Climate4you update September 2009

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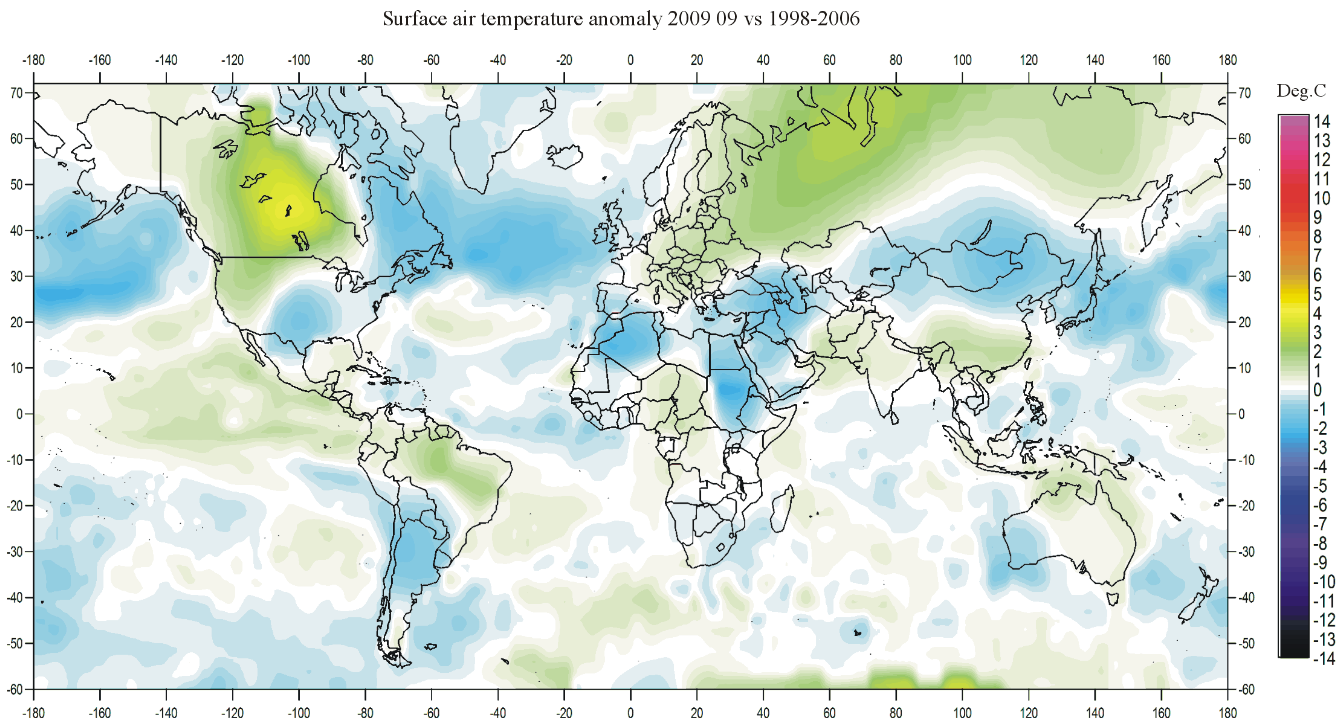
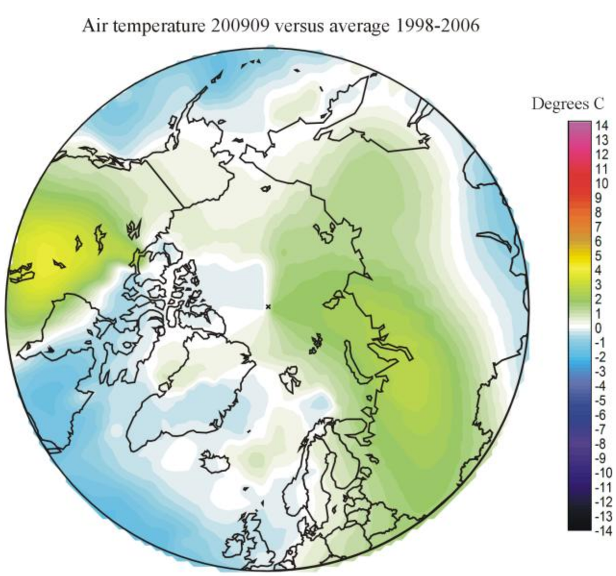
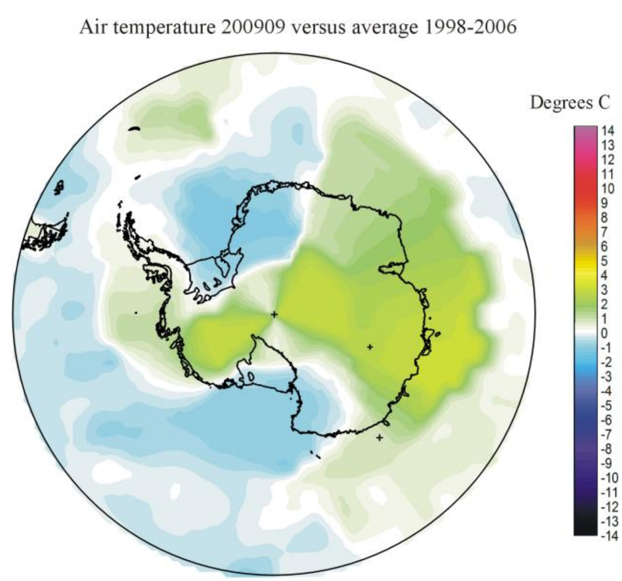
September 2009 global surface air temperature overview

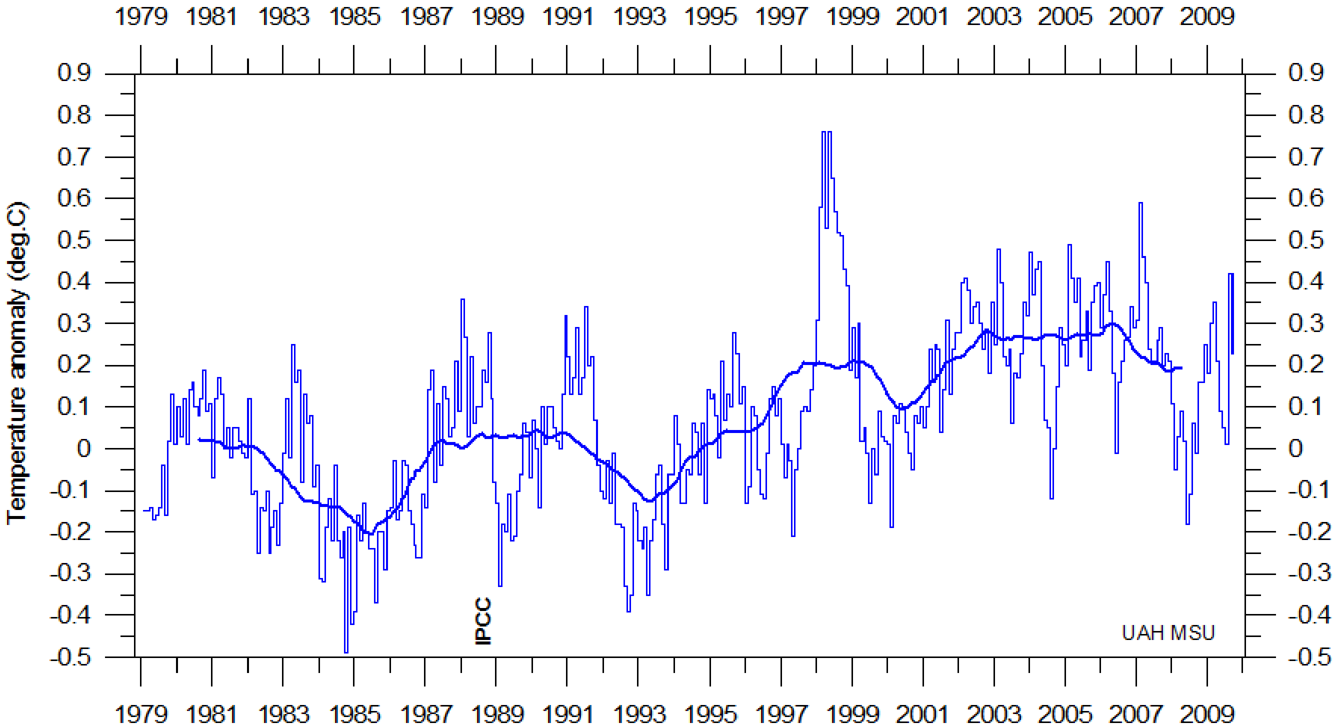




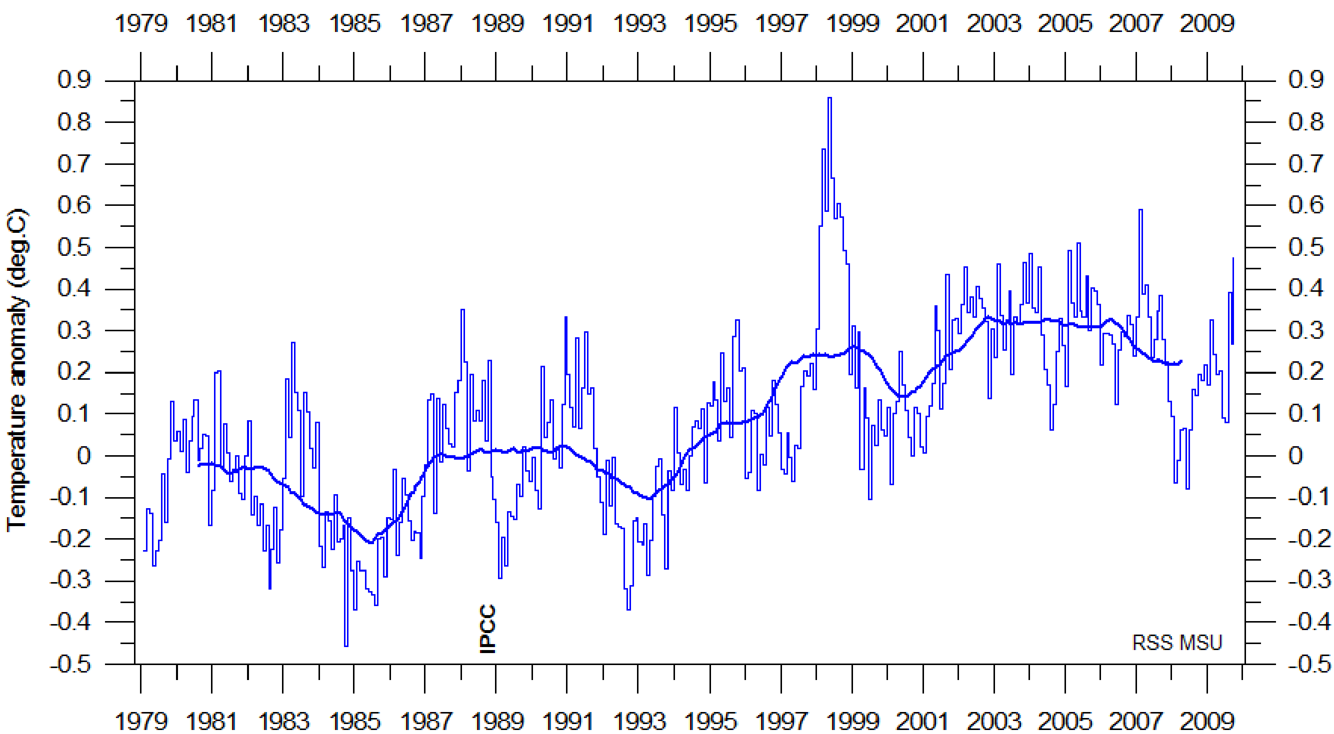


September 2009 surface air temperature compared to the average for September 1998-2006. Green.yellow-red colours indicate areas with higher temperature than the 1998-2006 average, while blue colours indicate lower than average temperatures. Data source: Goddard Institute for Space Studies (GISS)

