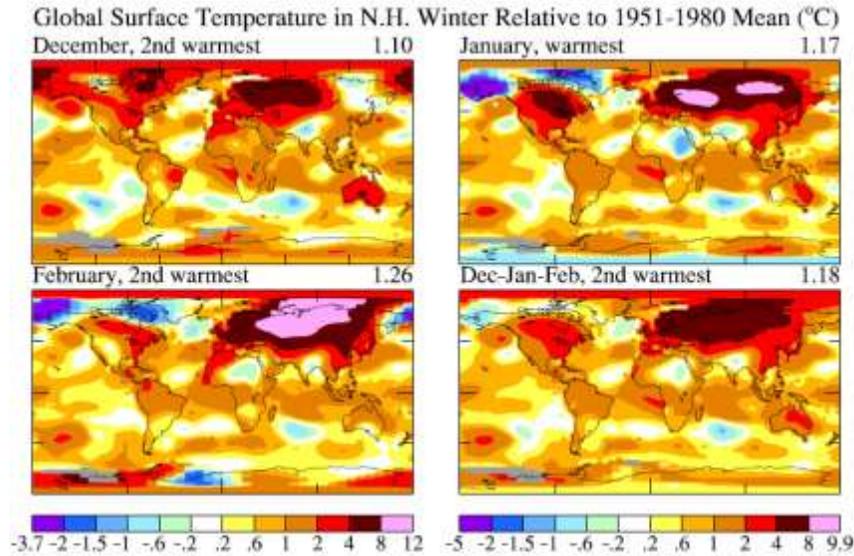


February 2020 Global Temperature Update



February 2020, on global average, was the second warmest February since the reliable measurements began in 1880, at 1.26°C relative to the 1951-1980 base period (1.54°C relative to 1880-1920). The Northern Hemisphere winter (Dec-Jan-Feb) was also the second warmest at 1.18°C relative to the 1951-1980 base period (1.47°C relative to 1880-1920).

Most of Eurasia was unusually warm, with parts of Siberia being 10°C or more warmer than the 1951-1980 mean in February. However, Alaska and the Arctic region north of Canada were unusually cold.

The Southern Ocean has cooled over the past half century (map on lower right). This cooling is a result of growing melt of Antarctic ice shelves (freshwater reduces the density of ocean surface water), which has caused the Southern Ocean Meridional Overturning Circulation (SMOC) to slow down (Hansen, J., M. Sato, P. Hearty, R. Ruedy, M. Kelley, V. Masson-Delmotte, G. Russell, G. Tselioudis, J. Cao, E. Rignot, I. Velicogna, B. Tormey, B. Donovan, E. Kandiano, K. von Schuckmann, P. Kharecha, A.N. Legrande, M. Bauer, and K.-W. Lo, 2016: [Ice melt, sea level rise and superstorms: evidence from paleoclimate data, climate modeling, and modern observations that 2 C global warming could be dangerous](#) *Atmos. Chem. Phys.*, **16**, 3761-3812). It is predicted in that paper that SMOC will shut down entirely by mid-century, if greenhouse gases continue to increase rapidly. SMOC shutdown closes the escape valve for deep Southern Ocean heat; resulting deep ocean warming is largest at the foot of the ice shelves. The ice shelf foot provides most of the restraining force that ice shelves exert on landward ice, so there is danger of a strong feedback and rapid sea level rise, if global warming continues to increase.

