Climate4you update August 2010

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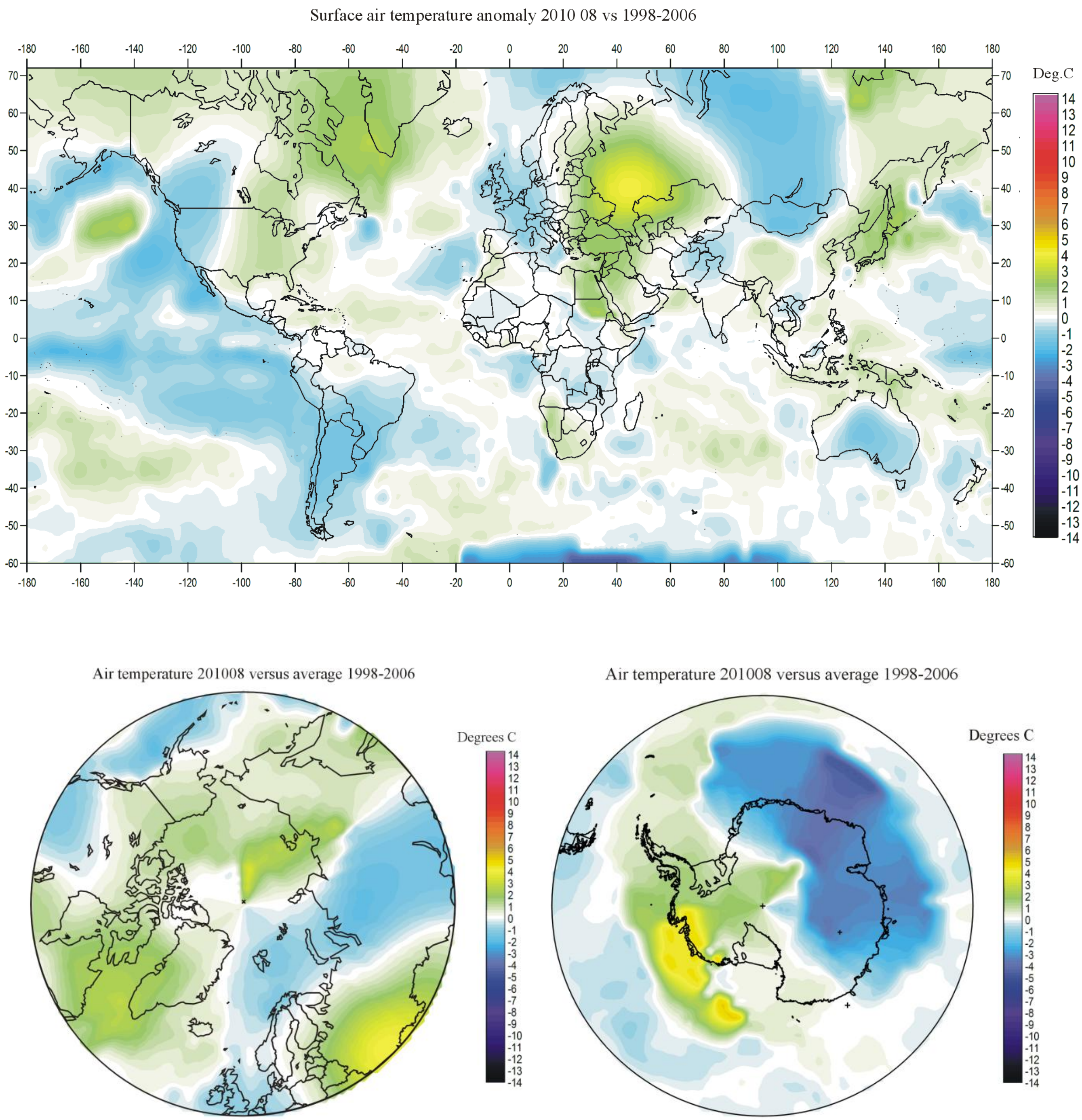
August 2010 global surface air temperature overview



August 2010 surface air temperature compared to the average for August 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)

Comments to the August 2010 global surface air temperature overview

This newsletter contains graphs showing a selection of key meteorological variables for August 2010. All temperatures are given in degrees Celsius.

