.84	-112.82	1828.80	UT PAROWAN PWR
USH00427260	38.76	-112.07	1615.40	UT RICHFIELD RADIO KSVC
USH00427516	37.10	-113.56	844.30	UT ST GEORGE
USH00427559	38.91	-111.41	2304.30	UT SALINA 24 E
USH00427714	39.24	-112.10	1619.70	UT SCIPPIO
USH00427729	39.68	-111.20	2655.40	UT SCOFIELD-SKYLINE MINE
USH00427909	40.54	-111.50	1831.80	UT SNAKE CREEK POWERHOUSE
USH00428119	40.07	-111.60	1438.70	UT SPANISH FORK PWR HOUSE
USH00428705	38.96	-109.71	1554.20	UT THOMPSON
USH00428771	40.52	-112.29	1546.60	UT TOOELE
USH00428973	40.35	-111.89	1370.70	UT UTAH LAKE LEHI
USH00429111	40.42	-109.55	1668.50	UT VERNAL 2SW
USH00429382	40.72	-114.03	1291.40	UT WENDOVER AP AWOS
USH00429595	41.52	-111.14	1924.80	UT WOODRUFF
USH00429717	37.20	-112.98	1234.40	UT ZION NP
USH00431081	44.46	-73.15	100.60	VT BURLINGTON WSO AP
USH00431243	43.38	-72.59	256.60	VT CAVENDISH
USH00431360	43.98	-72.45	243.80	VT CHELSEA
USH00431580	43.95	-73.21	105.20	VT CORNWALL
USH00432769	44.90	-72.80	128.00	VT ENOSBURG FALLS
USH00437054	44.42	-72.01	213.40	VT SAINT JOHNSBURY
USH00437607	44.62	-73.30	33.50	VT SOUTH HERO
USH00437612	44.07	-72.97	408.70	VT SOUTH LINCOLN
USH00440766	37.20	-80.41	640.10	VA BLACKSBURG NWSO
USH00440993	37.70	-78.28	68.60	VA BREMO BLUFF
USH00441209	37.09	-81.33	935.10	VA BURKES GARDEN
USH00441593	38.03	-78.52	265.20	VA CHARLOTTESVILLE 2W
USH00442208	38.45	-78.93	426.70	VA DALE ENTERPRISE
USH00442245	36.58	-79.38	125.00	VA DANVILLE
USH00442941	37.32	-78.38	137.20	VA FARMVILLE 2 N
USH00443192	38.31	-77.45	27.40	VA FREDERICKSBURG NP
USH00444101	37.29	-77.27	12.20	VA HOPEWELL
USH00444128	37.99	-79.83	681.50	VA HOT SPRINGS

USH00444876	37.79	-79.41	342.90	VA LEXINGTON
USH00444909	39.08	-77.69	152.40	VA LINCOLN
USH00446139	36.90	-76.19	9.10	VA NORFOLK INTL AP
USH00446626	36.73	-82.99	448.10	VA PENNINGTON GAP
USH00446712	38.23	-78.12	158.50	VA PIEDMONT RSCH STN
USH00447338	36.97	-79.89	400.80	VA ROCKY MT
USH00448062	38.18	-79.09	499.90	VA STAUNTON WATER TRMTMT PLT
USH00449151	37.30	-76.70	21.30	VA WILLIAMSBURG 2 N
USH00449263	38.90	-78.48	205.70	VA WOODSTOCK 2 NE
USH00450008	46.96	-123.82	3.00	WA ABERDEEN
USH00450587	48.71	-122.51	4.60	WA BELLINGHAM 3 SSW
USH00450729	48.97	-122.79	18.30	WA BLAINE
USH00450945	47.16	-122.00	208.80	WA BUCKLEY 1 NE
USH00451233	47.41	-121.75	475.50	WA CEDAR LAKE
USH00451276	46.72	-122.95	56.40	WA CENTRALIA
USH00451484	48.96	-122.32	19.50	WA CLEARBROOK
USH00451504	47.18	-120.94	585.20	WA CLE ELUM
USH00451630	48.54	-117.90	474.60	WA COLVILLE
USH00451666	48.54	-119.74	707.10	WA CONCONULLY
USH00451939	47.37	-123.16	6.40	WA CUSHMAN POWERHOUSE 2
USH00452007	47.65	-118.14	743.70	WA DAVENPORT
USH00452030	46.31	-118.00	474.60	WA DAYTON 1 WSW
USH00452505	46.96	-120.54	451.10	WA ELLENSBURG
USH00452675	47.97	-122.19	18.30	WA EVERETT
USH00452914	47.95	-124.35	106.70	WA FORKS 1 E
USH00453222	45.80	-120.84	499.90	WA GOLDENDALE
USH00454154	46.21	-119.10	118.90	WA KENNEWICK
USH00454748	46.36	-124.03	7.60	WA LONG BEACH EXP STN
USH00454764	46.74	-121.81	841.90	WA LONGMIRE RAINIER NPS
USH00454769	46.15	-122.91	3.70	WA LONGVIEW
USH00455224	47.13	-122.25	176.50	WA MC MILLIN RSVR
USH00455946	48.91	-117.80	423.70	WA NORTHPORT
USH00456039	47.32	-118.69	466.30	WA ODESSA
USH00456096	48.61	-122.80	24.40	WA OLGA 2 SE
USH00456610	46.46	-117.58	579.10	WA POMEROY
USH00456624	48.11	-123.43	27.40	WA PORT ANGELES
USH00456678	48.11	-122.75	30.50	WA PORT TOWNSEND
USH00456789	46.75	-117.19	775.70	WA PULLMAN 2 NW
USH00456914	46.65	-123.73	9.10	WA RAYMOND 2 S
USH00457059	47.11	-118.37	557.80	WA RITZVILLE 1 SSE
USH00457267	47.08	-117.59	592.80	WA SAINT JOHN
USH00457458	47.65	-122.30	5.80	WA SEATTLE URBAN SITE
USH00457507	48.49	-122.23	18.30	WA SEDRO WOOLLEY
USH00457773	47.54	-121.83	134.10	WA SNOQUALMIE FALLS
USH00457938	47.62	-117.52	717.20	WA SPOKANE INTL AP
USH00458059	48.35	-120.72	387.10	WA STEHEKIN 4 NW
USH00458207	46.32	-120.01	227.70	WA SUNNYSIDE
USH00458773	45.67	-122.65	64.00	WA VANCOUVER 4 NNE
USH00458928	46.10	-118.28	355.40	WA WALLA WALLA FAA AP
USH00459012	47.64	-120.06	798.60	WA WATERVILLE
USH00459074	47.42	-120.31	195.10	WA WENATCHEE
USH00459238	47.75	-118.67	679.70	WA WILBUR
USH00459376	48.45	-120.19	534.90	WA WINTHROP 1 WSW

