

INTRODUCTION TO TEMPERATURE DATA TIMELINE

Virtually every month and year we see reports that proclaim the current global temperature data to be among the warmest in the entire record back to 1895 or earlier.

But the efforts to assess global changes in temperature are very young and beset with many issues.

The first effort to actually measure global atmospheric temperatures began with the help of satellite infrared sensing in 1979.

For the U.S., monthly surface temperature data acquisition began in the late 1980s. The first attempts at developing estimates of Global Average Surface Temperature began in 1992. However, due to the lack of raw data over much of the planet, these global datasets are products of simulation models and data assimilation software, not solely real data.

One of the key issues is Spatial Bias - the density of observation stations varied greatly on the global scale. Dr. Mototaka Nakamura in his book *“Confessions of a climate scientist: the global warming hypothesis is an unproven hypothesis”* writes that over the last 100 years “only 5 percent of the Earth’s area is able show the mean surface temperature with any certain degree of confidence. “A far more serious issue with calculating ‘the global mean surface temperature trend’ is the acute spatial bias in the observation stations. There is nothing they can do about this either. No matter what they do with the simulation models and data assimilation programs, this spatial bias before 1980 cannot be dealt with in any meaningful way.”

On top of this spatial bias:

- Missing monthly data from existing stations for 20-90% of the stations globally requiring model infilling, sometimes using data from stations hundreds of miles away.
- Station siting not to specifications (US GAO found 42% U.S. stations needed to remedy siting) with serious warm biases.

- Airport sensor systems were designed for aviation use, not climate change analysis - allowing temperature errors up to 1.9F.
- Adjustments to early record occur with every new update, each cooling early data in the record, causing more apparent warming. Dr. Nakamura blasts the ongoing data adjustments: “Furthermore, more recently, experts have added new adjustments which have the helpful effect of making the Earth seem to continue warming”. He deems this “data falsification”.
- Oceans which cover 71% of the globe (81% of the Southern Hemisphere) had data limited to shipping lanes, mainly in the northern hemisphere until 50km nighttime satellite ocean skin temperatures measurement became available after 1984 and the ARGO 4000 buoy global network after 2000.

Attempting to compile a ‘global mean temperature’ from ever changing, fragmentary, disorganized, error-ridden, geographically unbalanced data with multi-decadal evidence of manipulation does not reach the level of the IQA quality science required for climate change policy-decision making.

Government analysts went from recognizing the serious observation limitations into the late 20th century to making claims that state with confidence how each month’s temperature ranks, back into the 1800s, for the US and the globe to tenths of a degree.

Landmark studies (Wallace et al) were published which proved conclusively that the steadily rising Atmospheric CO₂ Concentrations had [no statistically significant impact](#) on any of the 14 temperature time series (at the surface and in the atmosphere) and showed the so called greenhouse induced [Tropical Hot Spot](#) caused by rising atmospheric CO₂ levels, simply does not exist in the real world.

Dr. Nakamura [commented at NTZ](#): *“So how can we be sure about the globe’s temperatures, and thus it’s trends before 1980? You can’t. The real data just aren’t there. Therefore, the global surface mean temperature change data no longer have any scientific value and are nothing except a propaganda tool to the public.”*

The most prudent step to take for America would be to focus on satellite data and CRN and USRCRN, if funded, for land and ARGO buoy data for the oceans. Then, over the next few decades, temperature changes and their causes could be accurately accessed before taking radical steps to cancel our country's long sought and finally achievable energy independence.

Temperature Measurement Timeline Highlights

1975 – National Academy of Science makes first attempt at determining global temperatures and trend, which was limited to the Northern Hemisphere land areas (U.S. and Europe). This was because reliable data on a larger scale and over the ocean was just not available or trustworthy. The data able showed a dramatic warming from the 1800s to around 1940 then a reversal to a cooling that by the late 1970s had the CIA warning that the consensus of scientists were worried about heading towards a dangerous new ice age. The cooling through the late 1970s roughly eliminated the nearly 60 years of prior warming.