[Lower troposphere temperature from satellites, updated to September 2009]

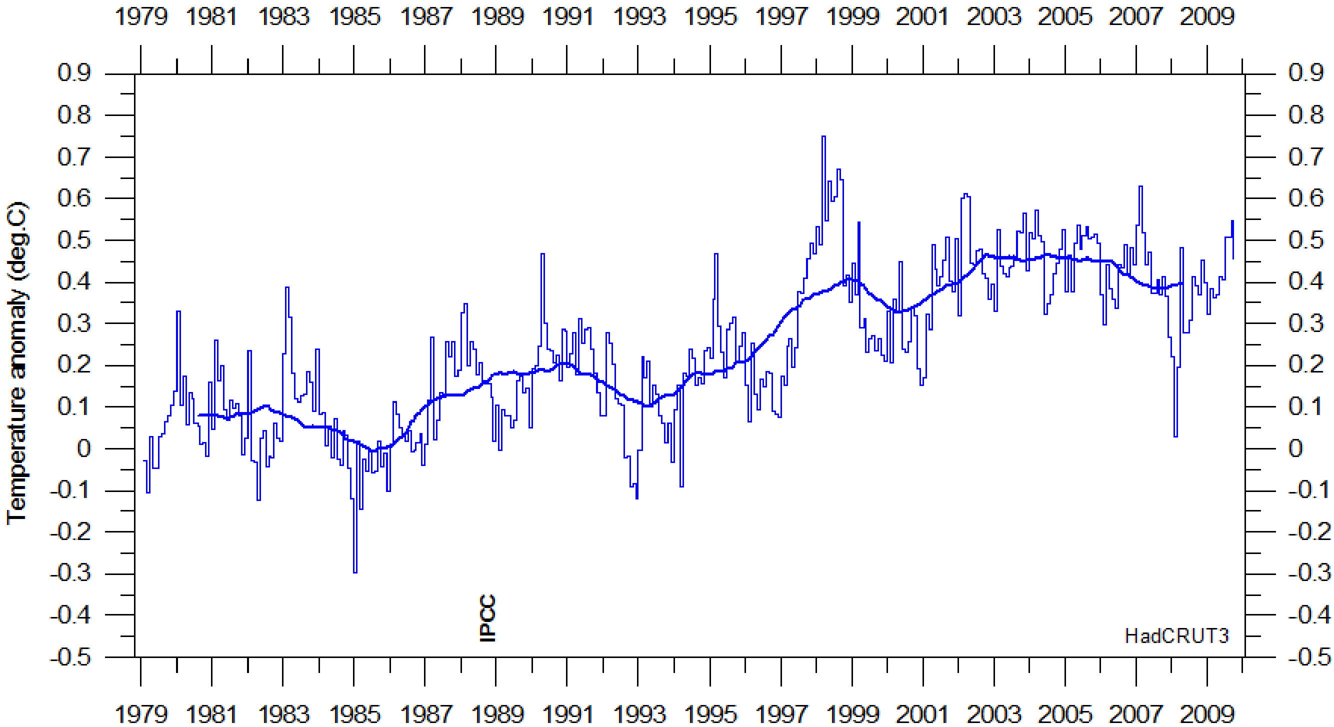


Global monthly average lower troposphere temperature (thin line) since 1979 according to [University of Alabama] at Huntsville, USA. The thick line is the simple running 37 month average.

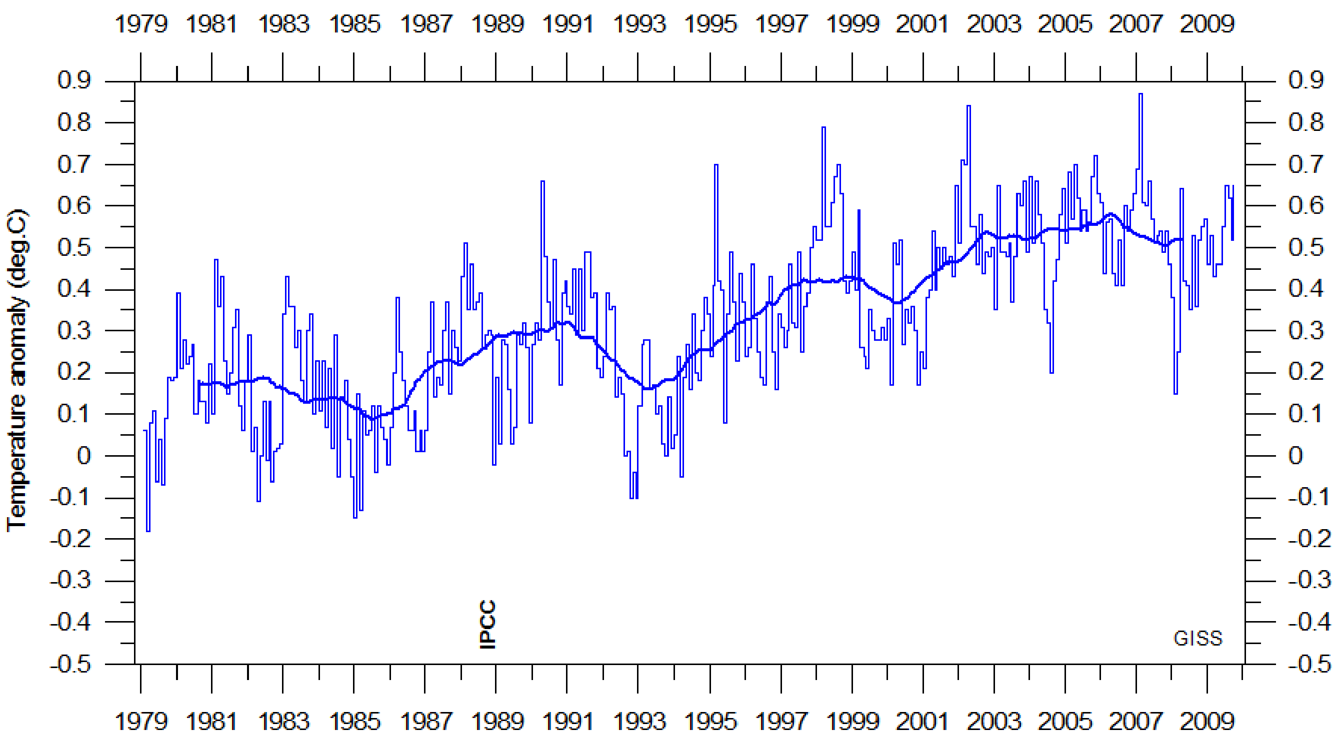


Global monthly average lower troposphere temperature (thin line) since 1979 according to according to [Remote Sensing Systems] (RSS), USA. The thick line is the simple running 37 month average.

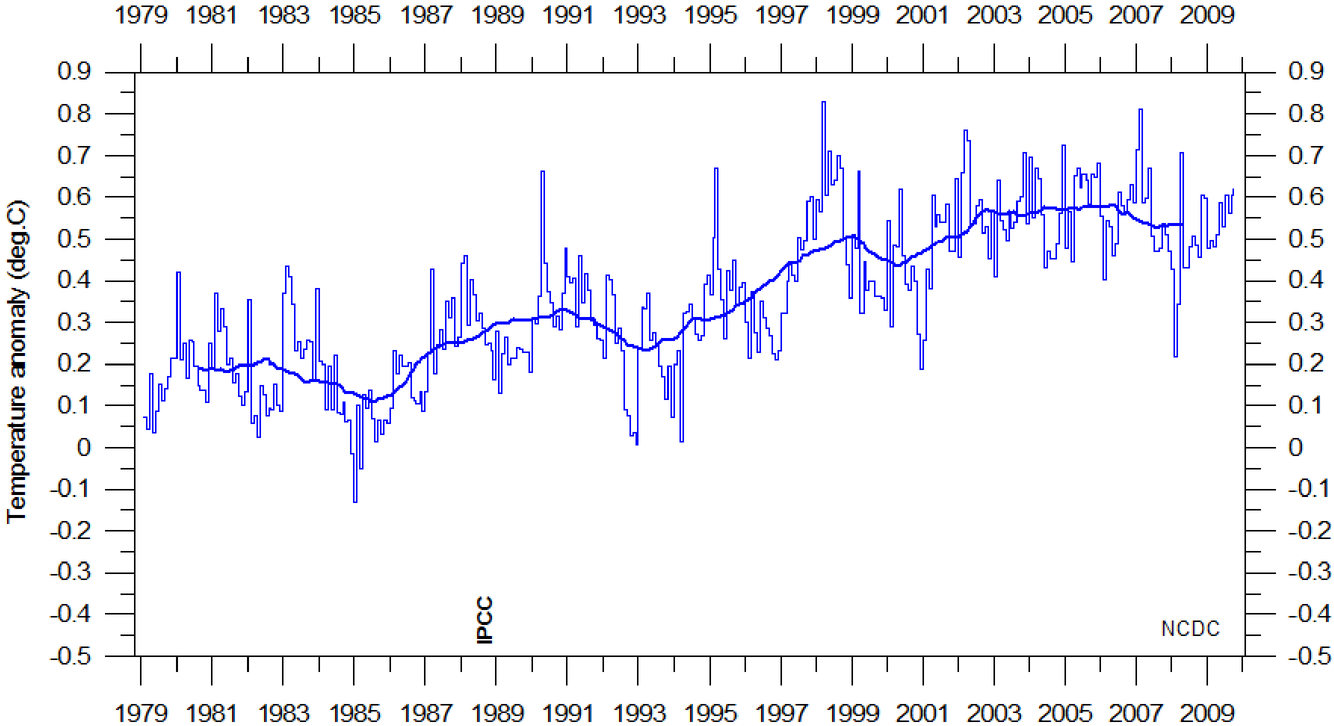
Global surface air temperature, updated to September 2009



Global monthly average surface air temperature (thin line) since 1979 according to according to the Hadley Centre for Climate Prediction and Research and the University of East Anglia's [Climatic Research Unit](#) ([CRU](#)), UK. The thick line is the simple running 37 month average.