USH00461220	38.98	-80.22	443.50	WV BUCKHANNON
USH00461330	39.20	-81.15	231.60	WV CAIRO
USH00463544	38.93	-80.83	216.40	WV GLENVILLE
USH00465224	37.85	-80.40	701.00	WV LEWISBURG 3 N
USH00465626	39.54	-80.46	335.30	WV MANNINGTON 8 WNW
USH00465707	39.40	-77.98	162.80	WV MARTINSBURG E WV RGNL
USH00466867	39.10	-79.66	556.60	WV PARSONS 1 NE
USH00466989	38.66	-80.20	877.80	WV PICKENS 2 N
USH00467029	37.57	-81.53	390.10	WV PINEVILLE
USH00468384	38.80	-81.36	287.40	WV SPENCER
USH00469368	40.27	-80.61	201.20	WV WELLSBURG WTR TRMT PL
USH00469610	37.67	-82.27	231.60	WV WILLIAMSON
USH00469683	38.52	-81.91	186.20	WV WINFIELD LOCKS
USH00470349	46.58	-90.96	198.10	WI ASHLAND EXP FARM
USH00470991	44.85	-88.98	329.20	WI BOWLER
USH00471078	42.61	-89.38	240.80	WI BRODHEAD
USH00472001	42.67	-90.11	292.60	WI DARLINGTON
USH00472839	43.79	-88.45	231.60	WI FOND DU LAC
USH00473405	44.11	-89.53	331.90	WI HANCOCK EXP FARM
USH00474546	42.82	-90.78	317.00	WI LANCASTER 4 WSW
USH00475017	44.08	-87.65	178.00	WI MANITOWOC
USH00475120	44.63	-90.13	377.00	WI MARSHFIELD EXP FARM
USH00475255	45.13	-90.34	448.10	WI MEDFORD
USH00475474	43.07	-88.02	221.30	WI MILWAUKEE MT MARY COL
USH00475516	45.88	-89.73	488.00	WI MINOCQUA
USH00475808	44.52	-90.63	310.90	WI NEILLSVILLE 3 SW
USH00475932	44.35	-88.71	243.80	WI NEW LONDON
USH00476208	44.88	-87.95	201.20	WI OCONTO 4 W
USH00476330	44.02	-88.55	228.60	WI OSHKOSH
USH00476718	43.52	-89.43	236.20	WI PORTAGE
USH00476827	43.05	-91.13	200.60	WI PRAIRIE DU CHIEN
USH00476922	42.70	-87.78	181.40	WI RACINE
USH00478027	45.82	-91.87	335.30	WI SPOONER AG RES STN
USH00478110	44.96	-90.93	332.20	WI STANLEY
USH00478827	43.55	-90.87	382.50	WI VIROQUA
USH00478919	43.17	-88.73	251.50	WI WATERTOWN
USH00480140	43.77	-111.03	1962.00	WY ALTA 1 NNW
USH00480540	44.37	-108.03	1169.50	WY BASIN
USH00480552	42.63	-106.37	1831.80	WY BATES CREEK #2
USH00481675	41.15	-104.81	1868.40	WY CHEYENNE WSFO AP
USH00481730	41.75	-104.82	1616.70	WY CHUGWATER
USH00481840	44.52	-109.06	1549.00	WY CODY
USH00481905	44.87	-104.15	1060.70	WY COLONY
USH00482595	43.22	-108.94	1699.30	WY DIVERSION DAM
USH00482715	43.53	-109.65	2119.90	WY DUBOIS
USH00483100	41.26	-110.95	2080.30	WY EVANSTON 1 E
USH00484065	41.53	-109.47	1852.30	WY GREEN RIVER
USH00485345	44.56	-110.39	2398.80	WY LAKE YELLOWSTONE
USH00485415	41.31	-105.67	2214.70	WY LARAMIE RGNL AP
USH00485830	42.75	-104.48	1551.40	WY LUSK 2 SW
USH00486195	43.41	-106.27	1481.30	WY MIDWEST
USH00486440	43.85	-110.58	2072.00	WY MORAN 5 WNW
USH00486660	43.85	-104.21	1315.20	WY NEWCASTLE

USH00487115	43.24	-108.69	1658.10	WY PAVILLION
USH00487240	41.17	-104.15	1578.90	WY PINE BLUFFS 5W
USH00487260	42.87	-109.86	2193.00	WY PINEDALE
USH00487388	44.77	-108.75	1332.00	WY POWELL FLD STN
USH00487760	43.03	-108.37	1510.30	WY RIVERTON
USH00487845	41.59	-109.06	2055.00	WY ROCK SPRINGS AP
USH00487990	41.45	-106.80	2069.60	WY SARATOGA
USH00488160	44.84	-106.83	1143.00	WY SHERIDAN FLD STN
USH00488995	42.08	-104.22	1249.10	WY TORRINGTON EXP FARM
USH00489615	42.11	-104.94	1413.70	WY WHEATLAND 4 N
USH00489770	44.01	-107.96	1237.50	WY WORLAND
USH00489905	44.97	-110.69	1898.90	WY YELLOWSTONE PK MAMMOTH

My closest station is the UT Utah Lake Lindon station.

The US Temperature Record 4: Data Flags

/ SEP 22, 2021

The data provided has flags you should understand. Definitions below are from the USHCN Status file.

Data Measurement Flag

```
blank = no measurement information applicable
a-i = number of days missing in calculation of monthly mean
      temperature
[] E = The value is estimated using values from surrounding
[]   stations because a monthly value could not be computed
[]   from daily data; or,
[]       the pairwise homogenization algorithm removed the value
[]   because of too many apparent inhomogeneities occurring
[]   close together in time.
```

Quality Control Flag

```
BLANK = no failure of quality control check or could not be
        evaluated.

D = monthly value is part of an annual series of values that
    are exactly the same (e.g. duplicated) within another
    year in the station's record.

I = checks for internal consistency between TMAX and TMIN.
    Flag is set when TMIN > TMAX for a given month.

L = monthly value is isolated in time within the station
    record, and this is defined by having no immediate non-
    missing values 18 months on either side of the value.

M = Manually flagged as erroneous.

O = monthly value that is >= 5 bi-weight standard deviations
    from the bi-weight mean. Bi-weight statistics are
    calculated from a series of all non-missing values in
    the station's record for that particular month.

S = monthly value has failed spatial consistency check.
    Any value found to be between 2.5 and 5.0 bi-weight
    standard deviations from the bi-weight mean, is more
```

closely scrutinized by examining the 5 closest neighbors (not to exceed 500.0 km) and determine their associated distribution of respective z-scores. At least one of the neighbor stations must have a z score with the same sign as the target and its z-score must be greater than or equal to the z-score listed in column B (below), where column B is expressed as a function of the target z-score ranges (column A).

A	B
4.0 - 5.0	1.9
3.0 - 4.0	1.8
2.75 - 3.0	1.7
2.50 - 2.75	1.6

W = monthly value is duplicated from the previous month, based upon regional and spatial criteria and is only applied from the year 2000 to the present.

Quality Controlled Adjusted (QCA) QC Flags:

A = alternative method of adjustment used.

M = values with a non-blank quality control flag in the "qcu" dataset are set to missing the adjusted dataset and given an "M" quality control flag.

Data Source Flag

- Blank = Value was computed from daily data available in GHCN-Daily
- Not Blank = Daily data are not available so the monthly value was obtained from the USHCN version 1 dataset. The possible Version 1 DSFLAGS are as follows:
- 1 = NCDC Tape Deck 3220, Summary of the Month Element Digital File

2 = Means Book - Smithsonian Institute, C.A. Schott (1876, 1881 thru 1950)

3 = Manuscript - Original Records, National Climatic Data Center

4 = Climatological Data (CD), monthly NCDC publication

5 = Climate Record Book, as described in History of Climatological Books, U.S. Department of Commerce, Weather Bureau, USGPO (1960)

6 = Bulletin W - Summary of the Climatological Data for the United States (section), F.H. Bigelow, U.S. Weather Bureau (1912); and, Bulletin W - Summary of the Climatological Data for the United States, 2nd edition

7 = Local Climatological Data (LCD), monthly NCDC publication

8 = State Climatologists, various sources
B = Professor Raymond Bradley - Refer to Climatic Fluctuations of
United States During the Period of Instrumental Records, Brad
Contribution No. 42, Dept. of Geography and Geology, Universi
Massachusetts (1982)
D = Dr. Henry Diaz, a compilation of data from Bulletin W, LCD, a
Deck 3220 (1983)
G = Professor John Griffiths - primarily from Climatological Data

Most of these flags I ignore because they either won't change the annual averages or they are the consequence of an opinion. The only flag I care about is the **I** flag, meaning the reported Tmin is larger than the Tmax for that month. I'll report later how many flags there are in the example dataset I'll use.

The US Temperature Record 5: Preparing the Data

/ SEP 23, 2021

1. Chose the dataset you want to use. I use the raw data because as a chemist I learned to use the data I recorded, and any fiddling you want to do needs to be done in the model. I'll be comparing the data later in this series. As an example, I'll use the tmax.raw data. Grab the file from <https://www.ncei.noaa.gov/pub/data/ushcn/v2.5/> (about 5 MB), which has the .tar.gz extension. Most zip programs can open this, and you'll need to drill into the directory structure (four-levels deep!) and unzip the .txt files in its own directory. I named mine tmax.raw. It contains 1200+ files.
2. Concatenate all the files into a single text file named tmax.raw.txt by first opening a command line window (windows-R, "cmd", enter) and navigate to the folder you just created:

```
cd downloads
cd ushcn
cd tmax.raw
dir (to confirm files are there)
copy *.* Tmax.raw.txt
```

3. This creates a file, Tmax.raw.txt, which is about 18 MB long.
4. Import this data into a database program. I'll use MS Access, but libreBase works also. A spreadsheet won't work too well because we'll need to average all temperature readings for each year. The import function needs to define the columns of the data. Here is the list of the data columns, and there are a lot of them:

Variable -----	Columns -----	Type -----
ID	1-11	Integer
YEAR	13-16	Integer
VALUE1	17-22	Integer
DMFLAG1	23-23	Character
QCFLAG1	24-24	Character
DSFLAG1	25-25	Character
.	.	.
.	.	.
.	.	.
VALUE12	116-121	Integer
DMFLAG12	122-122	Character
QCFLAG12	123-123	Character

Variable Definitions:

ID: 11 character alphanumeric identifier:

- characters 1-2=Country Code ('US' for all USHCN stations)
- character 3=Network code ('H' for Historical Climatology Network)
- digits 4-11='00'+6-digit Cooperative Observer Identification Number

YEAR: 4 digit year of the station record.

