Global Warming Data, Trend and Projection
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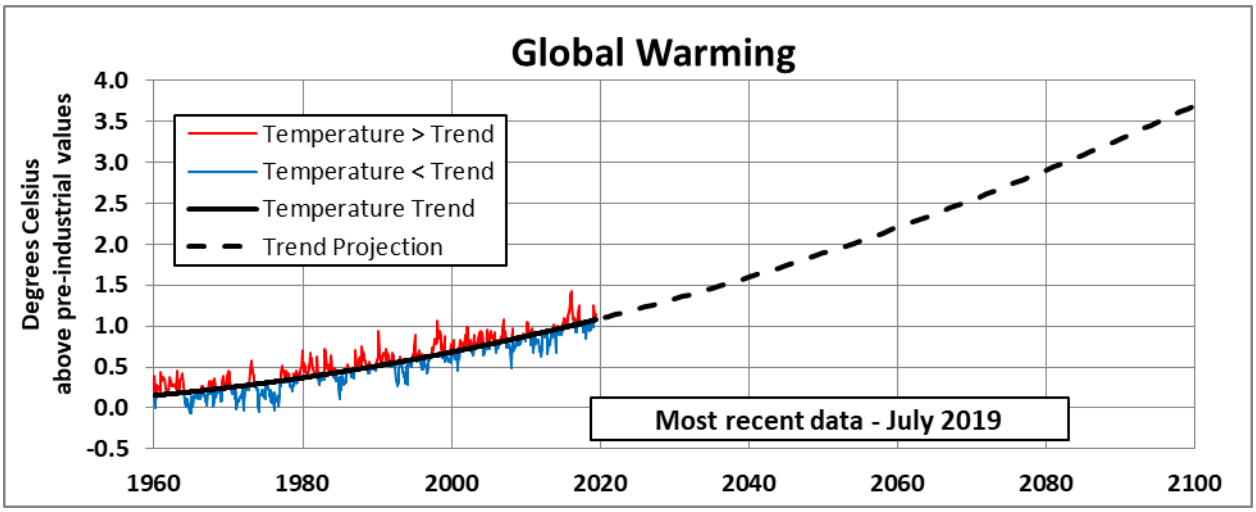

Update Note –
A new monthly record for global surface temperatures!! At 17.0°C above pre-industrial values, July was the warmest month since NOAA began modern records in 1880. Temperature for July 2019 also was higher than the recent trend at 1.15 °C above the pre-industrial July value. El Niño conditions have ended with the El Niño index returning to the neutral range. Solar irradiance is approaching the minimum of its ≈11 year cycle, a cooling effect compared to recent years.

Data – Monthly global surface temperature anomaly data (red and blue lines) are monthly differences from the average temperature *for that month* during the years 1901-2000 and are available from NOAA. Values for February and March, 2016, were higher than the corresponding 20th century averages than was July 2019. But the 20th century average for July is much higher than for February and March, making July 2019 the warmest month of all. The red (blue) lines represent monthly temperatures warmer (cooler) than the trend. Note that **0.2 °C** has been added to the NOAA values to account for the difference between the 20th century average and pre-industrial values.

Trend and Projection — The trend shown in the chart is a quadratic fit to the recorded monthly global temperatures since 1960 relative to pre-industrial values. The projection is the continuation of this curve into future times. Note that the projection will change as the trend changes in response to new data.

Recent temperatures are more than half the 2.0 °C target limit established by the Paris agreement. Based on the current projection, global temperatures will be 1.5 °C above pre-industrial levels in 2036 and the Paris Agreement's +2.0 °C target limit would be surpassed in 2053 (see chart.) The chart illustrates that some monthly temperatures will exceed the optimistic international limit of +1.5 degrees well before the *trend* reaches that level.