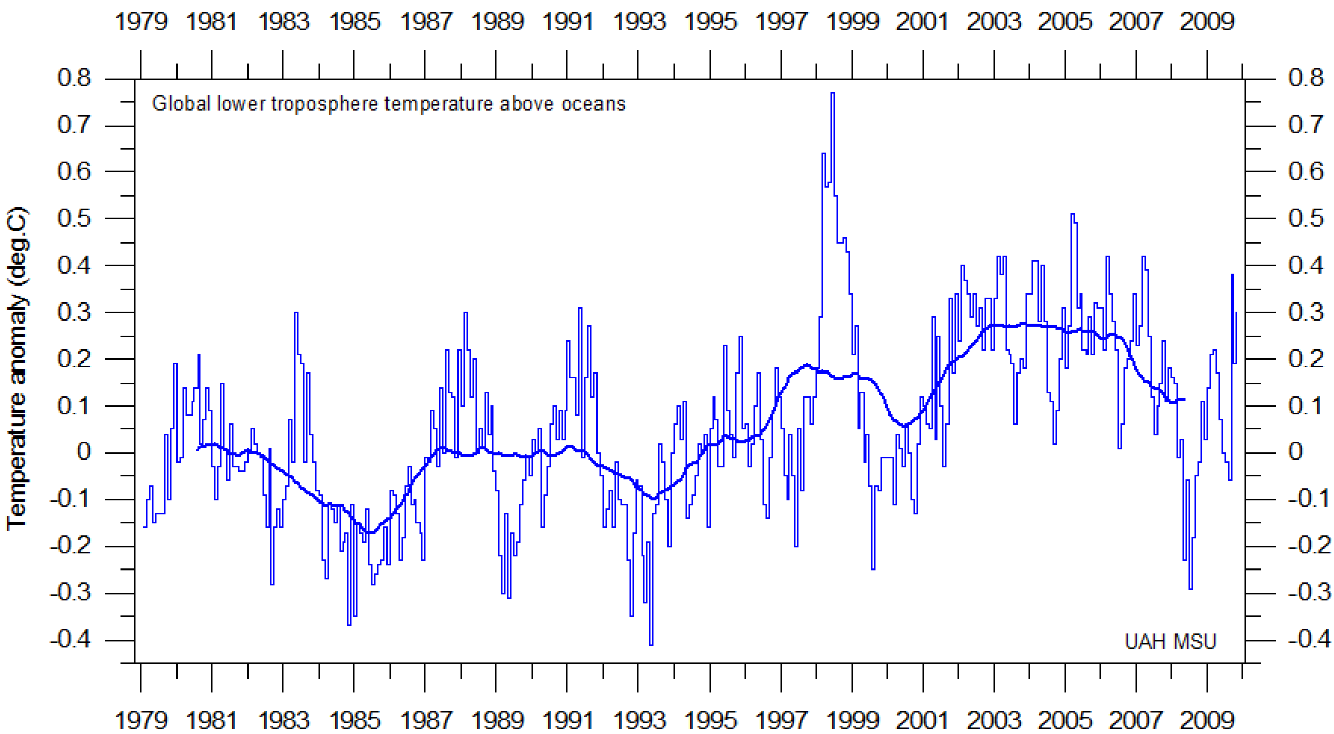


Global monthly average surface air temperature (thin line) since 1979 according to according to the [Goddard Institute for Space Studies](#) (GISS), at Columbia University, New York City, USA. The thick line is the simple running 37 month average.

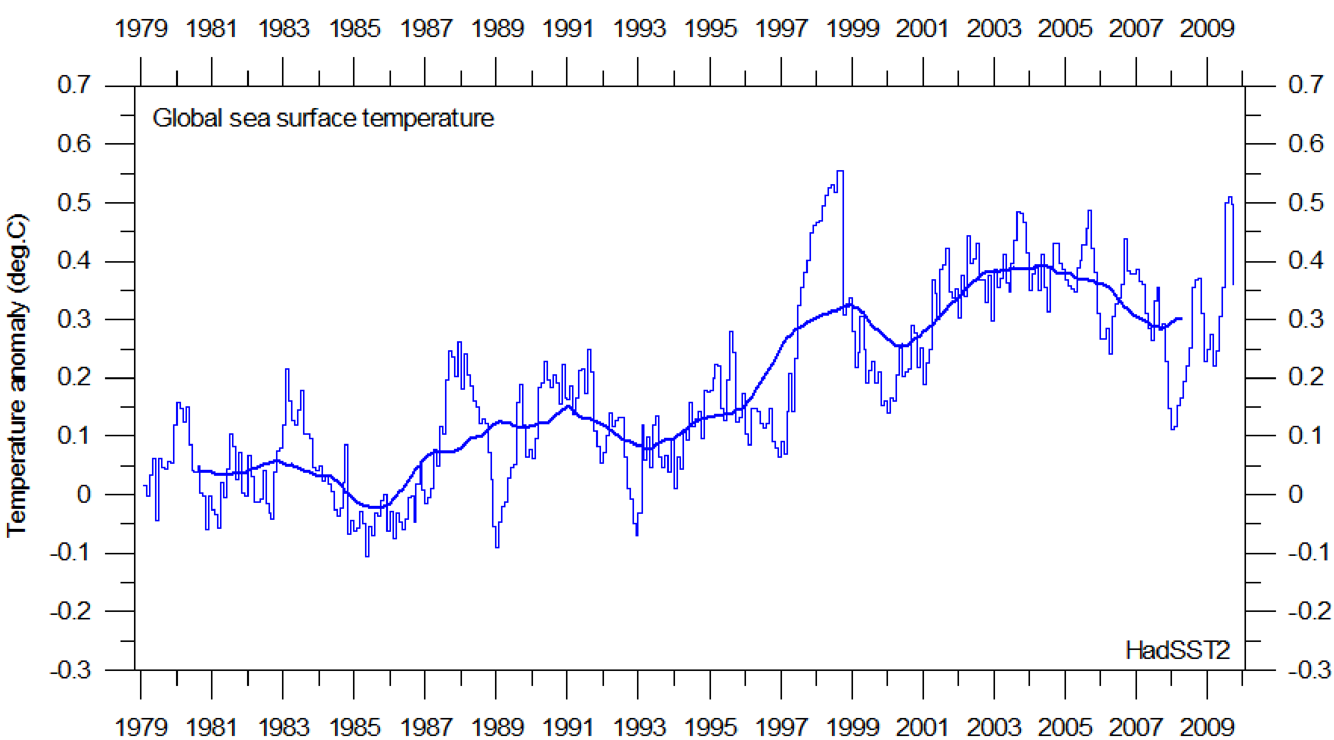


Global monthly average surface air temperature since 1979 according to according to the National Climatic Data Center (NCDC), USA. The thick line is the simple running 37 month average.

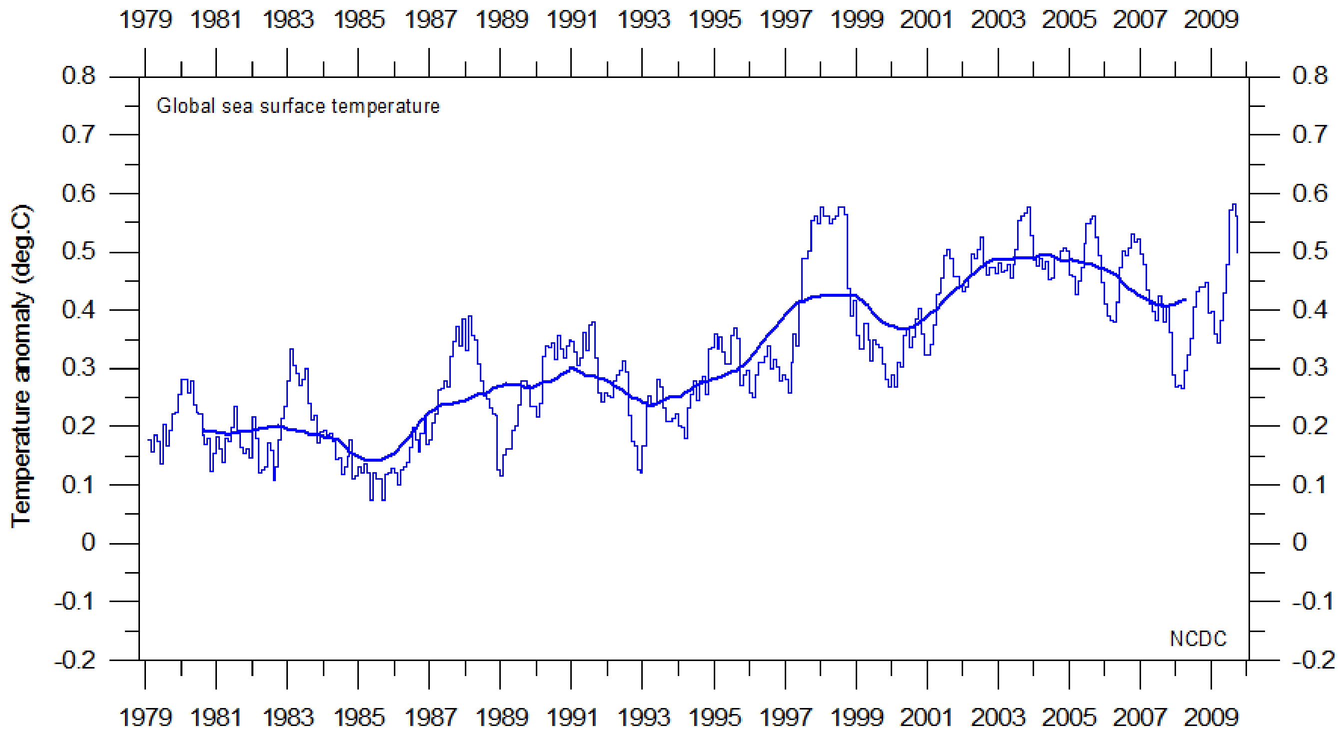
Global sea surface temperature, updated to September 2009



Global monthly average lower troposphere temperature over oceans (thin line) since 1979 according to University of Alabama at Huntsville, USA. The thick line is the simple running 37 month average.

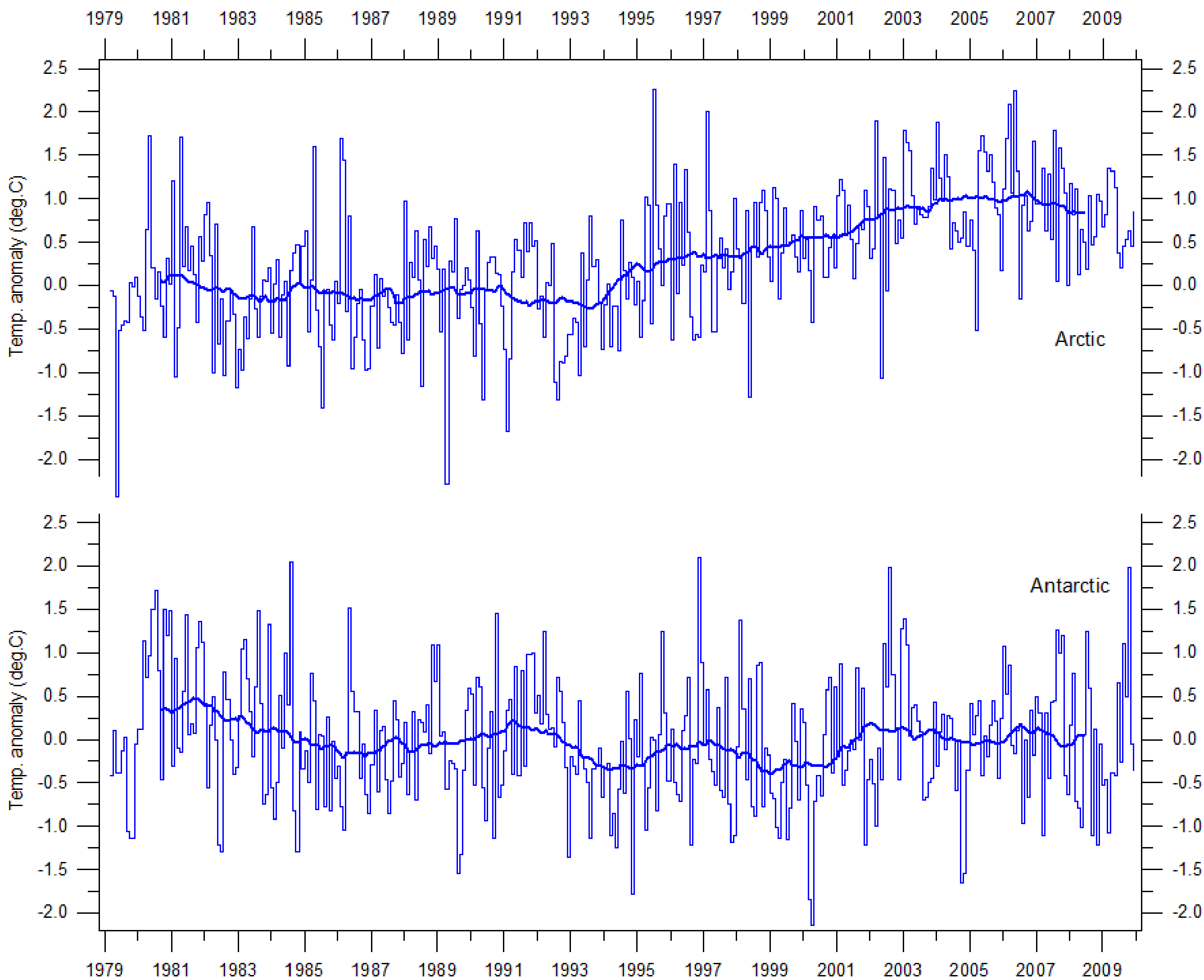


Global monthly average sea surface temperature since 1979 according to University of East Anglia's Climatic Research Unit (CRU), UK. Base period: 1961-1990. The thick line is the simple running 37 month average.