In the above maps showing the geographical pattern of surface air temperatures, the period 1998-2006 is used as reference period. The reason for comparing with this recent period instead of the official WMO 'normal' period 1961-1990, is that the latter period is affected by the relatively cold period 1945-1980. Almost any comparison with such a low average value will therefore appear as high or warm, and it will be difficult to decide if modern surface air temperatures are increasing or decreasing. Comparing with a more recent period overcomes this problem. In addition to this consideration, the recent temperature development suggests that the time window 1998-2006 may roughly represent a global temperature peak. If so, negative temperature anomalies will gradually become more and more widespread as time goes on. However, if positive anomalies instead gradually become more widespread, this reference period only represented a temperature plateau.

In the other diagrams in this newsletter the thin line represents the monthly global average value, and the thick line indicate a simple running average, in most cases a 37-month average, almost corresponding to three years.

The year 1979 has been chosen as starting point in several of the diagrams, as this roughly corresponds to both the beginning of satellite observations and the onset of the late 20th century warming period.

Global surface air temperatures August 2010 in the Northern Hemisphere was characterised by relatively warm conditions in most of North America, except areas along the Pacific coast, which were relatively cold. Western and central Europe was cold, while Eastern Europe and Western Russia was warm. Central Siberia was relatively cold, while Eastern Siberia was relatively warm.

As usual, the Southern Hemisphere experienced smaller regional temperature contrasts than the Northern Hemisphere, but was in general relatively cold. Especially South America and Australia experienced below average temperatures.

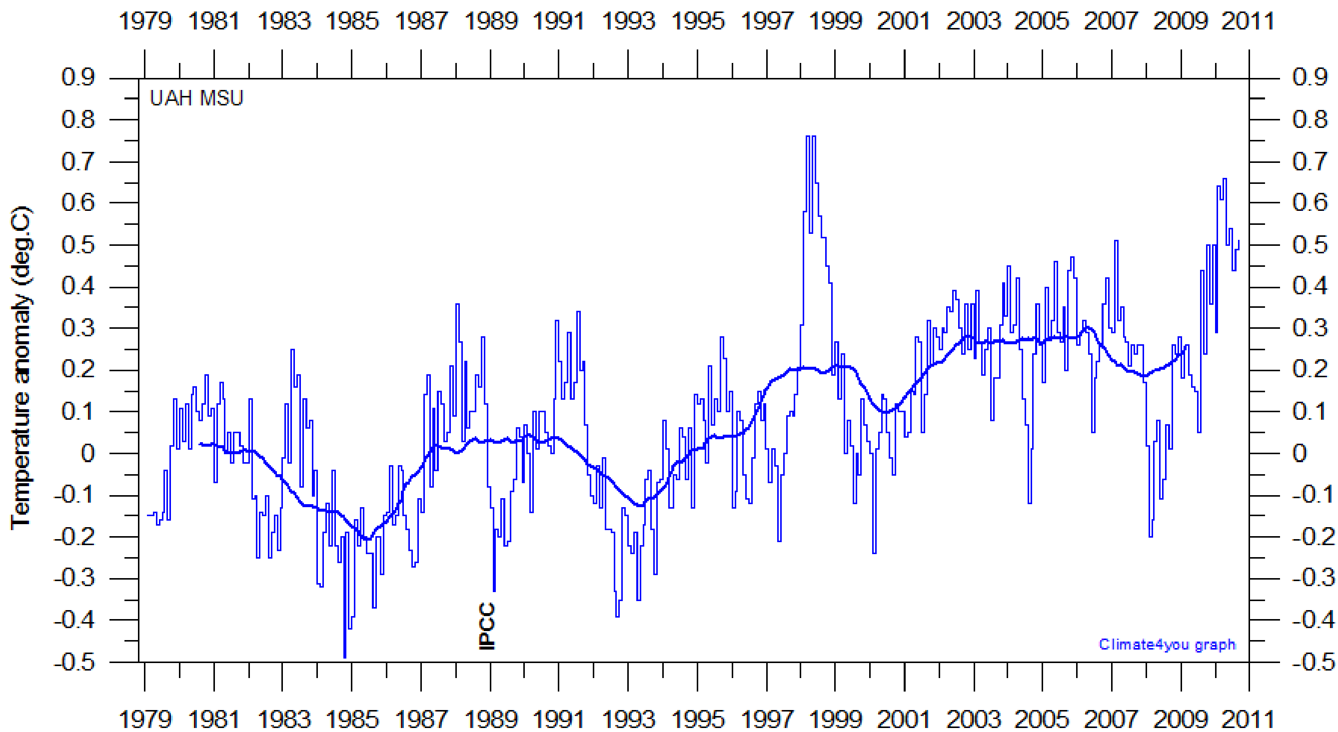
Conditions near Equator were influenced by the end of the previous El Niño in the Pacific Ocean. Relatively low temperatures therefore characterised most of the Equatorial regions.