VALUE: monthly value (MISSING=-9999). Temperature values are in hundredths of a degree Celsius, but are expressed as whole integers (e.g. divide by 100.0 to get whole degrees Celsius).

- Precipitation values are in tenths of millimeters, but are
- also expressed as whole integers (e.g. divide by 10.0 to
- get millimeters).

5. And repeat this process for any other datasets you want to graph. Create each in a new table of the database. You can save the import format (they call it the "import specification") so the subsequent imports are much easier than setting up the first. Each data table will be about 150,000 rows long, each representing one station's monthly averages for that year. What I did was build one import specification, then used that same "spec." for each dataset. They all have the same format. I'd name the resulting table as whatever it was (T_{\max} -raw, T_{avg} -TOB for example).
6. Now, they didn't make this easy. Whenever a value is not known, they used the value -9999. All those need to be changed to [null] using the search-and-replace function; just leave the new value blank. I needed to do that several times per table to get them all changed.
7. If you want to do what I'm doing by importing every dataset, plan to spend some time at it. The resulting .acddb file will be quite large, 325 MB. Maybe I'll update this file each year and make it available for download. Depends how well it compresses. These don't need to be updated often; the time base for climate change is very long, decades. Annual updates are more than often enough.

The US Temperature Record 6: Extracting annual averages using SQL

/ OCT 06, 2021

For our example I'm going to use Microsoft Access and the SQL language to make the create the yearly averages. This might also be very doable using a pivot table in Excel, but I don't know the intricacies of pivot table usage. In fact, pivot tables might be a great deal easier to use than Access/SQL, particularly if you can link the Excel data directly back to the .txt files, making the data refreshes each year very easy to do (well, you can do the same with Access, but I didn't).

In Access, we will now produce the annual averages for all stations in the U.S. using SQL, Structured Query Language. SQL is used to ask a database to produce specific data, and we will use the aggregate functions to get the averages over all stations.

It's actually more complex than that, because the thing we are aggregating is the yearly average,

```
([jan]+[feb]+[mar]+[apr]+[jun]+[jul]+[aug]+[sep]+[oct]+[nov]+[dec])/1200
```

Or as I designate the months columns in the Access database,

```
([M1]+[M2]+[M3]+[M4]+[M5]+[M6]+[M7]+[M8]+[M9]+[M10]+[M11]+[M12])/1200
```

Dividing by 1200 does two things: divides by 12 to get the annual average, and convert the temperature in centi-centigrade back to temperature in degrees centigrade (a "grade" being the difference in temperature between the freezing point and boiling point of water). So at this point we have a yearly average for each station for each year. This can be modified as

```
(([M1]+[M2]+[M3]+[M4]+[M5]+[M6]+[M7]+[M8]+[M9]+[M10]+[M11]+[M12])*9/5/100/12 + 32)
```

or

```
(([M1]+[M2]+[M3]+[M4]+[M5]+[M6]+[M7]+[M8]+[M9]+[M10]+[M11]+[M12])*0.0015 + 32)
```

to produce the temperatures in degrees Fahrenheit.

The aggregate function, `GROUP BY Year`, then averages all the years together to produce the single national average for all the annual averages.

The overall SQL statement is

```
SELECT t.Year, Avg(( [M1]+[M2]+[M3]+[M4]+[M5]+[M6]+[M7]+[M8]+[M9]+[M10]+[M11]+[M12] ) * 0.0015 + 32)
AS TavgRawAnnual
FROM [TAVG-RAW] AS t
GROUP BY t.Year;
```

and for precipitation,

```
SELECT t.Year, Avg(( [M1]+[M2]+[M3]+[M4]+[M5]+[M6]+[M7]+[M8]+[M9]+[M10]+[M11]+[M12] ) / 1200) AS
PRCPRawAnnual
FROM [PRCP-RAW] AS t
GROUP BY t.Year;
```

The name of the calculated column (here "TavgRawAnnual") and the table from which the data comes ("TAVG-RAW") need to be changes when using a different data set. I'm using an alias for the table name, "t," so that I don't need to change too much when I copy the SQL statement. This statement will produce a list of the nation-side average temperatures for each year. I create a query like this for each table I have. The data goes into an Excel sheet for graphing.

If you want the data for a particular month, the August highs each year, for example, you can simplify the query,

```
SELECT t.Year, Avg([M8] * 0.018 + 32) AS TmaxRawAugust
FROM [TMAX-RAW] AS t
GROUP BY t.Year;
```

The US Temperature Record 7: Graphing annual data in Excel

/ OCT 07, 2021

Copy and past the annual temperature averages from the Access query into an excel sheet.

You can use a "Scatter with Straight Lines" plot to display the data.

Here is a problem: the data from before 1890 is pretty sparse, and moves around a lot annually. To get a better representation of the trend, it's best to delete it. But that's up to you. What I do is select and cut the deviant data and paste it into the next-door column, so I can put it back if I need to. I'll talk about removing early data in a future post.

Then fit a linear trend, display the trend line and equation. The slope of the trend will be the trend in degrees Fahrenheit per year. If it's negative, the temperature trend is cooling. if it's positive, the trend is rising. Take the reciprocal ($1/x$) to get the trend slope in number-of-year-to-raise-one-degree.

Here is an example:



Or you can change the vertical axis to emphasize the ups-and-downs of the data:



I'm selecting the graph, right-click, Save as picture... to save these as .png files.

The US Temperature Record 8: Choosing a dataset

/ OCT 08, 2021

There are three USHCN datasets: RAW, TOB, and FLs.52j. I'll discuss what each is, and which I will use to observe the US Temperature record.

- RAW is the thermometer high and low recorded for each day, sent in on monthly station sheets. This is recorded as a high and low, T_{\max} and T_{\min} , and an average, $T_{\text{avg}} = (T_{\max} - T_{\min})/2$. The time of day is recorded, and the recording thermometer reset.
- TOB is raw temperature data corrected for the Time of OBservation, to place the high temperature on the correct day if the observation was recorded before the peak temperature of the day. This correction should have no effect on the monthly averages if the time of observation each day is consistent.
- FLs.52j is the result of the "pairwise homogenization algorithm," the PHA. This is version 2.5, 10th (jth) revision. This needs some explanation.

The PHA has been discussed in five papers from 2009 to 2013, all long, all complex. I'll do my best to tell you what they said. Here are the publications, available from the USHCN download site.

1. [menne-williams2009.pdf \(2.06 mb\)](#) Introduces the PHA
2. [menne-etal2012.pdf \(4.36 mb\)](#) Discusses the PHA-adjusted data from the Global Historical Data Network
3. [williams-etal2012.pdf \(1.61 mb\)](#) Benchmarking the PHA with fake data
4. [vose-etal2012.pdf \(1.08 mb\)](#) Compares the PHA data to six other PHA-adjusted datasets
5. [hausfather-etal2013.pdf \(801.33 kb\)](#) The effect of urbanization on increasing the PHA temperatures

1. Menne and Williams, *Journal of Climate*, **2009**, volume 22, page 1700.

“ Abstract:

An automated homogenization algorithm based on the pairwise comparison of monthly temperature series is described. The algorithm works by forming pairwise difference series between serial monthly temperature values from a network of observing stations. Each difference series is then evaluated for undocumented shifts, and the station series responsible for such breaks is identified automatically. The algorithm also makes use of station history

information, when available, to improve the identification of artificial shifts in temperature data. In addition, an evaluation is carried out to distinguish trend inhomogeneities from abrupt shifts. When the magnitude of an apparent shift attributed to a particular station can be reliably estimated, an adjustment is made for the target series. The pairwise algorithm is shown to be robust and efficient at detecting undocumented step changes under a variety of simulated scenarios with step- and trend-type inhomogeneities. Moreover, the approach is shown to yield a lower false-alarm rate for undocumented changepoint detection relative to the more common use of a reference series. Results from the algorithm are used to assess evidence for trend inhomogeneities in U.S. monthly temperature data.