Global monthly average sea surface temperature since 1979 according to the [National Climatic Data Center](#) (NCDC), USA. Base period: 1901-2000. The thick line is the simple running 37 month average.

Arctic and Antarctic lower troposphere temperature, updated to September 2009



Global monthly average lower troposphere temperature since 1979 for the North Pole and South Pole regions, based on satellite observations (University of Alabama at Huntsville, USA). The thick line is the simple running 37 month average, nearly corresponding to a running 3 yr average.

[Arctic and Antarctic surface air temperature, updated to August 2009]()

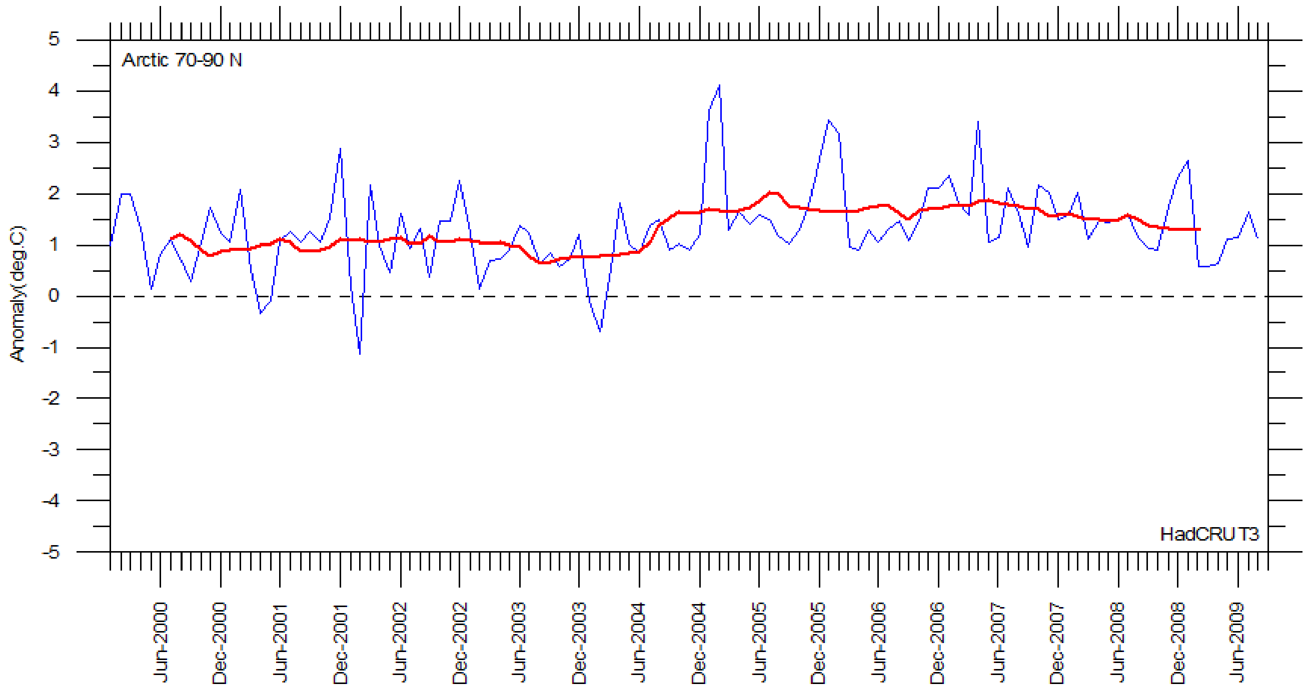


Diagram showing Arctic monthly surface air temperature anomaly 70-90°N since January 2000, in relation to the WMO reference "normal" period 1961-1990. The thin blue line shows the monthly temperature anomaly, while the thicker red line shows the running 13 month average. Data provided by the Hadley Centre for Climate Prediction and Research and the University of East Anglia's [Climatic Research Unit]() ([CRU]()), UK. This data series is only updated to August 2009.

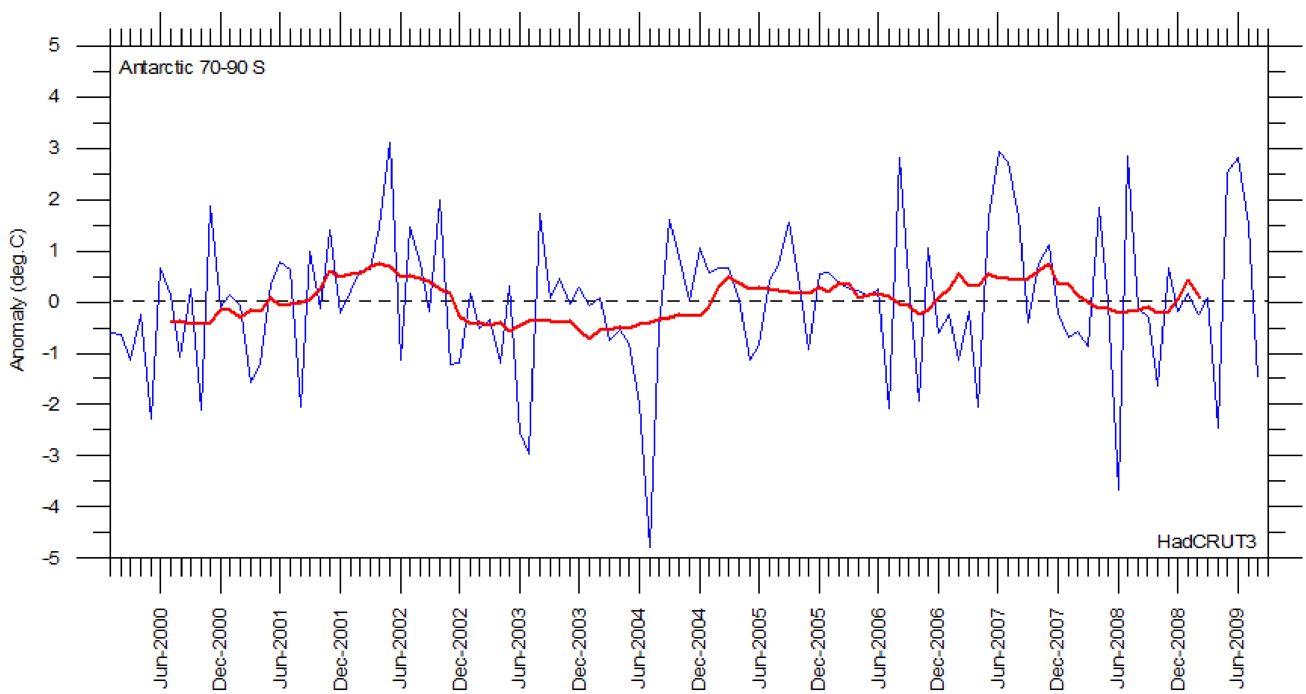


Diagram showing Antarctic monthly surface air temperature anomaly 70-90°S since January 2000, in relation to the WMO reference "normal" period 1961-1990. The thin blue line shows the monthly temperature anomaly, while the thicker red line shows the running 13 month average. Data provided by the Hadley Centre for Climate Prediction and Research and the University of East Anglia's [Climatic Research Unit]() ([CRU]()), UK. This data series is only updated to August 2009.

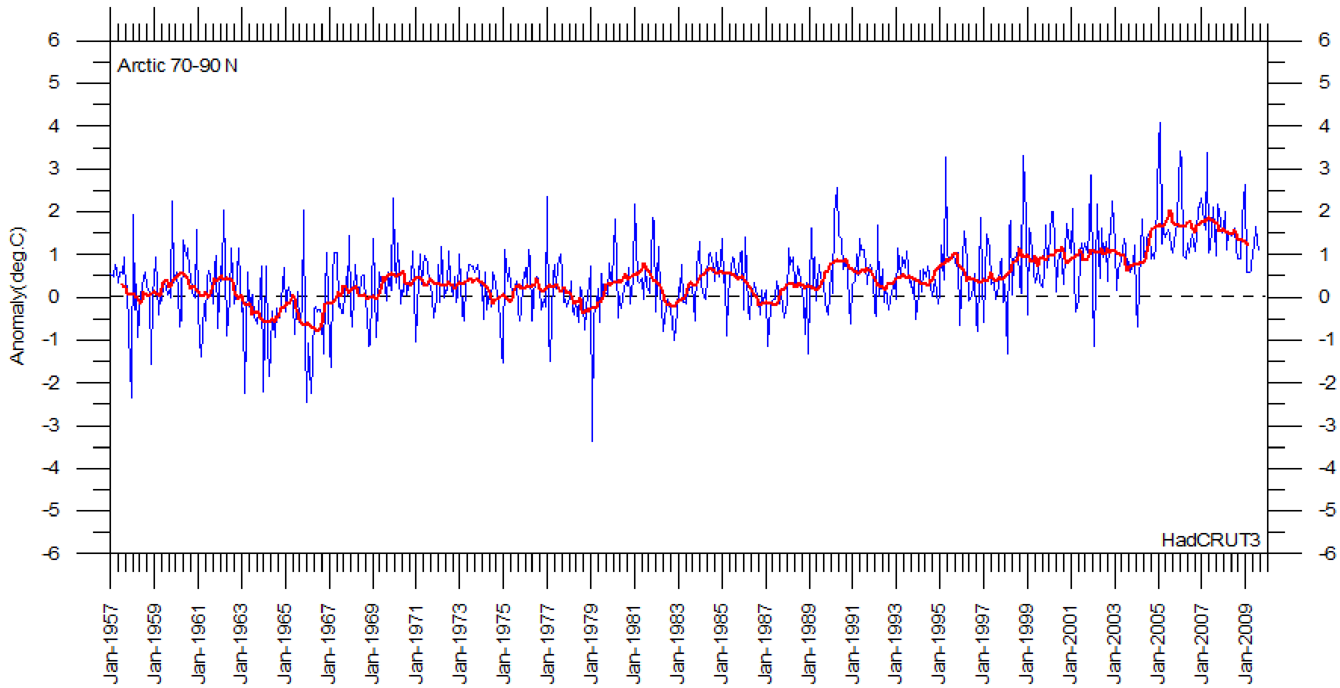


Diagram showing Arctic monthly surface air temperature anomaly 70-90°N since January 1957, in relation to the WMO reference "normal" period 1961-1990. The year 1957 has been chosen as starting year, to ensure easy comparison with the maximum length of the realistic Antarctic temperature record shown below. The thin blue line shows the monthly temperature anomaly, while the thicker red line shows the running 13 month average. Data provided by the Hadley Centre for Climate Prediction and Research and the University of East Anglia's Climatic Research Unit (CRU), UK. This data series is only updated to August 2009.

