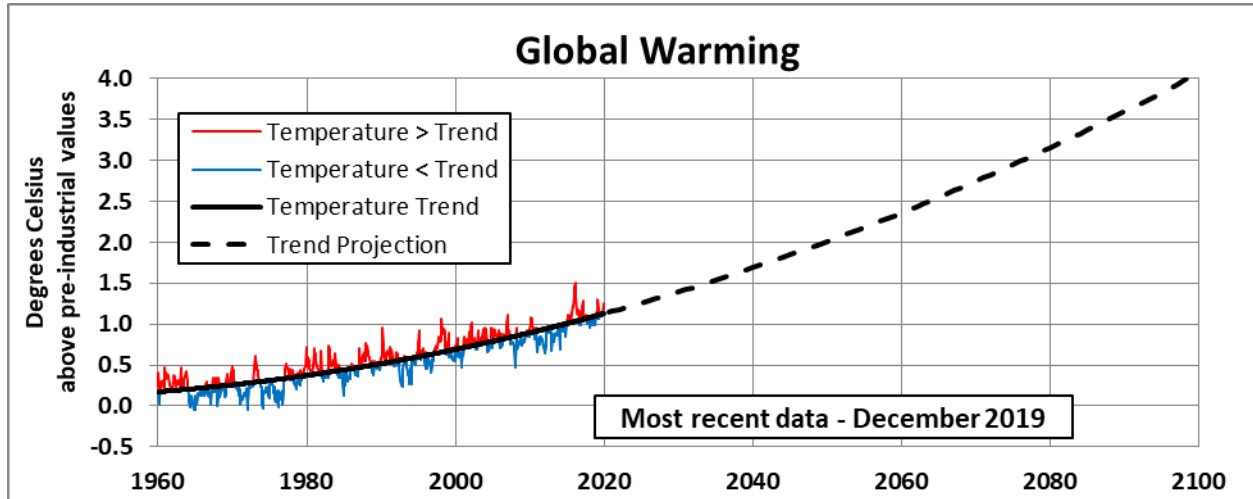# Global Warming Data, Trend and Projection
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Update Note — The global average temperature for December 2019 was 1.25°C above pre-industrial values, second only to December 2015 for the warmest December on record. The global average temperature for the year 2019 was 1.15°C above pre-industrial values, second only to 2016. See comments below.

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. **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. The red (blue) lines represent monthly temperatures warmer (cooler) than the trend.

Temperature Revisions — NOAA revises its monthly temperatures slightly from time to time as more data becomes available or the analysis is improved. As time and energy allow for, we keep our data up to date with the NOAA values. This month's temperatures values are now current, some of which NOAA has revised upward. The trend in the chart is now steeper than in earlier versions, which changes projections.

Trend and Projection — The trend shown in the chart is a quadratic fit to 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 revised projection, global temperatures will be 1.5 °C above pre-industrial levels in 2033 and the Paris Agreement's +2.0 °C target limit would be surpassed in 2049 (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.