In the Arctic relatively low temperatures characterised the Europe-Russia-Western Sibir sector, while relatively high temperatures characterised the Alaska-Eastern Siberia sector. The Greenland-Canada sector was near average conditions for the reference period 1998-2006.

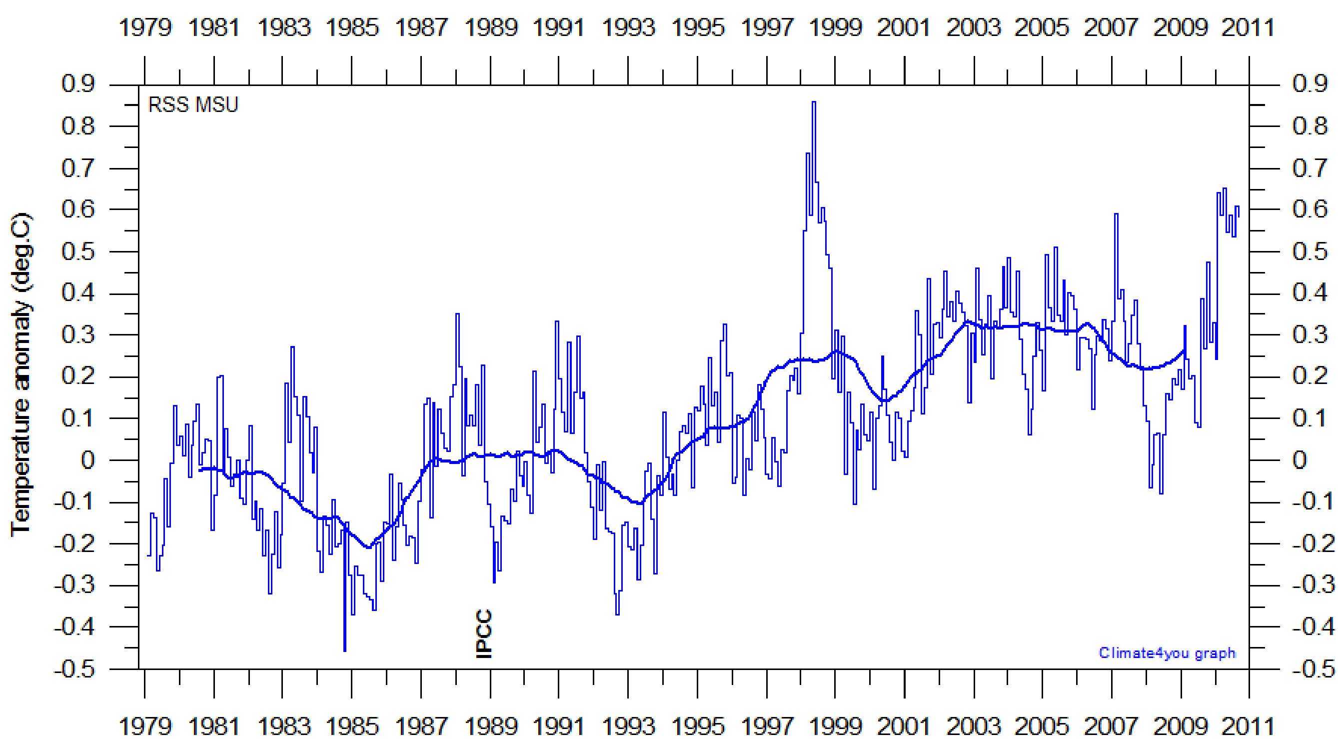
In the Antarctic relatively cold conditions characterised most of the East Antarctic, while West Antarctic and the Peninsula was relatively warm.

