Waterloo Technical Society Minutes

March 12, 2014 Meeting

The March 12, 2014 WTS meeting was called to order by President Gary Dorhout at 7:00 pm.

A total of 38 were in attendance which includes 8 guests. Treasurer Ken Friend reported a previous balance of $930.73 with income of $0.11 from interest and expense of two speaker meals totaling $30.00 leaving a new balance of $900.84. Membership remains at 10 honorary plus 49 regular members for a total of 59 members. Ken continues his remarkable job of keeping our money and records straight.

No old business was discussed. No new business was introduced.

Our guest speaker was Ken Friend, with factual verification by Craig Johnson formerly a KWWL meteorologist and currently the State of Iowa Science Director located on the UNI Campus. Ken's topic was 100 years of Weather History.

Introduction. Ken began his presentation with a brief introduction of the topic and noted that he relied heavily on the National Oceanic and Atmospheric Administration (NOAA) weather data bases, especially the National Climatic Data Center (NCDC) located in Asheville, NC for his information. In particular www.NOAA.gov and www.NCDC.NOAA.gov were two sites where he was able to perform data searches. The NCDC data indicate that temperatures are approximately 5^{o} Fahrenheit (F) higher in the last 22 years.

Measurement of temperature has evolved since 1610 when the first thermometer was invented. There are approximately 11,000 measurement stations in the USA with 1,200 being considered representative of the true temperature (11%). Twenty-three sites have data back to approximately 1890. NCDC sites have values that have drifted upward since 1960, accounting for a 0.6^{o} F. change. A discontinuity in the measurements has been observed when NOAA moved from version 1 to version 2 of the temperature correction algorithm in 2000.

Global Data. Since 1978 when the USA began putting weather satellites in space, we have been able to look at global temperatures. Today there are 5 weather satellites circling the globe. The temperature measurements are made using microwave technology (RADAR) enabling recording of temperatures on the earth's surface as well as at any altitude. These locations also include the North and South Poles. Dr. James E. Hansen, NASA/GISS (NASA Goddard Institute for Space Studies), sounds the alarm for global warming finding from 1994 to 2000 a 0.7^{o} F. rise in the global surface recordings. These have been level since 2001. Tropospheric and lower stratospheric temperature data are collected by NOAA's TIROS-N polar-orbiting satellites and adjusted for time-dependent biases by the Global Hydrology and Climate Center at the University of Alabama in Huntsville (UAH). An independent analysis is also performed by Remote Sensing Systems (RSS) and a third analysis has been performed by Dr. Qiang Fu of the University of Washington. The RSS analysis agrees with the NASA analysis.

Severe Weather. Another factor in the weather change debate is the occurrence of severe weather events. Examination of the number of hurricanes that made landfall show no pattern. Accumulated Cyclonic Energy (ACE) from satellites show no increase and actually a decrease in the Pacific arena. Tornados show no increase, even severe ones that make headlines.

Global Sea Ice. The amount of global sea ice actually grew in 2013. The amount varies with the lowest amount in recent years occurring in 2005. NASA earth observations since 1978 show Antarctic sea ice has increased 1.1% per decade with 2013 setting a record. The Snow and Ice Center in Boulder, CO shows growth in Antarctic sea ice as well. The UAH analysis shows increases in ice and a study at Rutgers University shows increases in snow.

Temperature. The average earth surface temperature is close to $+59^{o}$ F. Without carbon dioxide (CO_2) the temperature is estimated to fall to -105^{o} F. The earth needs to radiate heat from the sun to reach equilibrium. The sun's short wave radiation is somewhat absorbed by the earth and the rest reflected. Ultraviolet A (UVA) radiation creates ozone which floats on the tropopause and protects the earth. Water vapor has absorption bands that heat the earth. Some long wavelength radiation by the earth escapes, but a lot is trapped in the atmosphere by this vapor. So these factors help keep the earth warm. Carbon dioxide has a narrow absorption band around 16 μM. Water vapor has a broader range of absorption. It is water vapor that dominates greenhouse gases, not CO_2. The earth makes its own atmosphere. Clouds of water vapor act as a feedback control. An increase in latent heating warms the sky which in turn radiates more outgoing long wavelength energy to cool.

Models. In order to explain and assist weather prediction, mathematical models of the earth's climate have been created. These models are limited to equations and parameters within the equations for their accuracy. These work well when the relationships and magnitudes of the relationships are well-understood but fail to be good predictors of chaotic systems like the atmosphere. Curve fitting has limitations due to the complications of the earth's physics (currents, topography, weather patterns, etc.). For these reasons the climatic models are not accurate for prediction. However, all 73 of the most popular models show increasing temperature trends. All 73 overestimate the actual values observed.

Conclusion. The temperatures measured over the last 100 years show an increase in earth temperature of approximately 5^{o} F. These records are very unreliable requiring compensation algorithms to keep consistency. A discontinuity in the values occurred when the compensation algorithm was revised in 2000. Approximately 11% of the 11,000 recording stations can be considered representative of the true temperature. Satellite radar since 1978 has enabled a more accurate measurement, especially for the world as a whole. While much concern has been expressed about the carbon dioxide effect on this global warming, a much larger contributor to global warming is water vapor. Satellite data from 1990 to 2001 does show a warming, but this trend has leveled off since and remains steady. Predictive models are too unreliable, are not trustworthy and are driven by carbon dioxide levels rather than water vapor content. The data summarized by Ken are open to interpretation by proponents of global warming as well as those who are skeptical.

Question and Answers. Questions were raised and handled by both Ken and Craig Johnson. The questions were raised by both proponents and skeptics of global warming. Craig emphasized once again that 89% of measuring instruments on the ground in the USA are not sited properly. 100 new posts are now in locations that should remain "rural" for the foreseeable future. A listener raised the point that ice area may be larger, but the ice mass is actually less. The volume is 20% of the 1971 ice mass measurements. Surface area measurements may be misleading. Craig urged again that people consider water vapor as the climatic driver in their models; not CO_2.

Follow Up. There will be a discussion on *Human & Natural Causes for Climate Change* in June at the Center for Energy & Environmental Education (CEEE) on the UNI campus.

The discussion is open to the public, and is the kick-off event for the *UNI Faculty Leadership in Sustainability Education Summer Institute 2014* with focus on *Climate Variability & Resilience*. CEEE will host The Institute on Thursday-Friday, June 19-20.

The hour-long discussion will begin at 9:00 am on Thursday June 19 in the CEEE Auditorium The session will feature two speakers:

- Steven Goreham, policy adviser to the Heartland Institute and author of the recent book *Welcome to The Mad, Mad, Mad World of Climatism*, will make the case that human intervention is not a significant factor in global warming.
- Jerald Schnoor, Professor of Civil & Environmental Engineering and Co-Director of the Center for Global & Regional Environmental Engineering at the University of Iowa, will make the case for science-based evidence for human intervention in global climate.
- Time will be allotted for Q & A after the presentations.

Meeting adjourned at 8:15 pm.

Respectfully submitted,

Jim Stevenson