1978 - [New York Times](#) reported there was too little temperature data from the Southern Hemisphere to draw any reliable conclusions. The report they references was prepared by German, Japanese and American specialists, and appeared in the Dec. 15 issue of Nature, the British journal. It stated that *“Data from the Southern Hemisphere, particularly south of latitude 30 south, are so meager that reliable conclusions are not possible. Ships travel on well-established routes so that vast areas of ocean, are simply not traversed by ships at all, and even those that do, may not return weather data on route.”*

1979 –satellite -based global atmospheric temperature measurement begins at UAH and RSS.

1981 - NASA's James Hansen et al reported that *“Problems in obtaining a global temperature history are due to the uneven station distribution, with the Southern Hemisphere and ocean areas poorly*

represented,” (Science, 28 August 1981, Volume 213, Number 4511([link](#)))

1989 - In response to the call for an accurate, unbiased, modern historical climate record for the United States, personnel at the Global Change Research Program of the U.S. Department of Energy and at NCEI defined a network of 1219 stations in the contiguous United States whose observation would comprise a key baseline dataset for monitoring U.S. climate.

Since then, the USHCN dataset has been revised several times (e.g., Karl et al., 1990; Easterling et al., 1996; Menne et al. 2009). The three dataset releases described in Quinlan et al. 1987, Karl et al., 1990 and Easterling et al., 1996 are now referred to as the USHCN version 1 datasets.

The documented changes that were addressed include changes the time of observation (Karl et al. 1986), station moves, and instrument changes (Karl and Williams, 1987; Quayle et al., 1991). Apparent urbanization effects were also addressed in version 1 with a specific urban bias correction (Karl et al. 1988)

Tom Karl wrote with Kukla and Gavin in a 1986 paper on [Urban Warming](#): *“MeteoSecular trends of surface air temperature computed predominantly from [urban] station data are likely to have a serious warm bias... The average difference between trends [urban siting vs. rural] amounts to an annual warming rate of 0.34°C/decade (3.4C/century) ... The reason why the warming rate is considerably higher [may be] that the rate may have increased after the 1950s, commensurate with the large recent growth in and around airports. Our [results](#) and those of others show that the urban growth inhomogeneity is serious and must be taken into account when assessing the reliability of temperature records.”*

1989 - The NY Times reported the US Data *“failed to show warming trend predicted by Hansen in 1980.”*

1992 – NOAA’s first global monthly assessment began (GHCNm - Vose). Subsequent releases include version 2 in 1997 (Peterson and Vose, 1997), version 3 in 2011 (Lawrimore et al. 2011) and, most

recently, version 4 (Menne et al. 2018). For the moment, GHCNm v4 consists of mean monthly temperature data only.

1992 - The National Weather Service (NWS) Automated Surface Observing System (ASOS), which serves as the primary data source for more than 900 airports nationwide was deployed in the early 1990's. Note the criteria specified a root-mean-square-error of 0.8F and max error of 1.9F. ASOS was designed to supply key information for aviation such as ceiling visibility, wind, indications of thunder and icing. They were not designed for assessing climate changes.

1999 - The USHCN temperature still trailed 1934 as it had a decade earlier - James Hansen noted "*The U.S. has warmed during the past century, but the warming hardly exceeds year-to-year variability. Indeed, in the U.S. the warmest decade was the 1930s and the warmest year 1934.*" When asked why the discrepancy with record setting global temperature data, Hansen said the US was only 2% of the world and both could be right.

2000 – A network of nearly 4000 diving buoys (ARGO) were deployed worldwide in an attempt to provide the first real time high resolution and reliable monitoring of ocean temperatures and heat content.

2004 – National Climate Reference Network was launched with guidance from John Christy of UAH who managed the pilot network in Alabama to provide uncontaminated temperatures in the lower 48 states. The 114 stations met the specifications that kept them away from local heat sources. It should be noted the CRN network showed no warming from inception in 2004 through 2020.