On the assumption that some stations will change the temperature trend because something around the stations changed (land use changed which causes a jump in the trend, or the thermometer was replaced), the Pairwise Homogenization Algorithm will automatically detect and correct for the jump.

I have a problem with this. Which data set is the best, before the jump, or after? This is a problem with automated data corrections. And this can be a massive correction. Here is the opening paragraph:

“Discontinuities in a climate series can be induced by virtually any change in instrumentation or observation practice. The relocation, replacement, or recalibration of an instrument, for example, can lead to an abrupt shift in time-ordered observations that is unrelated to any real change in climate. Likewise, alterations to the land use or land cover surrounding a measurement site might induce a sudden or “creeping” change (Carretero et al. 1998; Karl et al. 1988) that could limit the degree to which observations are representative of a particular region. Such artifacts in the climate record ultimately confound attempts to quantify climate variability and change (Thorne et al. 2005). Unfortunately, changes to the circumstances behind a series of climate observations are practically inevitable at some point during the period of record. For this reason, testing for artificial discontinuities or “inhomogeneities” is an essential component of climate analysis. Often, the test results can then be used to adjust a series so that it more closely reflects only variations in weather and climate.

So, what size of discontinuity are we looking for? A new thermometer, or recalibrating the old, maybe a tenth of a degree. Changing the location of the weather station, maybe a degree, if you move it away from new black tarmac to grass. What size are they correcting? Fourteen degrees! These are massive corrections, as they demonstrate with data from a station in Colorado.

Here is what the PHA does:

The pairwise algorithm is executed according to the following six steps:

1. Select a set of "neighbors" for each "target" series in the network, and form pairwise difference series between the target and its neighbors.
2. Identify the timing of shifts in all target-minus-neighbor difference series using SNHT.
3. Verify each apparent shift identified by SNHT in the pairwise differences (e.g., does the apparent shift look more like a trend?).
4. Attribute the cause of shifts in the set of target-minus-neighbor difference series to the various "culprit" series.
5. Quantify the uncertainty in the timing of shifts attributed to each culprit series.
6. Estimate the magnitude of the identified shifts for use in adjusting the temperature series to reflect the true background climate signal.

It is the assumption behind step 6 that gives me the willies. The "true background climate signal" presupposes that there is a global or continental trend in temperatures, and they seem to be using the adjusted data to show what that "background climate signal" is. They might also be using the results of climate models with heavy CO₂ "forcings" (limits in the model by forcing the model to respond to changes in carbon dioxide levels, whether those changes are present or not) to generate that "background climate signal." We'll be testing this below.

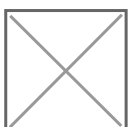
The consequence of either the presupposition or the forcing is that the climatologist using this model will need to judge how well the PHA did in "correcting" the data, and that depends *entirely* on whether or not they think the climate is changing. We have departed from empirical data, and have moved into the home of *experimenter bias*. This sequence of steps involves choice, and that choice, by a human, cannot be done without moving from observation to fantasy. An idea drilled into my head during my PhD in chemistry: never mess with the data beyond graphing it; only trouble lies beyond. I watched as Steven Ragsdale at Nebraska did exactly this and had to withdraw four papers, two from *Science*, the most prestigious science journal in the U.S. and two from the *Journal of the American Chemical Society*, the most prestigious chemistry journal in the world. You never mess with your primary observations and you trust what they tell you.

That they are on version 2.5 revision 10 shows they are messing with the adjustment a lot!

The PHA messes with the primary temperature observations. Let's see how much. Rather than try to critique each paper, which would take me many days and much explaining, let's just look at the data. I'll use the T_{avg} data, because that includes both the T_{max} and T_{min} observations.



And blow up the vertical axis to see the differences,



That is one crazy "adjustment." The TOB (in grey) has lowered the temperatures from 1890 through about 2004, mostly in the middle of the range, by about 0.6 °F. TOB correction should not have had this dramatic an effect. These are monthly averages, and adjusting the date by one should not have had this large an effect. I suspect they are using their "judgment" to chose which data to shift. You notice no changes by the TOB correction happen after 2004, when the network was digitized and reported each hour.

But the PHA adjustment (in blue) is massive! It's doing two things: dramatically (over ten degrees!) lowering the temperatures in the past, and raising the temperatures since 2004. My biggest problem is with any change happening after 2004 when the thermometers were all good and they had data each hour. Lets take a closer look at the differences, subtracting each adjusted dataset from the RAW observed dataset, where the x-axis represents the raw temperature data, so we can see just how big each adjustment is, year by year:



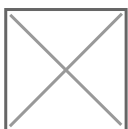
And zooming in,



No one can look at these corrections and say, "Oh, that's pretty reasonable." The 12 degree (!) adjustment before 1890 is just crazy, and must be false. That alone disqualifies this data set. But more disturbing is the rest of the correction they applied to the thermometer data to create the PHA dataset. The temperatures before about 2002 are all lowered significantly, and the temperatures after 2002 are all significantly raised, far beyond the thermometer observations. This makes the temperature curve look like it's warming significantly. The PHA adjustment to me looks like climate alarmist wishful thinking. It's just not real. It says that thermometers across the US in 2019 all read 1.2 degrees too low, or if only a subset of bad thermometers are out there, they are reading many degrees too low. The most recent data is the best thermometer data we have, and that correction is growing, not shrinking! That's just not believable.

The TOB adjustment looks hinky to me also, especially since they are making that adjustment well after the automation of the weather stations which report every hour. After automation by 1989, there should be no TOB correction; the adjustment is still there, which means they are adjusting something other than time of observation.

Is the PHA correction the wishful thinking of the climatologists? Lets look at the carbon dioxide concentrations in the air, measured at the Mauna Loa Observatory, Hawaii, as far back as they have measured:



The CO₂ curve is the same as the T_{PHA} - T_{RAW} curve! I think the PHA exists only to make the temperature record look like the CO₂ curve. The PHA is fake.

I'm going to use only the RAW dataset, the recorded thermometer reading. No fiddling, no adjustments. Just the thermometer readings.

Here is the data, the Access database and the Excel file: [USHCN2020.zip \(71.80 mb\)](#)

The US Temperature Record 9: Data Cleanup

/ OCT 09, 2021

I'll be using only the RAW datasets, the recorded thermometer readings, with no adjustments. Here they are:



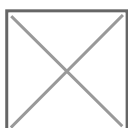
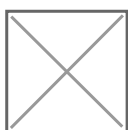
As you can see, there is quite a large variability at the beginning of the record, enough to throw off the slopes of the linear fit. I'm uncertain the best way to handle it. My first impression is to delete the record before 1890, after which the variability diminishes. T_{avg} and T_{min} are certainly being influenced by the pre-1890 data. Deleting that data gives us a good 130-year temperature timeline, minimally enough to see what's happening to the climate.

That's what I'll do before assessing the trends in the US temperature record.

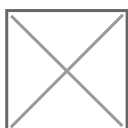
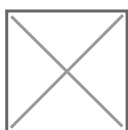
The US Temperature Record 10: The Trends

/ OCT 09, 2021

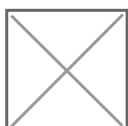
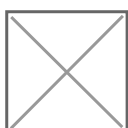
Finally, we are here. Previously I've explained how to find the data, get it into a database, pull the annual data out and into Excel for graphing, and which dataset is the most reliable, and how to clean up the pre-1890 data. Time to see the results!



High temperatures each day going up at a rate of one degree F every 280 years (or one degree C every 500 years).



The average temperatures are going up at a rate of one degree F every 450 years (one degree C every 820 years).



The low temperatures going up at a rate of one degree F every 200 years (one degree C every 350 years).

I probably should have bumped the cutoff up a few years, there are some big jumps at the beginning of two temperature trends.

Since the climatologists do this in degrees centigrade, so will I: averaged over the last 130 years,

- T_{MAX} : +1 °C/500 years
- T_{AVG} : +1 °C/820 years
- T_{MIN} : +1 °C/350 years

So there you go. The US is warming very slowly.