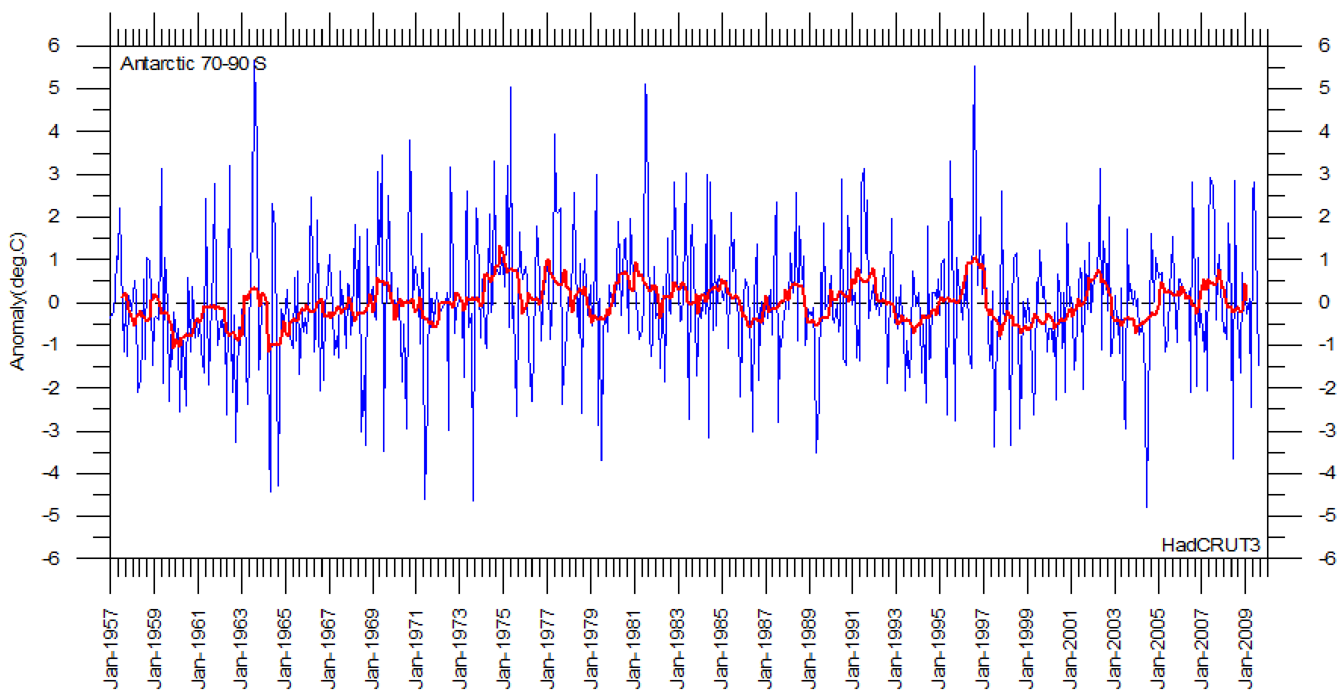


Diagram showing Antarctic monthly surface air temperature anomaly 70-90°S since January 1957, in relation to the WMO reference "normal" period 1961-1990. The year 1957 was an international geophysical year, and several meteorological stations were established in the Antarctic because of this. Before 1957, the meteorological coverage of the Antarctic continent is poor. The thin blue line shows the monthly temperature anomaly, while the thicker red line shows the running 13 month average. Data provided by the Hadley Centre for Climate Prediction and Research and the University of East Anglia's Climatic Research Unit (CRU), UK. This data series is only updated to August 2009.

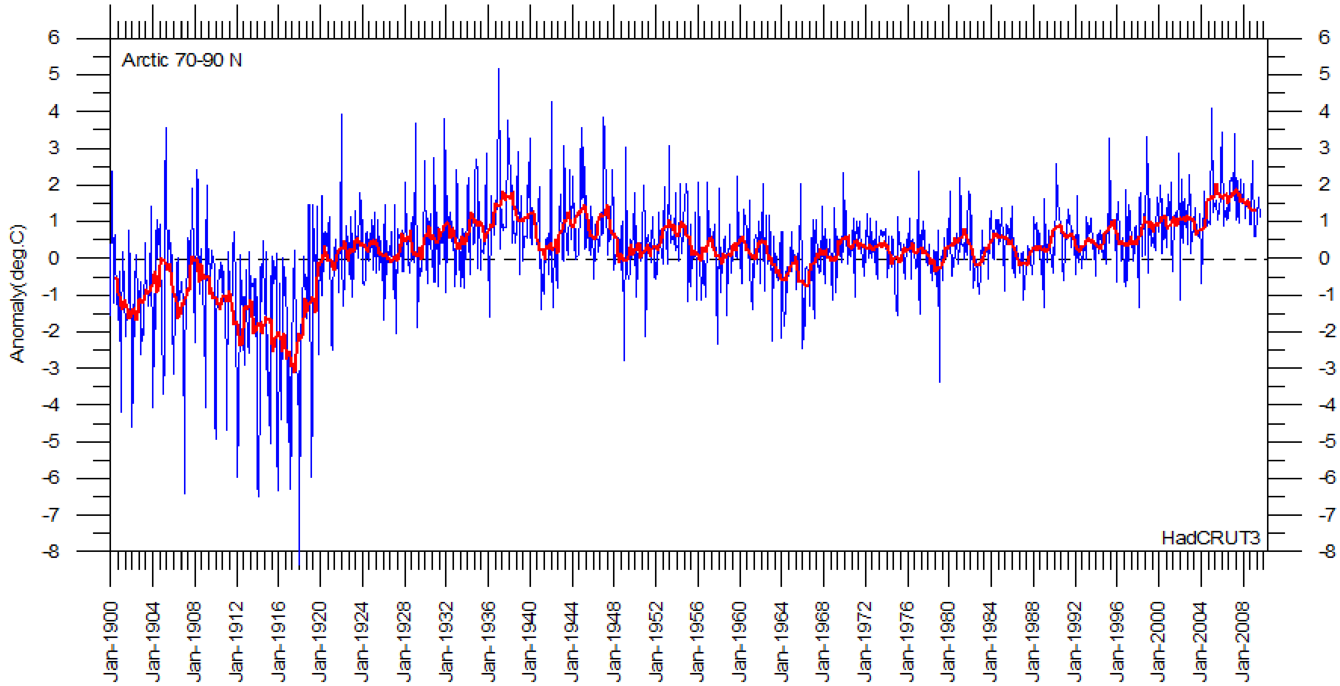
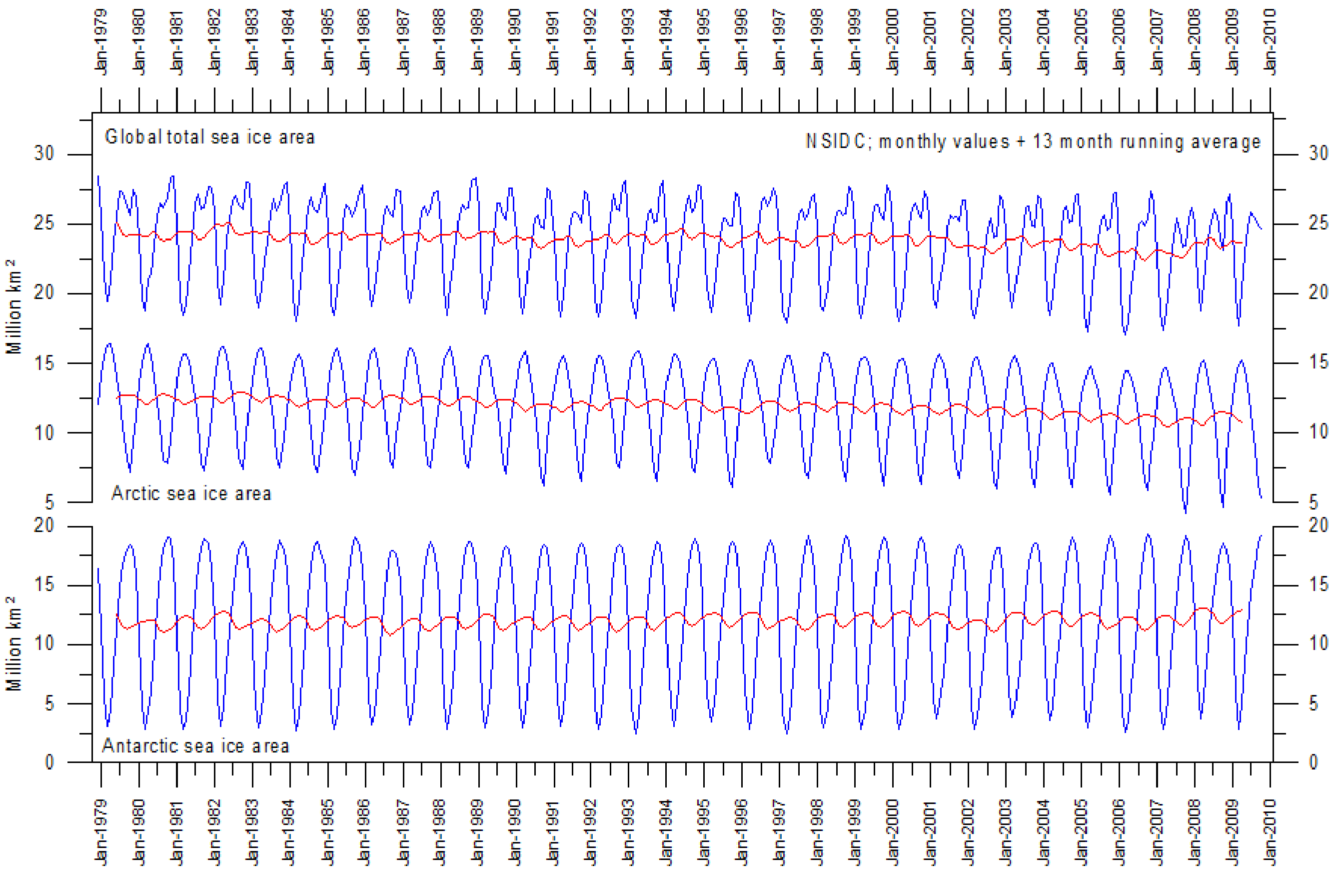