2005 - Pielke and Davey (2005) found a majority of stations, including climate stations in eastern Colorado, did not meet requirements for proper siting. Importantly, they extensively documented poor siting and land-use change issues in numerous peer-reviewed papers, many summarized in the landmark paper "Unresolved issues with the assessment of multi-decadal global land surface temperature trends" (2007)

2007 – A new US temperature version, USHCNv2 made significant changes including the removal of urban warming adjustments,

algorithms to detect station moves and 'homogenization'. David Easterling, Chief Scientific Services Division for NOAA's Climate Center expressed concern in a letter to James Hansen at NASA "One fly in the ointment, we have a new adjustment scheme for USHCNv2 that appears to adjust out some, if not all of the local trend that includes land use change and urban warming".

2008 - In a volunteer national survey project, Anthony Watts and his more than 650 volunteers at www.surfacestations.org found that over 900 of the first 1,067 stations surveyed in the 1,221 station U.S. climate network did not come close to the specifications as employed in Climate Reference Network (CRN) criteria.

Only about 3% met the ideal specification for siting. They found stations located next to the exhaust fans of air conditioning units, surrounded by asphalt parking lots and roads, on blistering-hot rooftops, and near sidewalks and buildings that absorb and radiate heat.

They found 68 stations located at wastewater treatment plants, where the process of waste digestion causes temperatures to be higher than in surrounding areas. In fact, they found that 90% of the stations fail to meet the National Weather Service's own siting requirements that stations must be 30 m (about 100 feet) or more away from an artificial heating or reflecting source.

2009 - NASA's Dr. Edward R. Long in a [2009 analysis](#) looked at the new version of the US data. Both raw and adjusted data from the NCDC (now NCEI) has been examined for a selected Contiguous U.S. set of rural and urban stations, 48 each or one per State. The raw data provides 0.13 and 0.79 C/century temperature increase for the rural and urban environments, consistent with urban factors. The adjusted data show increases of 0.64 and 0.77 C/century respectively.

Comparison of the adjusted data for the rural set to that of the raw data shows a systematic treatment that causes the rural adjusted set's temperature rate of increase to be 5-fold more than that of the raw data. This suggests the consequence of the NCDC's protocol for adjusting the data is to cause historical data to take on the time-line characteristics of urban data. The consequence

intended or not, is to report a false rate of temperature increase for the Contiguous U. S., consistent with current climate model forecasts.

2009 – Scientists in Australia and New Zealand began questioning the climate data, which had changed with the homogenization seen with GHCN. In Australia, in many cases, temperature trends had changed from slight cooling to dramatic warming over 100 years. This included Darwin where before getting homogenized, temperatures in Darwin were falling at 0.7 Celsius per century...but after the homogenization, they were warming at 1.2 Celsius per century and Amberley, where a cooling of 1C per century became a warming of 2.5C. The New Zealand Climate Science Coalition found adjustments that were similarly inexplicable (0.006 degrees C per century was adjusted up to 0.9 degrees C/Century). The National Institute for Water and Atmospheric Research (NIWA) was forced to disavow it's own National Temperature Records, and belatedly pretend that it had never been intended for public consumption.

2010 – A 2009 review of temperature issues was published by a large group of climate scientists entitled [Surface Temperature Records: A Policy Driven Deception](#)

2010 - A landmark [study](#), *Analysis of the impacts of station exposure on the U.S. Historical Climatology Network temperatures and temperature trends*, followed, authored by Souleymane Fall, Anthony Watts, John Nielsen-Gammon, Evan Jones, Dev Niyogi, John R. Christy, Roger A. Pielke Sr represented years of work in studying the quality of the temperature measurement system of the United States.

2010 - In a review sparked by this finding, the GAO found “42% of the active USHCN stations in 2010 clearly did not meet NOAA’s siting standards. Whatsmore, just 24 of the 1,218 stations (about 2 percent) have complete data from the time they were established.”

2011 – A paper “[A Critical Look at Surface Temperature Records](#)” was published in Elsevier’s “Evidence-Based Climate Science.

2013 – NOAA responded to papers on siting and GAO admonition by removing and/or replacing the worst stations. Also in monthly press

releases no satellite measurements are ever mentioned, although NOAA claimed that was the future of observations.