You'll notice some graphs have a rising trend after 1980. Let's look into that. All the graphs show a very steady drop in the 1970's. That drop ended in 1977, and prompted the "coming ice age" scare I remember back when I was a kid. I'll use that as my starting point to calculate the trend from 1977 to 2020, the last 43 years:

- T_{MAX} : +1 °C/6000 years
- T_{AVG} : +1 °C/130 years
- T_{MIN} : +1 °C/44 years

The high temperatures are flat, and the minimum temperatures are going up. The days aren't getting hotter, it's getting less cold at night! Summer days the same as they always were, and less snow and more rain during the winter. Nice! But the variability is returning to what we saw at the beginning of the 20th century. That's probably bad; I'm not sure, really.

By comparison, the last 43 years of the PHA data has:

- T_{MAX} : +1 °C/36 years
- T_{AVG} : +1 °C/36 years
- T_{MIN} : +1 °C/35 years

Curious, if it was real. All the same number; an artifact of the PHA, no doubt.

And this completes the series. Thanks for reading!

“ That is the way of the scientist. He will spend thirty years in building up a mountain range of facts with the intent to prove a certain theory; then he is so happy with his achievement that as a rule he overlooks the main chief fact of all—that all his accumulation proves an entirely different thing.

— Mark Twain

'The Bee'. In *What is Man? and Other Essays?* (1917), p. 283

P.S. Again, this might be doable using a pivot table in Excel, but I know SQL better than I know Excel so that's the example you got.

The US Temperature Record 11: RealClimateTools.com

/ MAY 11, 2022

Tony Heller, at RealClimateScience.com, has put up a very nice data website, RealClimateTools.com, to help us look at thermometer data over the years. He is using the raw daily thermometer reports (T_{\max} , T_{\min} , Precipitation, and Snow (not sure how that's measured, daily snowfall or total depth)).

You can look up the data by station and move the graph around to do a graphical selection. For example, using my closest stations, Utah Lake Lehi and Spanish Fork Powerhouse Mountain, I can look at the average T_{\max} before and after 1970 when the carbon-driven warming is supposed to have started.

Utah Lake Lehi Before 1970 = 62.57 average, after 1970 = 62.82

Spanish Fk Pwr House before = 65.29 average, after 1970 = 64.83

Interesting, one 0.3 degrees higher, one 0.5 degrees lower. There is a lot more variability than the conglomerated data suggests.



You can also examine the number of days above or below a certain limit by sliding the data up or down. At the Lehi station, the average number of days per year above 96 F has gone up from 3.4 to 6.0 a year after 1970. At the Powerhouse station the hottest days dropped from 20.0 to 17.7 a year.

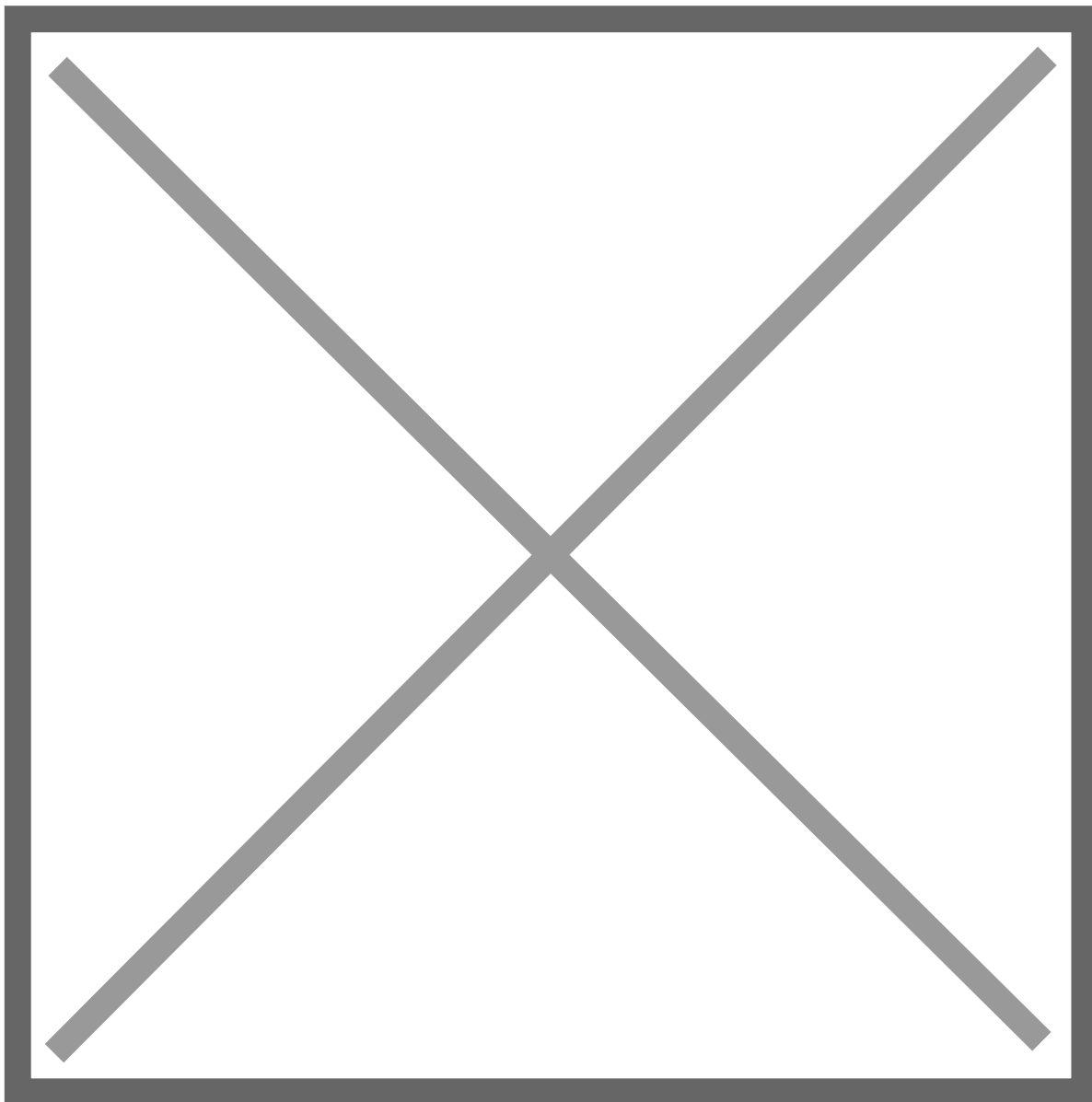
I suspect Tony will be adding additional measuring tools over time, like trendlines, but it's fun to see the data, finally. It probably took him a lot of work to get it up and running.

Thanks, Tony!

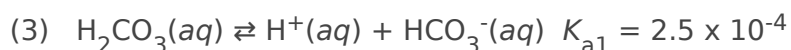
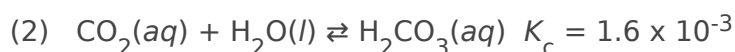
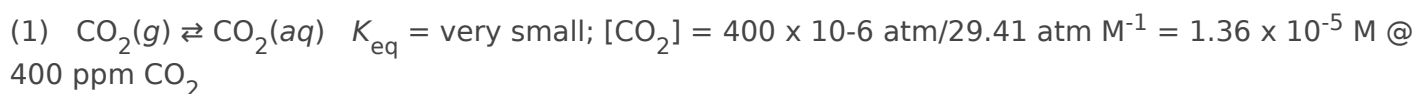
More Scientific Fraud Identified

/ AUG 10, 2022

Science magazine [reports](#) that a marine biologist at the University of Delaware has committed scientific fraud by making up data supporting the idea that increasing the carbon dioxide concentration in the atmosphere will increase the pH of ocean waters enough to affect the behaviors of marine wildlife. This is a big deal, because so many subsequent reports "confirm" this, in dozens of papers, while much [replicating research did not](#). And all these reports made it into the press because they confirmed the climate change story/myth/theory. And now it's all being knocked down. The coral and the fish, it seems, are quite safe.

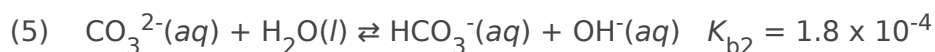
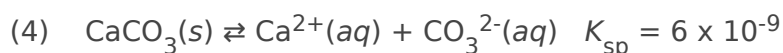


When these reports first surfaced I talked about them with my students, my freshman chemistry students, about the possibility that CO₂ could influence the pH. Here is the problem with that idea: The carbon dioxide is part of the equilibrium. That means it *can't*, by definition, have any major effect whatever on the pH. Here are the reactions, with associated equilibrium constants, starting with a Henry's Law calculation at 400 ppm CO₂:

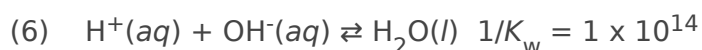


It is [here](#) that most climate change people stop the calculation, perhaps because at this point, and with sufficient ignorance, it appears that more CO₂ means more H⁺ and more acidity. By combining the two equilibria into an overall equilibrium ($K_c = 4.0 \times 10^{-7}$) and using the concentration of CO₂ (aq), they get a pH addition of $+1.3 \times 10^{-5} \text{ M H}^+$. This is a pH of 4.9. And this acidification would have been happening ever since there was carbon dioxide in the atmosphere, which is the entire life of the planet! The oceans should be totally acidified by now.