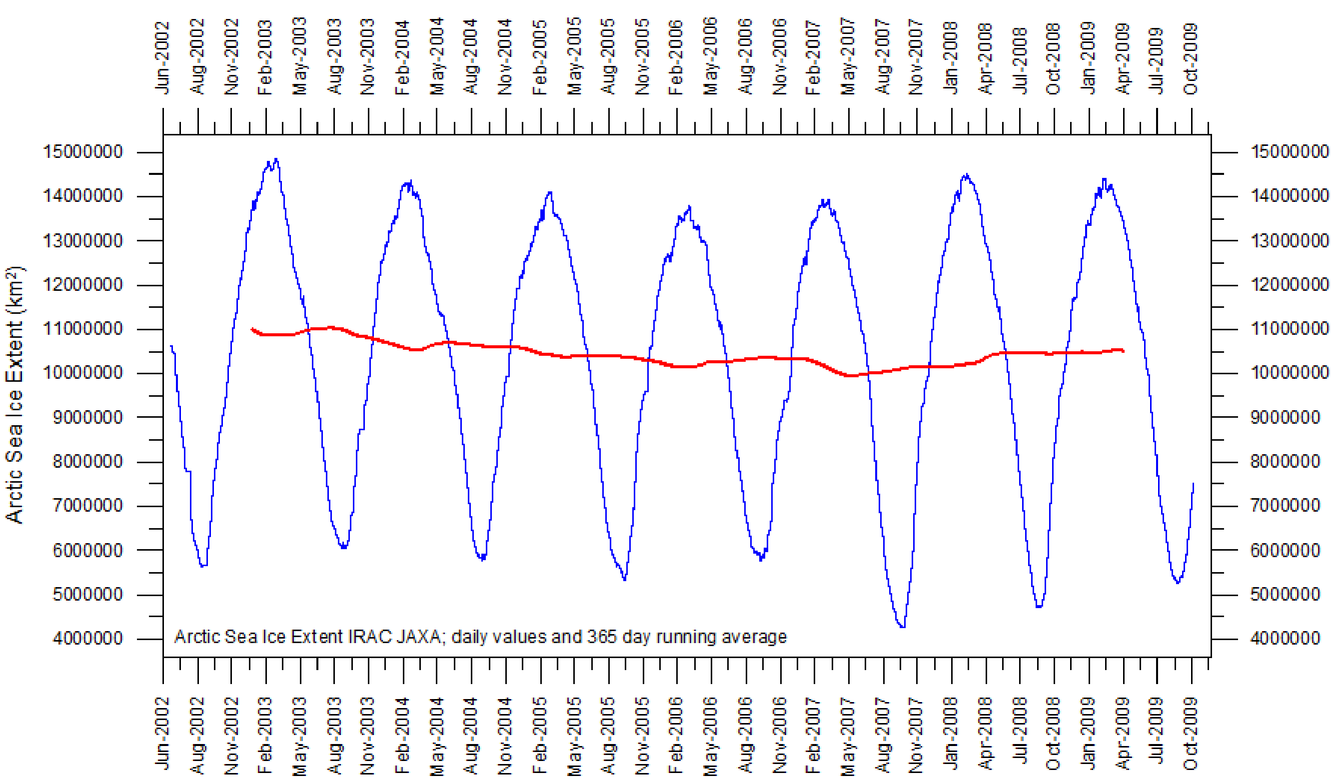
Diagram showing Arctic monthly surface air temperature anomaly 70-90°N since January 1900, in relation to the WMO reference "normal" period 1961-1990. The thin blue line shows the monthly temperature anomaly, while the thicker red line shows the running 13 month average. In general, the range of monthly temperature variations decreases throughout the first 30-50 years of the record, reflecting the increasing number of meteorological stations north of 70°N over time. Especially the period from about 1930 saw the establishment of many new Arctic meteorological stations, first in Russia and Siberia, and following the 2nd World War, also in North America. Because of the relatively small number of stations before 1930, details in the early part of the Arctic temperature record should not be over interpreted. The rapid Arctic warming around 1920 is, however, clearly visible, and is also documented by other sources of information. The period since 2000 is warm, about as warm as the period 1930-1940. Data provided by the Hadley Centre for Climate Prediction and Research and the University of East Anglia's [Climatic Research Unit](#) ([CRU](#)), UK. This data series is only updated to August 2009.

In general, the Arctic temperature record appears to be less variable than the contemporary Antarctic record, presumably at least partly due to the higher number of meteorological stations north of 70°N, compared to the number of stations south of 70°S.

Arctic and Antarctic sea ice, updated to September 2009

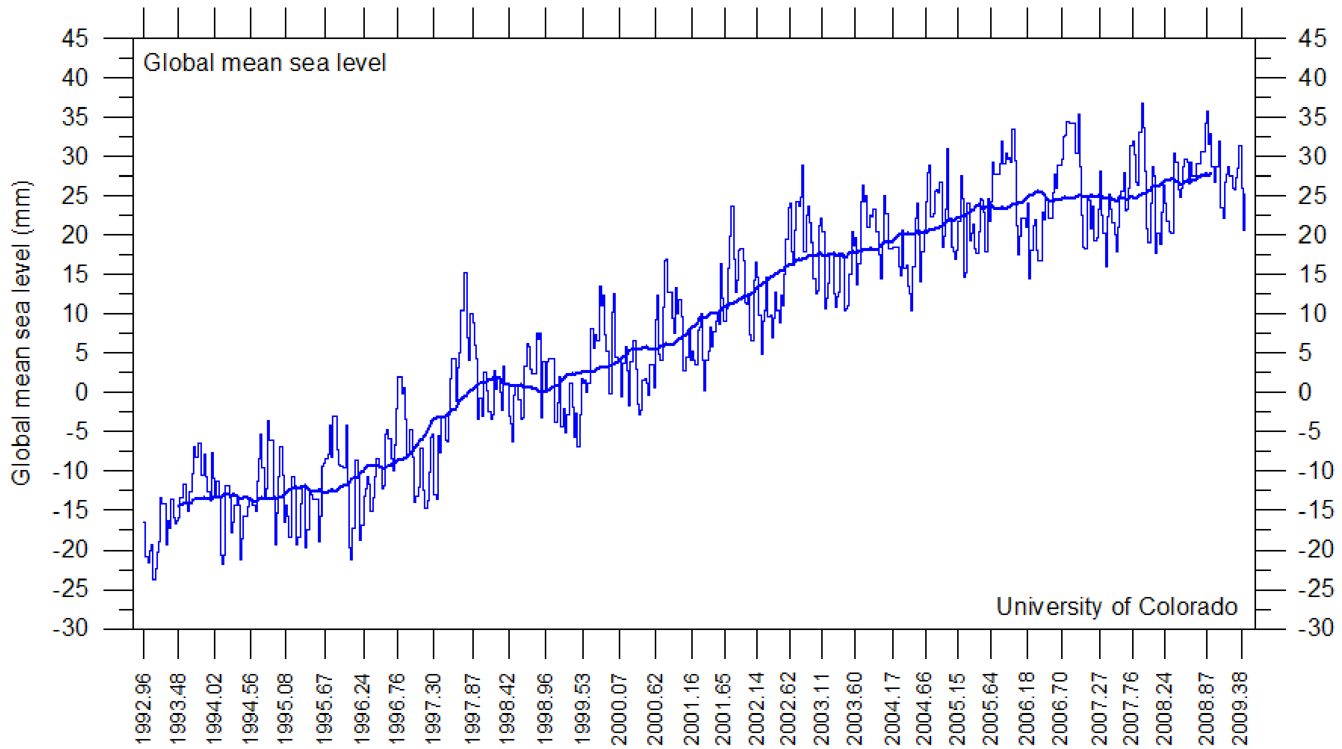


Graphs showing monthly Antarctic, Arctic and global sea ice extent since November 1978, according to the [National Snow and Ice data Center]() (NSIDC).

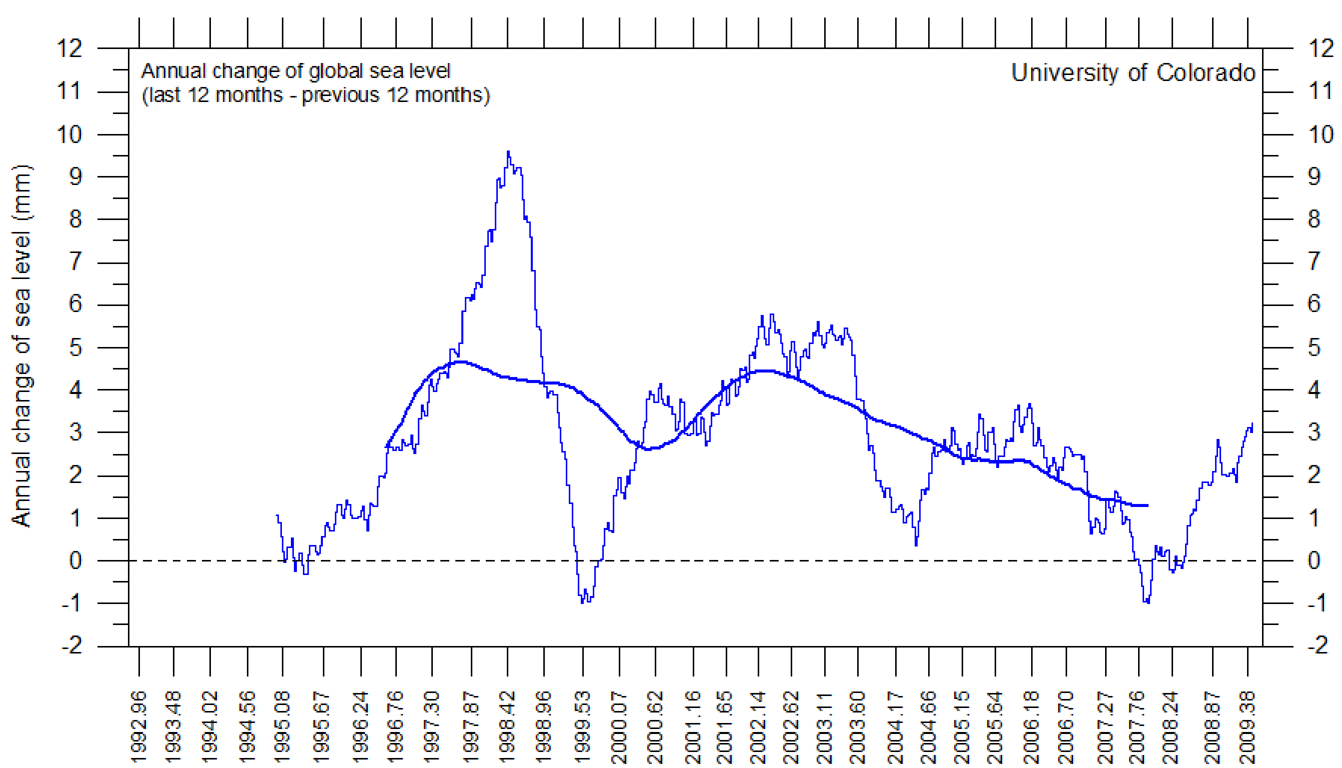


Graph showing daily Arctic sea ice extent since June 2002-25/10 2009, by courtesy of [Japan Aerospace Exploration Agency]() (JAXA).