2013 – Richard Muller releases The Berkeley Earth Surface Temperatures (BEST) set of data products, originally a gridded reconstruction of land surface air temperature records spanning 1701-present, and including an 1850-present merged land-ocean data set that combines the land analysis with an interpolated version of HadSST3. The fact that homogenization is heavily used and there are seasonal biases prior to Stevenson Screens (which shaded the instrument from the sun but allowed ventilation) in the early record are noted.

2015 – A pause in warming that started around 1997 was finally acknowledged in [a paper](#) in the journal Nature by IPCC scientists and attributed to cyclical influences of natural factors like El Nino, ocean cycles on global climate. The AMS Annual Meeting in 2015 had 3 panels to address ‘the pause’.

2016 – The study of Tom Karl et al. 2015 purporting to show no ‘hiatus’ in global warming in the 2000s ([Federal scientists say there never was any global warming “pause”](#)). John Bates who spent the last 14 years of his career at NOAA’s National Climatic Data Center as a Principal Scientist commented “in every aspect of the preparation and release of the datasets leading into Karl 2015, we find Tom Karl’s thumb on the scale pushing for, and often insisting on, decisions that maximize warming and minimize documentation.” The study drew criticism from other climate scientists, who disagreed with Karl’s conclusion about the ‘hiatus.’

2017 – A new U.S. climate data set called nClimDiv with climate division model reconstructions and statewide averages was gradually deployed and replaced USHCNv2. The result was NOAA gave 40 out of 48 states ‘new’ warming. The Drd964x decadal CONUS warming rate from 1895 to 2012 was 0.088F/decade. The new nClimDiv rate from 1895 to 2014 is 0.135F/decade, almost double. Though it makes the job of analysts and data access more flexible, it was at the expense of accuracy as demanded by the IQA.

2017 – Landmark studies were published which proved conclusively that the steadily rising Atmospheric CO₂ Concentrations had [no statistically](#)

[significant impact](#) on any of the 14 temperature time series (at the surface and in the atmosphere) and showed the so called greenhouse induced [Tropical Hot Spot](#) caused by rising atmospheric CO₂ levels, simply does not exist in the real world.

2019 - Climate Scientist Dr. Mototaka Nakamura in his book *“Confessions of a climate scientist: the global warming hypothesis is an unproven hypothesis”* writes that over the last 100 years “only 5 percent of the Earth’s area is able show the mean surface temperature with any certain degree of confidence. “A far more serious issue with calculating ‘the global mean surface temperature trend is the acute spatial bias in the observation stations. There is nothing they can do about this either. No matter what they do with the simulation models and data assimilation programs, this spatial bias before 1980 cannot be dealt with in any meaningful way.” *“So how can we be sure about the globe’s temperatures, and thus it’s trends before 1980? You can’t. The real data just aren’t there. Therefore, the global surface mean temperature change data no longer have any scientific value and are nothing except a **propaganda tool** to the public.”*

2020 - The U.S. Regional Climate Reference Network (USRCRN) pilot program (2011) had goals to maintain the same level of climate science quality measurements as the national-scale U.S. Climate Reference Network (USCRN), but its stations would be spaced more closely and focus solely on temperature and precipitation. After a pilot project in the Southwest, USRCRN stations were to be deployed at a 130 km spatial resolution across the United States to provide for the detection of regional climate change signals. If NOAA had advanced this, America would for the first time ever have a data set that could be relied on for policy making after a few decades. Even then, the new data will not replace the old data with all its issues and uncertainties, which are not appropriate for policy decisions. It appears this program will not be advanced under this administration.

2020 - Taishi Sugiyama of Japan’s The Canon Institute for Global Studies working paper on our climate system: [The Earth Climate System as Coupled Nonlinear Oscillators under Quasi-Periodical Forcing from the Space](#) (this includes ENSO and solar). We could not agree more. See peer-reviewed analyses on these natural factors [here](#).

See this meteorological overview of the natural ocean and solar drivers [here](#).