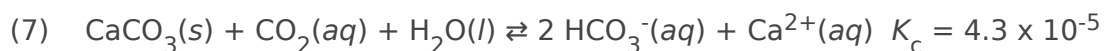
The pH of the ocean is 8.1. Which is basic. Not acidic. And adding a pH of 4.9 would make the ocean far more acidic. The failure is when they don't ask: why is the ocean alkaline? Here's why:



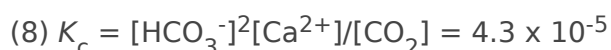
Carbon dioxide acidifies, and calcium carbonate creates basic conditions, but in reality they are in equilibrium with each other, to complete the cycle with the reaction of H⁺ and OH⁻ to make water:



Add all the reactions together and form the equilibrium expression for the system:



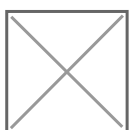
with $[\text{CaCO}_3(s)] = 1$, $[\text{CO}_2(aq)] = 1.4 \times 10^{-5} \text{ M}$, $[\text{H}_2\text{O}(l)] = 1$, making the concentration of the hydrogen carbonate ion dependent system dependent on dissolved carbon dioxide and calcium ion concentrations. And temperature (I haven't tried to find all that data; I've used the 25 C values):



This ignores calcium ion sinks like CaOH⁺, but I'll explain why in a bit.

So there is a constant source of carbon dioxide (the atmosphere), and a constant source of calcium carbonate (all the shells of living wildlife in the ocean, and their dead skeletons), and both of those also work as sinks of CO₂ and CO₃²⁻. Both are in equilibrium with species which are not in the pH

equilibrium (the gaseous carbon dioxide and the solid calcium carbonate). The calcium ion concentration, it seems, is the most sensitive part of the equilibrium, but it is always a very constant concentration (close to 10^{-4} M). So why do I discount the possible variability of calcium ion concentrations? Because it is being actively incorporated into the skeletons and shells of marine life. Active incorporation means they can drive the system toward non-equilibrium by using chemical energy, absorbing calcium in all its soluble forms, including the CaOH^+ ion. Sea-life is dependent on that calcium to build shells and marine life spends a lot of energy gathering it up. The main chemistry of the ocean is all about the calcium ion; it's the limiting reagent for marine life (well, that and phosphate ion). If life is present, the calcium concentration will be driven down to a value about 10^{-4} M, when more calcium carbonate dissolves, releasing hydroxide ion, which helps more carbon dioxide dissolve to provide more hydrogen carbonate ion. Ocean pH levels are all about the calcium ion concentrations. Here is a graph of the equilibrium system, taken from a soil science lecture [here](#):



See that dip in the Ca^{2+} concentrations, the open circles? That dip is why the ocean pH doesn't change. Marine animals actively absorb the calcium ions to minimize its concentration, then the rest of the equilibrium system responds. When CO_2 is more abundant, so are ocean plants, feeding the animals which grow, so calcium is absorbed, more calcium carbonate dissolves, and we are back to equilibrium, pH 8.1. Adding calcium ions to the water won't help, it just shifts the equilibrium momentarily to feed the animals until the ion concentrations drop back down or by precipitation of the excess calcium ions, pH 8.1. The animals are in charge of this system, so long as they absorb the calcium ions. Do *anything* to shift the pH, and more marine life is the consequence. It's a beautiful system.

I didn't have this graph when I explained it to my students, but I knew this is what water chemistry does with carbon dioxide and calcium carbonate both present. It's right there in the equilibrium reactions.

So the big question: why did none of these reviewers, nor the reviewers for all the dozens of papers which followed these, not pick up on this obvious consequence of equilibrium? I am utterly baffled as to why.

I've seen similar behavior in smaller studies, when spectroscopic peaks were picked from a graph that were obviously noise (papers later withdrawn from *JACS* and *Science*). Why did no one pick up on the wrongness of the interpretation? Peer review isn't this difficult. My suspicion: fraud is accepted in academia. "I'll let your paper slide into print if you let mine." It is *not* a beautiful system.

Once again, rely on the data, ignore the theory. Robert Boyle was right. Every damn time.

The Death of Man-Made Climate Change: the last nail is in the coffin, so why didn't it die?

/ MAY 14, 2023

Fifteen months ago a paper was published which scientifically killed the idea of man-made climate change. Kenneth Skrable, George Chabot, and Clayton French at the University of Massachusetts Lowell published (*Health Physics* [122\(2\):p 291-305, February 2022](#)) an analysis of the NOAA carbon isotope data which has been collected since 2003. I honestly thought this research had been done dozens of times and was inconclusive. I was wrong.

The Research

The amount of carbon dioxide in the air has gone up, from 280 ppm (parts per million) in the mid-1700s to 410 ppm, a 46% increase

Carbon in CO₂ comes from three sources: living matter decaying to release the CO₂, carbon created in nuclear reactions turning nitrogen into carbon high in the atmosphere (not very much), and carbon that we dug up and burned in air to produce energy and anthropogenic ("man-made") carbon dioxide. The carbon from those nuclear reactions always comes as the radioactive carbon-14 isotope, and it keeps the carbon in carbon dioxide at 1.1% carbon-14. Carbon from underground, since it's been there a very long time, has no more carbon-14 left; it's all carbon-12. The carbon from decaying matter is recent enough that it is also that 1.1% carbon-14. By examining the ratios of carbon-12 and carbon-14 an estimate can be made of the amount of carbon-12 added to the atmosphere by man burning fossil fuels.

It's 11.6% of the 2018 total, according to the NOAA data. Or about 48 parts per million (ppm) of the current increase of +130 ppm. One third of the increase of CO₂ in the atmosphere.

Now here's the problem for the story of anthropogenic fossil fuel production of carbon dioxide causing climate change: it's gone up 130 ppm. Less than half is caused by us. Why is this a problem for man-made climate change? Because a one-third (or one-half) increase isn't enough for the climate models to produce any change, so it proves the climate models are all wrong, along with the predictions. And the bigger problem is we hear only silence where they should be explaining where the other two-thirds of the increased CO₂ came from. Satisfyingly, though, it does explain why the model predictions keep not happening.

To quote the authors,



Our results show that the percentage of the total CO₂ due to the use of fossil fuels from 1750 to 2018 increased from 0% in 1750 to 12% in 2018, much too low to be the cause of global warming.

To be the cause the percent must be 46%. So that's the final nail in the coffin. Any climate change we see isn't caused by fossil fuels. Attribute it to the solar cycles, to chaotic variations of weather, wherever, but it's not from fossil fuels.

But The Corpse is Still Alive

So why is global warming still a thing? That's the \$1M question.

Possible reasons:

1. Global warming activists (they must be called that now) don't care about science.
2. Global warming activists like global warming so much they defy science to keep believing.
3. Global warming activists can't, or won't, read.
4. Global warming activists are in it for some other reason.

I'll address each option.

Global warming activists don't care about science.

But they do care about science, at least the science that supports their position. It's probably a form of confirmation bias. If you're not a scientist, confirmation bias can sustain a belief very well. If you are a scientist than it can't. And scientists like Michael Mann have not backed off their beliefs at all. So even when they do care, it doesn't matter. So this gets a check mark.

Global warming activists like global warming so much they defy science to keep believing.

This seems likely to me. They appear not to like the consequences, but they clearly love to talk about the disaster in the offing, and probably love feeling "right." This gets back to my previous posts and presentations about alchemy believing for 2000 years ideas which never worked: they liked the story so much it was very difficult for them to drop it. Even after alchemy was dead it took another 100 years before chemistry was being done. Very likely; big checkmark.

Global warming activists can't read.

An absurd assertion, which I reject.