Global sea level, updated September 2009

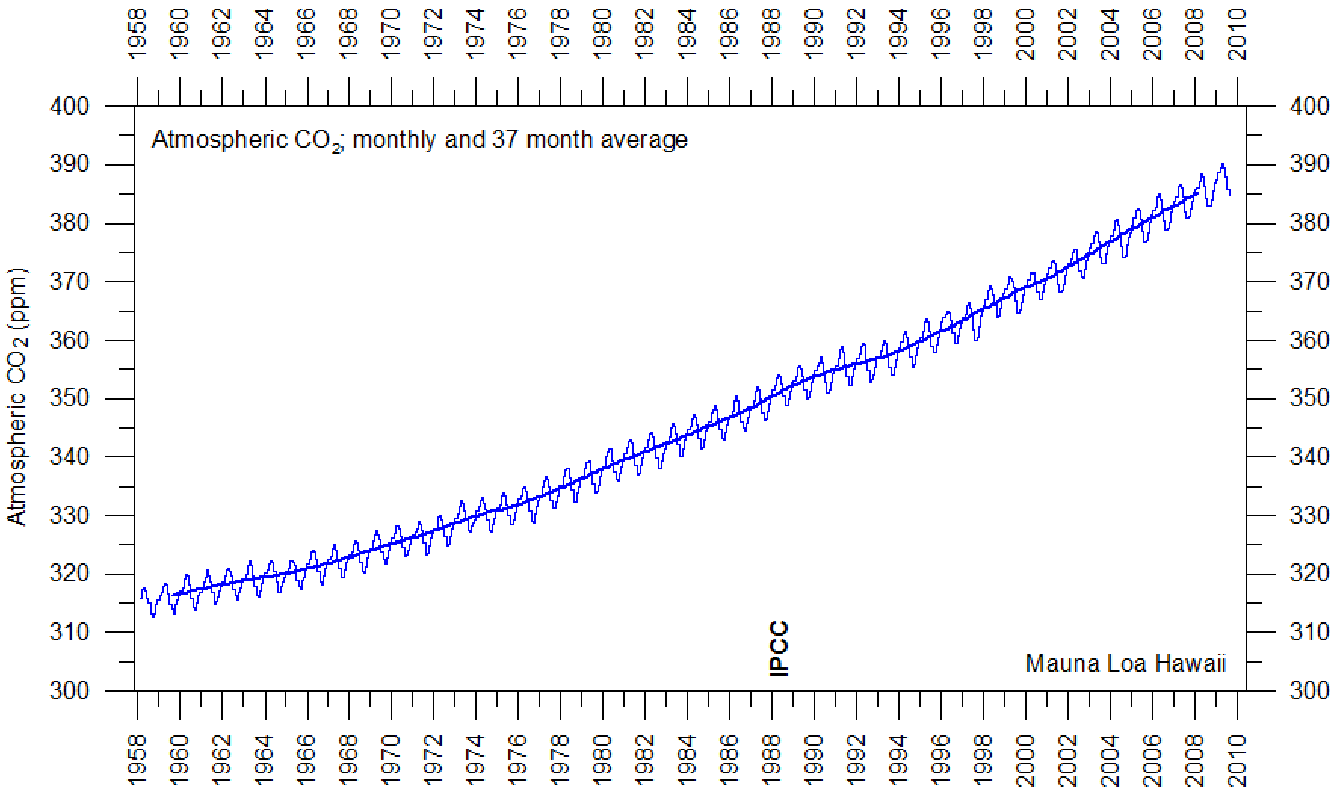


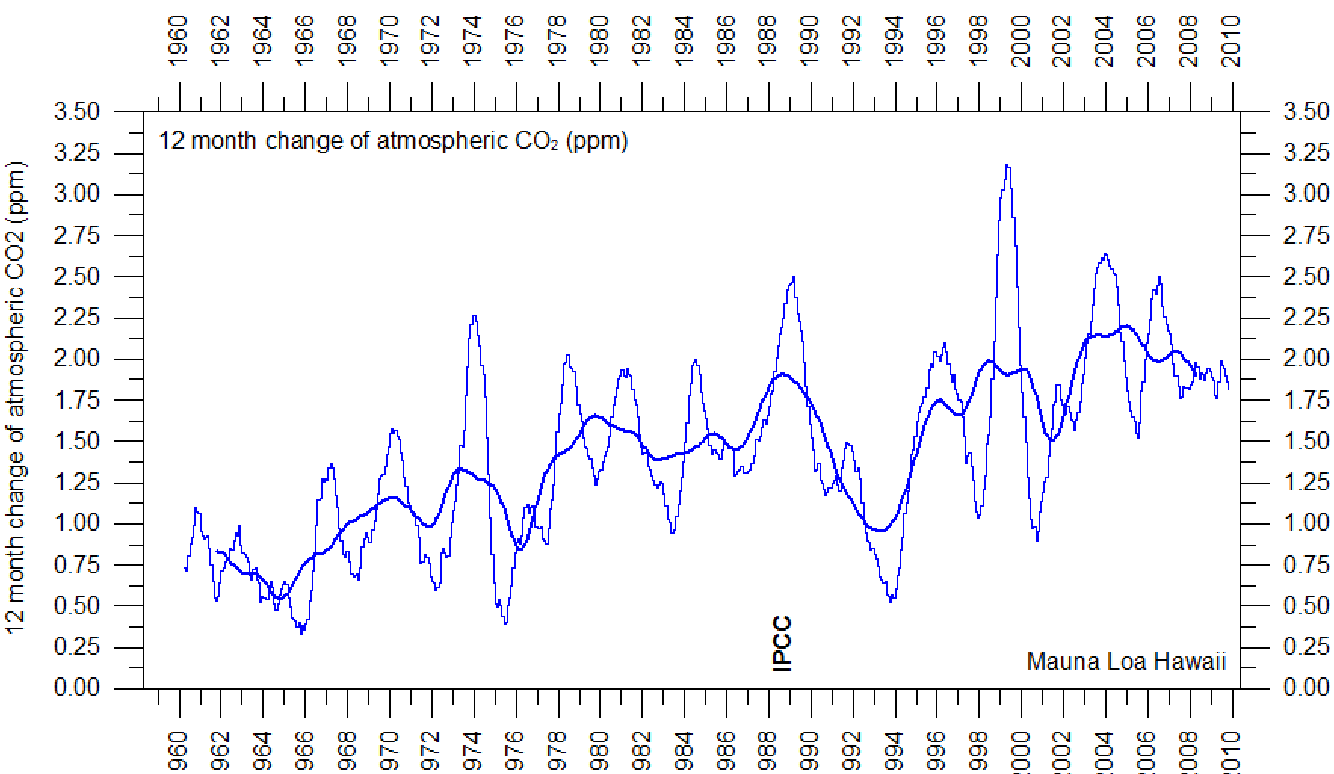
Globa lmonthly sea level since late 1992 according to the Colorado Center for Astrodynamics Research at University of Colorado at Boulder, USA. The thick line is the simple running 37 observation average, nearly corresponding to a running 3 yr average.



Annual change of global sea level since late 1992 according to the Colorado Center for Astrodynamics Research at University of Colorado at Boulder, USA. The thick line is the simple running 3 yr average.

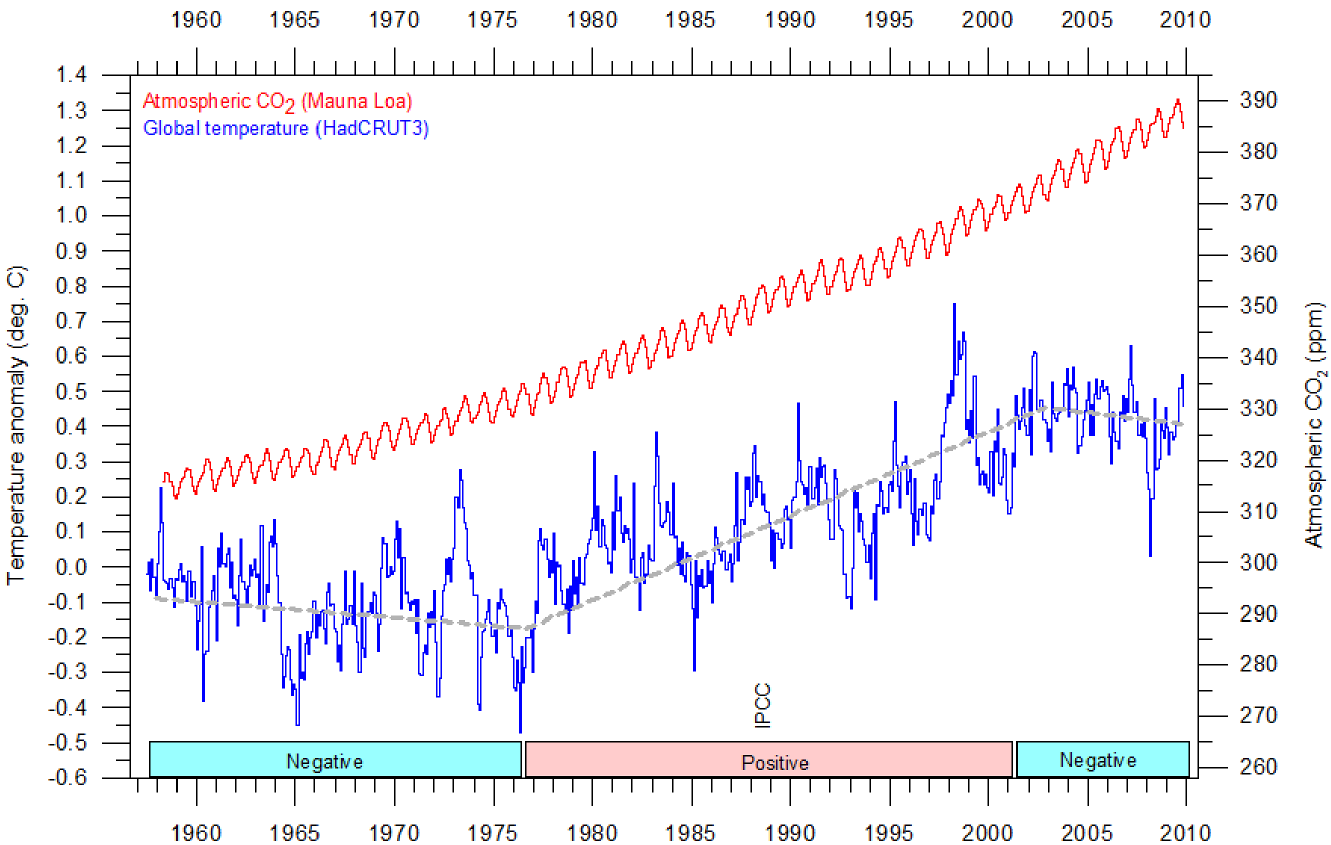
Atmospheric CO_2, updated to September 2009

