A Better Graph

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Sorry to have temporarily stopped writing Communications – was working on a paper that we hope to soon make available. But here is something useful: a better graph.

For decades we have reported/updated the global temperature record, showing the calendar-year annual-mean temperature, usually with the 5-year running-mean included. I submit that the graph below is not only more beautiful, but more informative and it can be usefully updated every month rather than once a year. The 12-month running-mean takes out the seasonal cycle just as well as the calendar-year mean and includes the calendar-year mean (black squares). The 11-year running mean does a pretty good job of taking out solar cycle variability and shorter-term variability such as the Southern Oscillation.

Note that the calendar-year means tend to fall a bit below a preceding maximum in the 12-month running mean, so the 2016 mean will probably fall a bit below the current +1.3°C warming relative to 1880-1920. That small drop is usually related to the phasing of the El Nino cycle relative to the calendar year.

BTW, this graph also switches to 1880-1920 as a base period, because of the widespread interest in the magnitude of warming relative to pre-industrial time. Alternatively, one might argue for an earlier base period, say 1700-1800, but the data are much poorer then and the difference in global mean is only about +0.1°C ± 0.1°C (1880-1920 slightly warmer than 1700-1800), so it is of no practical importance.
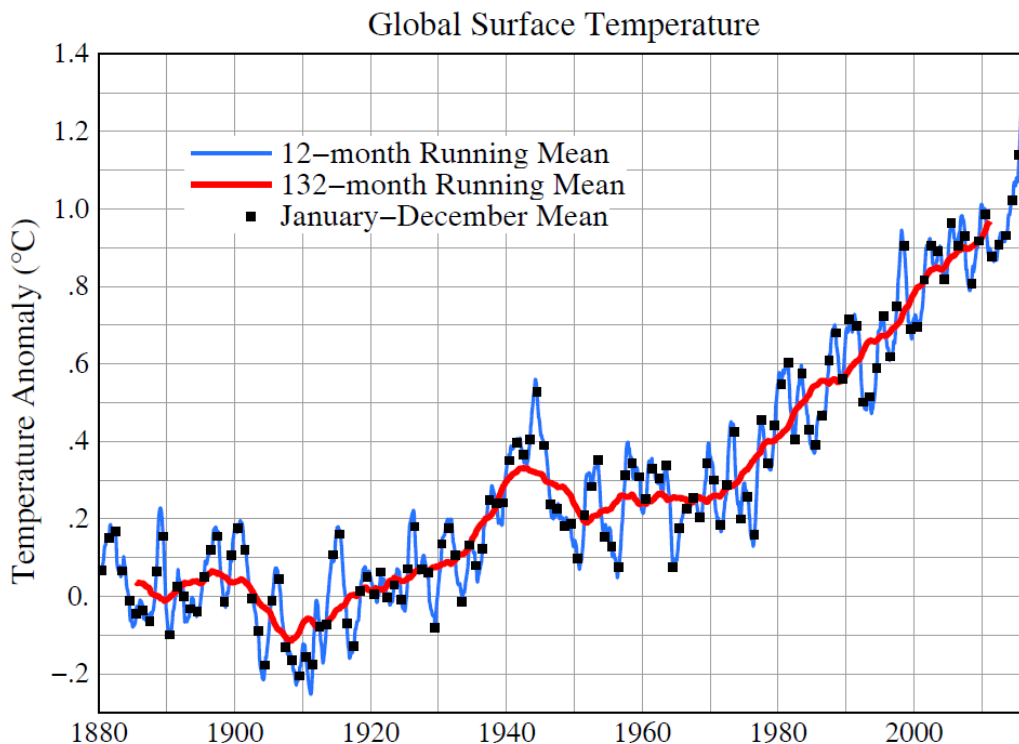

Fig. 1. Global surface temperature relative to 1880-1920 based on GISTEMP analysis (mostly NOAA data sources, as described by Hansen, J., R. Ruedy, M. Sato, and K. Lo, 2010: Global surface temperature change. *Rev. Geophys.*, **48**, RG4004. We suggest in an upcoming paper that the temperature in 1940-45 is exaggerated because of data inhomogeneity in WW II. Linear-fit to temperature since 1970 yields present temperature of 1.06°C, which is perhaps our best estimate of warming since the preindustrial period.