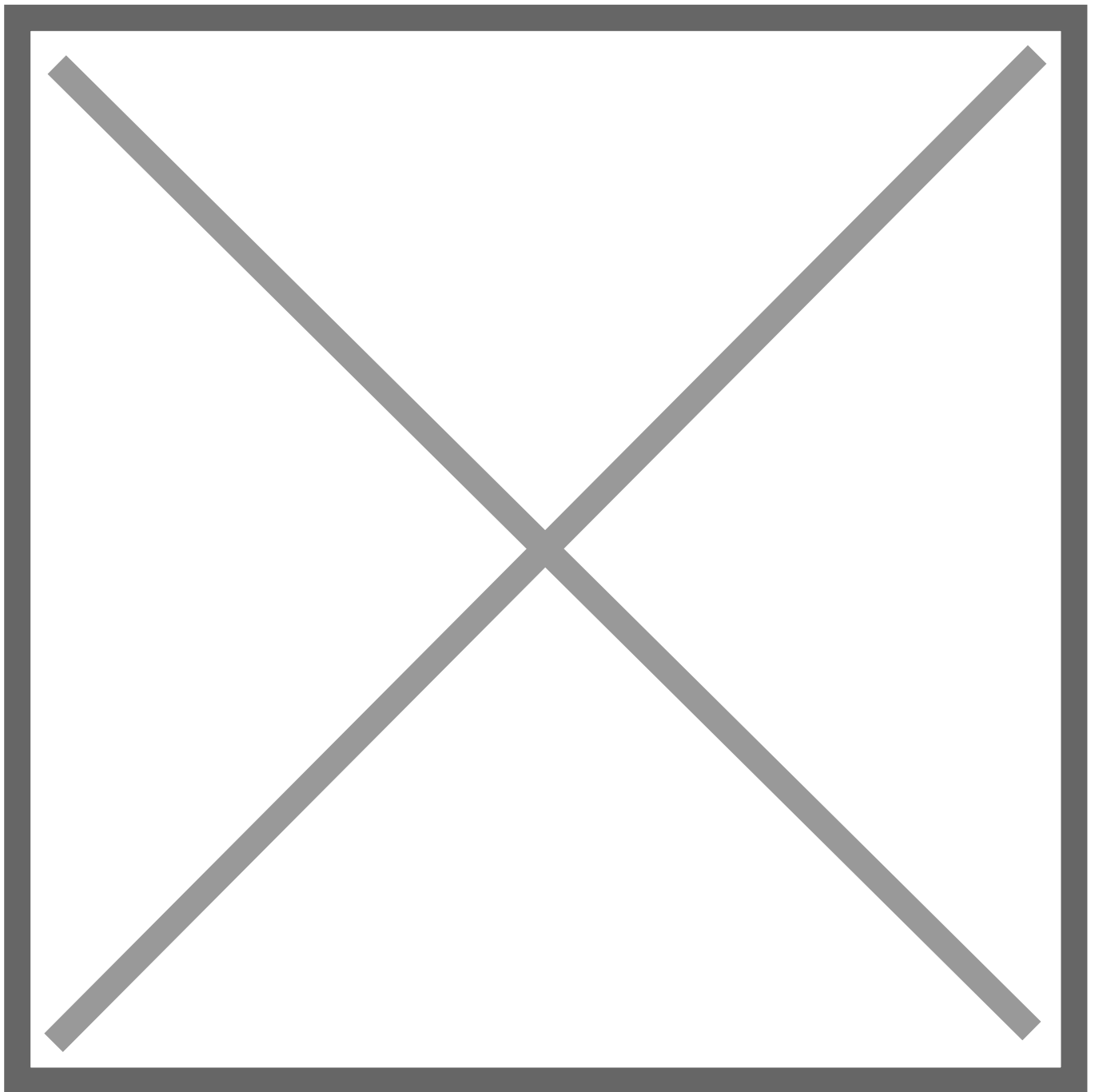
Global warming activists are in it for some other reason.

Almost certainly true, given the certainty of the believers. What do they get? Money? Social status? Friends? All are strong drivers of beliefs. Huge check mark.

Does this mean we reject the global warming activists? Not really, because of all these things, none are malicious, they are just being human. We all do this stuff, supporting our beliefs for a variety of reasons, some are good beliefs, helpful to ourselves and to others; other times we believe things that harm ourselves and others, or just ourselves, or just others. But it's a human thing to do.

I have no idea how to distract them from this belief, or get them to take science seriously even when it goes against their expectation.

So I write blogs which might get read. Like the authors wrote a paper which might change the discussion. I hope that this blog helps. The authors hope their work might change the discussion. We all live in hope.



The Return of Natural Philosophy

/ JUL 30, 2023

“ Empiricism: using observation as the only developer of scientific theory; no need to explain why a theory is so, and a massive dose of skepticism regarding any theory and explanation; *Nullius in verba* "Take no one's word for it."

“ Natural philosophy: The belief (like a religion) that there is some purpose beneath the behavior of nature, a belief strong enough that it alters and guides observation, leading to a distrust of observation and exaltation of the theories.

Over time mankind has swung back and forth between these two opposites.

10,000 B.C - 600 B.C.: For most of history empiricism was all we had. Practical arts and crafts, producing dyes, metals, glass and beads, pottery. Of these we have only artifacts, no written text describing any of it.

600 B.C. - 1660 A.D.: Beginning with Thales of Melitus and including all Greek philosophers, peaking at Plato and Aristotle (384 - 322 B.C.), and continuing until the formation of the *Royal Society of London*, everyone followed the natural philosophers. These are half mythology and half poor observation to form a description, a creation story, an all-encompassing mythology that explains why everything is as it appears, and how it came to be. Aristotle wrote books and books of his natural philosophy, and he was a good writer. His ideas were believed for millennia. And they were all wrong. Flies have eight legs. Horses have 24 teeth. Men have more teeth than women. Metals are made in the earth through the combination of moist and dry vapours. All wrong. But he made a good story of it, and that story was enough. We love a good story, and remember them. So people remembered his good stories.

1536: Petrus Ramus (*Pierre de La Ramée*, or just Peter Rami) writes a dissertation *Quaecumque ab Aristotele dicta essent, commentitia esse* (*Everything that Aristotle has said is false*), for which he is later killed by an Aristotelian Catholic. But someone has finally said it.

1660: Robert Boyle and his friends, who style themselves the *Invisible College* (because they are in a pub, not a college) and some faculty from Gresham College form the Royal Society of London to produce fact. This is a pivotal moment in the development of science, because they want desperately to get away from natural philosophy and back to reality. The *Society* is there to host

experimenters and witnesses to establish clear fact; the register cannot be signed unless the experimenter can say in a short phrase what fact he has demonstrated. The motto of the *Society*: *Nullum in verba*, "take no one's word for it." This motto is a clear statement of the empirical way of science: "I'll never take your word for anything; you must demonstrate fact, and I'll trust that if I (or someone I trust) observes, but anything else you say doesn't matter, I can draw my own conclusions." This motto presupposes that we have read and experienced enough to make sense of the demonstrated fact. If not, have another beer and don't get into science.

1950: After *special relativity*, *general relativity*, and *quantum theory* began to settle on the minds of scientists, they were drawn back to the natural philosophy as an explanation. Reasonably, I think, because those are such difficult concepts to master and stories help in understanding them. In 1950 Edwin Schrödinger (quantum theory) and Albert Einstein (both relativities) wrote letters back and forth trying to work out the empirical nature of quantum theory. They were dealing with one main question: can a quantum effect have any impact on reality? Together they come up with an apparatus that uses a quantum effect (a 50% probability effect, the decay or non-decay of a single radioactive atom) which will cause a detector to trigger a mechanism that will kill a cat (the observable reality). This is what *Schrödinger's Cat* is all about. They arrive at no conclusion, other than to demonstrate the silliness of the superposition aspect of *matrix mechanics* and the vast preference for Schrödinger's *wave mechanics*. But alas, the damage was already done: natural philosophy could not be stopped by some letters.

We are back in the age of natural philosophers. Natural philosophers don't spend much time in observation, they tell others what should be happening. That's an important word, *should*. It's a moral word, not describing nature, but describing how we anticipate what will happen. Predictions are an important part of what you do with observations. Successful predictions indicate we have observed accurately and have done well in describing them. *Shoulds* work differently. Since the *should* is believed, any violation of the expectation is wrong, and wrong data can easily be ignored or modified to make it conform to the *should*. I see far too much "science" being done this way, certainly *everything* leaning into propaganda. Antinuclear, climate change, organic, eating bugs, fossil fuel use come immediately to mind. None of it supported by empiricists, but by natural philosophers, particularly when they make it out to those talking to the public, the activists. They are pure natural philosophers.