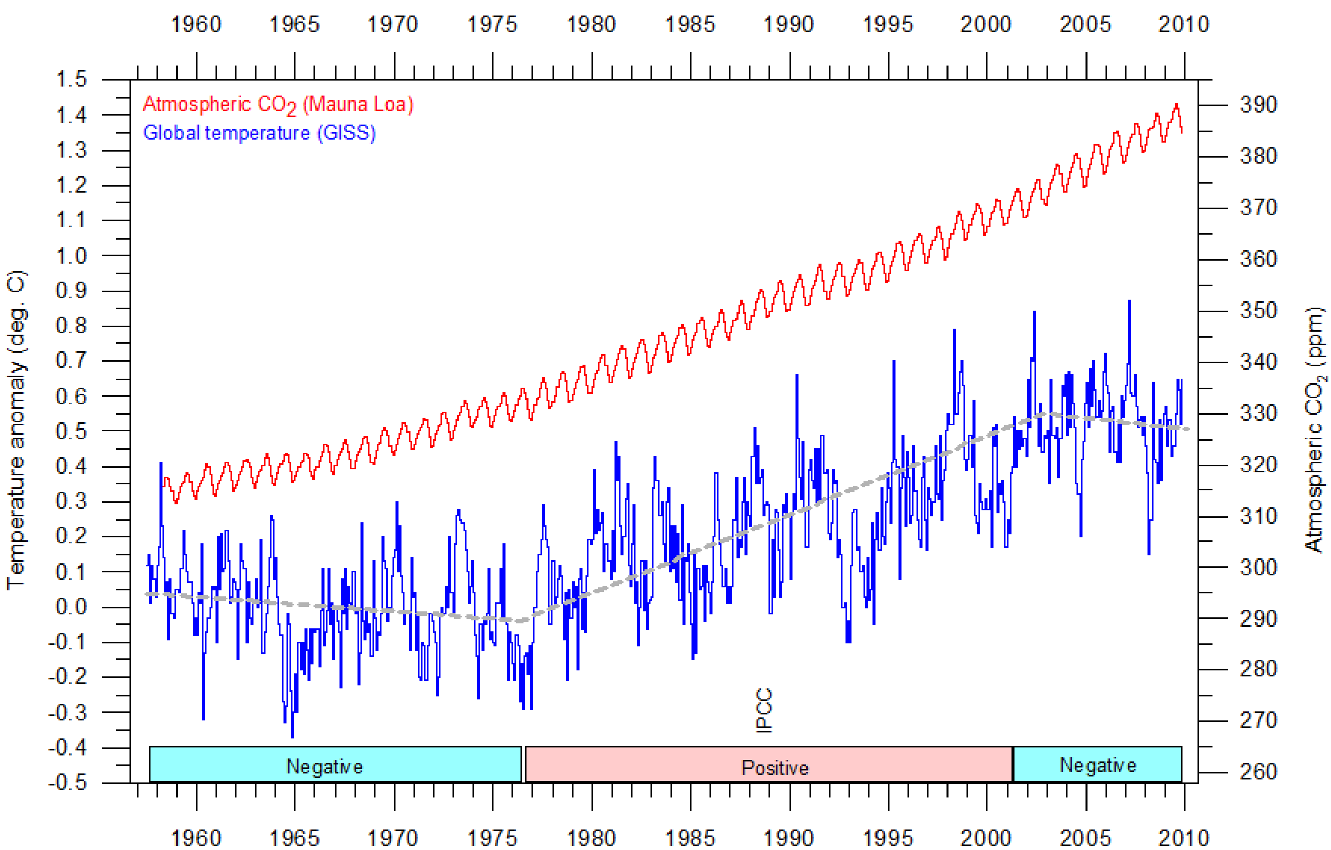


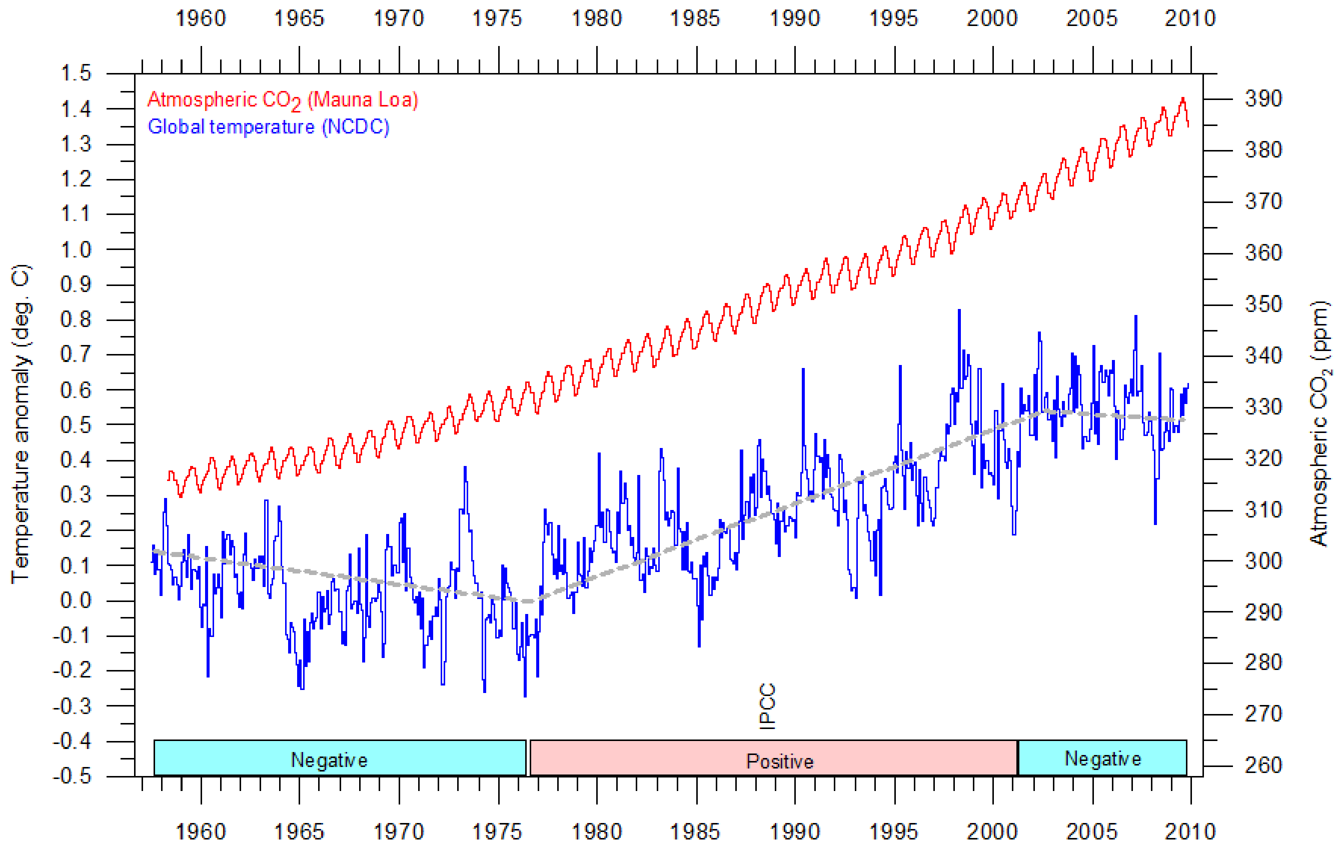


Monthly amount of atmospheric CO_2 (above) and annual growth rate (below; average last 12 months minus average preceding 12 months) of atmospheric CO_2 since 1959, according to data provided by the [Mauna Loa Observatory](), Hawaii, USA. The thick line is the simple running 37 observation average, nearly corresponding to a running 3 yr average.

Global surface air temperature and atmospheric CO_2, updated to September 2009







Diagrams showing HadCRUT3, GISS, and NCDC monthly global surface air temperature estimates (blue) and the monthly atmospheric CO_2 content (red) according to the [Mauna Loa Observatory](), Hawaii. The Mauna Loa data series begins in March 1958, and 1958 has therefore been chosen as starting year for the diagrams. Reconstructions of past atmospheric CO_2 concentrations (before 1958) are not incorporated in this diagram, as such past CO_2 values are derived by other means (ice cores, stomata, or older measurements using different methodology, and therefore are not directly comparable with modern atmospheric measurements. The dotted grey line indicates the approximate linear temperature trend, and the boxes in the lower part of the diagram indicate the relation between atmospheric CO_2 and global surface air temperature, negative or positive.

Most climate models assume the greenhouse gas carbon dioxide CO_2 to influence significantly upon global temperature. Thus, it is relevant to compare the different global temperature records with measurements of atmospheric CO_2, as shown in the diagrams above. Any comparison, however, should not be made on a monthly or annual basis, but for a longer time period, as other effects (oceanographic, clouds, etc.) may well override the potential influence of CO_2 on short time scales such as just a few years.

It is of cause equally inappropriate to present new meteorological record values, whether daily, monthly or annual, as support for the hypothesis ascribing high importance of atmospheric CO_2 for global temperatures. Any such short-period meteorological record value may well be the result of other phenomena than atmospheric CO_2.

What exactly defines the critical length of a relevant time period to consider for evaluating the alleged high importance of CO_2 remains elusive, and is still a topic for debate. The critical period length must, however, be inversely proportional to the importance of CO_2 on the global temperature, including feedback effects, such as assumed by most climate models.

After about 10 years of global temperature increase following global cooling 1940-1978, IPCC was established in 1988. Presumably, several scientists interested in climate then felt intuitively that their empirical and theoretical understanding of climate dynamics was sufficient to conclude about the importance of CO2 for global temperature. However, for obtaining public and political support for the CO_2-hyphotesis the 10 year warming period leading up to 1988 in all likelihood was important. Had the global temperature instead been decreasing, public support for the hypothesis would have been difficult to obtain. Adopting this approach as to critical time length, the varying relation (positive or negative) between global temperature and atmospheric CO_2 has been indicated in the lower panels of the three diagrams above.

Climate and history; one example among many

1812: Napoleon in Moscow (continued from last issue of Climate4you monthly report)

In the afternoon of 14 September, what was left of the Grande Armée entered Moscow. Napoleon took up residence at the Kremlin the following day. About two-thirds of the 270,184 inhabitants had left, and the remainder were hiding in their homes. Nobody with an official status was left to take care of a formal surrender and make arrangements for feeding the soldiers, as would normally be the case in a civilised war. To make things even worse, before leaving Moscow, the city commander Count Rostopchin had ordered his Police Superintendant Voronenko to burn not only the remaining supplies, but everything he could. Voronenko and his men set to work, presumably assisted by the city's criminal elements. The fire raged out of control and spread to several districts of the city. In the morning of 16 September flames were lapping around the walls of Kremlin, and Napoleon had to evacuate himself and take up residence in the Petrovsky Palace, a few kilometres outside Moscow.

Moscow burning 15-18 September 1812. On the 18 September Napoleon returns to Kremlin after having evacuated himself to the Petrovsky Palace outside Moscow. Oil paintings by Vereschagin.

After three days the fire began to abate, and on 18 September Napoleon rode back into Moscow. Two thirds of the city was destroyed by the fire, robbing him of a wealth of material resources. And there was still no delegation formally surrendering Moscow to him. Even worse, Tsar Alexander still apparently did not understand that Russia was defeated, and therefore had no ambitions of making peace with Napoleon. It was all very frustrating.

Napoleon now had to consider taking up winter quarters in Moscow. Alternatively he would have to retreat with his back home, a move which for political reasons was difficult. So for the time being, he choose to remain in Moscow, hoping that Alexander finally would come to his senses.

Napoleon had studied the available weather information, which told him that it normally did not get really cold until the beginning of December, so he did not feel any sense of urgency. What he did not realise, was how sudden low temperatures may come if a high pressure area settles over eastern Europe, pumping arctic air masses south across Russia, where the lack of high mountains leave the whole country open for arctic air masses. In addition, he had no experience of temperature being only one factor, but that the wind strength also had to be taken into account.

Early October 1812 the weather remained to be fine and warm, and Napoleon was teasing Armand Caulaincourt, his finest civilian aide, about his anxiety about the winter climate. On 13 October, however, the weather suddenly turned cold, and Moscow was covered in a blanket of thin snow. Presumably this was a meteorological surprise to Napoleon, and it rapidly made him make up his mind. The same day he declared that the army would leave as rapid as possible, and take up winter quarters further west, where well-stocked bases were at hand in Minsk and Vilna. Napoleons army left Moscow 20 October.

To be continued in next issue of Climate4you monthly report.

References

Zamyski, A. 2005. 1812 - Napoleon's Fatal March on Moscow. Harper Perennial, London, 644 pp.

All above diagrams with supplementary information (including links to data sources) are available on www.climate4you.com

Yours sincerely, Ole Humlum (Ole.Humlum@geo.uio.no)

26 October 2009.