Mototaka Nakamura, a climate scientist for 25 years, realized in 2019 that they weren't doing science anymore when they modeled the climate and made their predictions. He wrote it up in *Confessions of a Climate Scientist: The Global Warming Hypothesis is an unproven Hypothesis*, published on Kindle (\$0.99 at the time of writing, in Japanese with an English version embedded within). From 1990 - 2014 he worked on the driving mechanisms for medium-scale, large-scale, and planetary-scale flow in the atmosphere and oceans (mass and heat, mostly). He realized the importance of nonlinear fine-scale phenomena in large-scale processes that weren't being modeled, like the dynamics of cloud formation. He became skeptical of the "global warming hypothesis" because of the catastrophic predictions, not the measured temperatures, which he says remains at 0.5 degrees K higher in 2019. His thesis: "I am simply pointing out the fact that that it is impossible to predict with any degree of accuracy how the climate of the planet will change in the future." He attributes this impossibility to not knowing how the solar input will change, nor how man-made carbon dioxide output will change in the future. In other words, it's the

non-measurable part of the model that bothers him. A lot. He is bothered by the lack of good data for global weather, using instead the limited regional weather (America, Europe, and India) as representative of the globe, when we have strong evidence that regional changes do not follow global patterns. So in the absence of empirical data, climate scientists have created theories (models; Nakamura calls them hypotheses) to do all the explaining, then trust those models above the empirical data. Climate scientists have become pure natural philosophers again, and like Aristotle, everything they say is wrong. Nakamura's short book is a good read on where the climate modeling fails, the largest being solar energy input and the total unpredictability of cloud cover. The author has left climate science, with this book accounting for what climate science is doing his last climate activity.

Scientific papers generally have four sections: introduction, experimental, results, and discussion. A hundred years ago the discussion section was the shortest by far. Now in every paper I read it is the longest, sometimes by far. It is the discussion section the Royal Society said not to trust. I think it can be thrown away; if the experiment is so poorly done and reported that the reader can't figure out by themselves what it means, then don't publish until it's done right. Subtle, difficult, needed-to-be-argued science isn't good science, it's propaganda for the authors lab. For heaven's sake don't publish that crap.

“ If the experiment is so poorly done and reported that the reader can't figure out by themselves what it means, then don't publish until it's done right. Subtle, difficult, needed-to-be-argued science isn't good science, it's propaganda for the authors lab.

Long live empirical science! Maybe this climate science thing will reveal the flaws and start a movement back to pure empiricism.



The Stupidity of the Climatists

/ DEC 26, 2023

One primary method of being stupid is to do things that bring you to a state opposite of your intentions. Like wanting higher crop yields so you kill all the birds that eat seeds, and discover that they also eat the bugs that consume the crops so in the end your yields plummet. Then doing it again the next year. Brought to you by the idiots running of Maoist China.

We have the same thing happening in the climate change crowd.



IPCC AR6 WG2 FAQ16.5.1

This is a "burning ember" diagram. Nothing about it is based on observation. It's all speculation, with colors chosen to scare you. This particular working group has five "reasons for concern." Four of them presumably affect the quality of life for humans, by killing them. And the recommendation for mitigating these events? Restrict energy production and availability.

Here's the problem: if quality of life is the goal, we know well how to accomplish that: cheap and available energy. We've known that since the mid-1800s as the driver of the industrial revolution. So why destroy a guaranteed huge driver of quality of life to avoid the low-confidence possibility of bad events? Because climatists are stupid. From the best intentions they will hurt you and themselves, and keep doing it.

Climatists are the followers of an ideology that the weather of the late 1800s was perfect, even though they can't tell you what that weather actually was, and that it must be attained at any cost.

Here is my list of the three most important things that affect the quality of life, some not so proven:

1. Having two parents of opposite gender, so there is enough care for the kids and examples of both male and female behaviors to emulate. This is very visible in social surveys.
2. Having available and inexpensive energy.
3. Having a robust capitalist economy with little regulation.

Missing from the list: giving power to idiots who have it backwards. For example, NOAA, tracking the weather, finds that heat kills 134 people a year, while cold kills 30. But the CDC, who track deaths, not storms, has cold killing 1300 a year, while heat kills 670. So if lower weather-related mortality is the goal, higher temperatures are desired over lower. But what else would you expect from the people who said, "Hey, let's not use thermometers which have been in place for 150 years to measure the temperature, let's measure it from 200 miles away, from space!" Keep *them* away from policy!

Vikek Ramaswami is right, "Burn, baby, burn!"

EDIT (Feb 2024):

I found a quote from Ross McKittrick on the topic:

“ I abhor Earth Hour. Abundant, cheap electricity has been the greatest source of human liberation in the 20th century. Every material social advance in the 20th century depended on the proliferation of inexpensive and reliable electricity. Giving women the freedom to work outside the home depended on the availability of electrical appliances that free up time from domestic chores. Getting children out of menial labour and into schools depended on the same thing, as well as the ability to provide safe indoor lighting for reading. Development and provision of modern health care without electricity is absolutely impossible. The expansion of our food supply, and the promotion of hygiene and nutrition, depended on being able to irrigate fields, cook and refrigerate foods, and have a steady indoor supply of hot water. Many of the world's poor suffer brutal environmental conditions in their own homes because of the necessity of cooking over indoor fires that burn twigs and dung. This causes local deforestation and the proliferation of smoke- and parasite-related lung diseases. Anyone who wants to see local conditions improve in the third world should realize the importance of access to cheap electricity from fossil-fuel based power generating stations. After all, that's how the west developed.

The whole mentality around Earth Hour demonizes electricity. I cannot do that, instead I celebrate it and all that it has provided for humanity. Earth Hour celebrates ignorance, poverty and backwardness. By repudiating the greatest engine of liberation it becomes an hour devoted to anti-humanism. It encourages the sanctimonious gesture of turning off trivial appliances for a trivial amount of time, in deference to some ill-defined abstraction called “the Earth,” all the while hypocritically retaining the real benefits of continuous, reliable electricity. People who see virtue in doing without electricity should shut off their fridge, stove, microwave, computer, water heater, lights, TV and all other appliances for a month, not an hour. And pop down to the cardiac unit at the hospital and shut the power off there too.

<https://www.rossmckitrick.com/earth-hour.html>

Activist Science

/ FEB 20, 2024

A short post today: What is the difference between an activist scientist employed by an agency and a commercial employed by a business?

One needs to be amazing to keep their job, the other has to be right to keep their job.

So which science do you trust?

Looking for a nice image to go here, I found [this](#). When 2200 members of the Union of Concerned Scientists Science Network were asked "how often should scientists be politically active in their professional activities?", an astounding 0.9% said "never." 99.1% thought activism should be part of their professional activities. So in my mind, 99.1% of them produced junk science because they are motivated by the wrong thing: changing the world to what they want.

Scientists measure the world as it is; when alternative motivations enter, they measure the world by what they want to be. It explains all the fiddled thermometer data, all the bad graphs, all the nonsensical conclusions. All the junk science.

Activism produces crap. It becomes propaganda for the stupids.

Corporate science is driven by reality: goof up the science and you goof up the company profit margin, and out you go. Corporate scientists need to be firmly anchored in reality. Though there is the possibility that by lying the corporate scientist will support a higher profit margin, few companies will risk the devastating exposure of science fraud. It has been risked, and discovered, and industries hit hard in the aftermath. But I trust corporate science way over all other types of science.

What of academic science? Were it not for the old professors, and the young professors, and the post-doctoral scientists, and the graduate students, and the undergraduates, I'd trust it. Old professors are ossified with old ideas, and don't really develop new science. They concentrate on reinforcing their own early ideas which weren't accepted. Young professors need rank advancement, and the university public relations office needs fodder to brag on, so they'll take any overblown claim as fact. Postdocs and graduate students need a career job, and the more noteworthy they are the better position they'll get. Fraud is blamed on the major professor, so they can get away with fraud, and being highly incentivised to commit fraud, they frequently do. And undergraduate scientists are just clueless.

So who in academia can do good science? I don't know, and good science is rare here.

So who do I trust most: corporate science. By far.

Everyone else, especially the activist scientist, reminds me of this kid, wearing his safety goggles on his forehead. An enthusiastic effort, but doing it wrong.