All diagrams shown in this newsletter are available for download on www.climate4you.com

[Lower troposphere temperature from satellites, updated to August 2010]

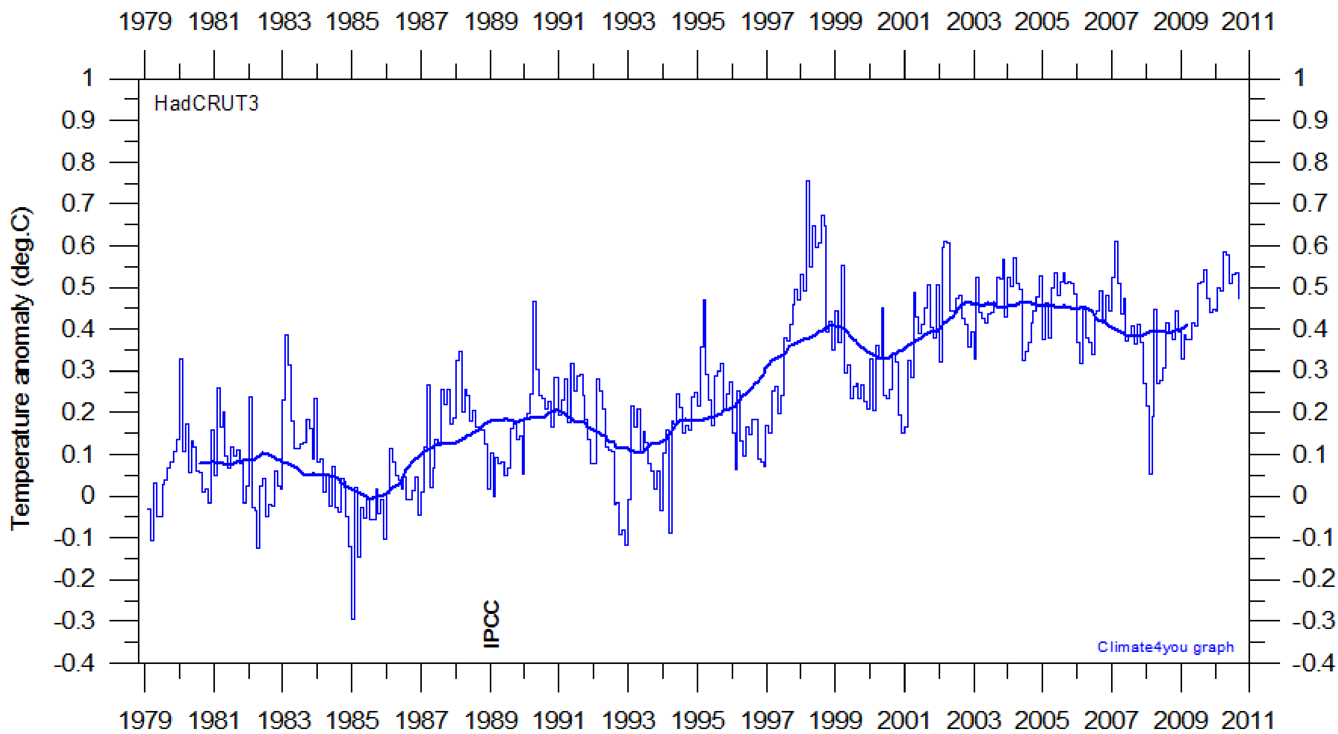


Global monthly average lower troposphere temperature (thin line) since 1979 according to [University of Alabama] at Huntsville, USA. The thick line is the simple running 37 month average.

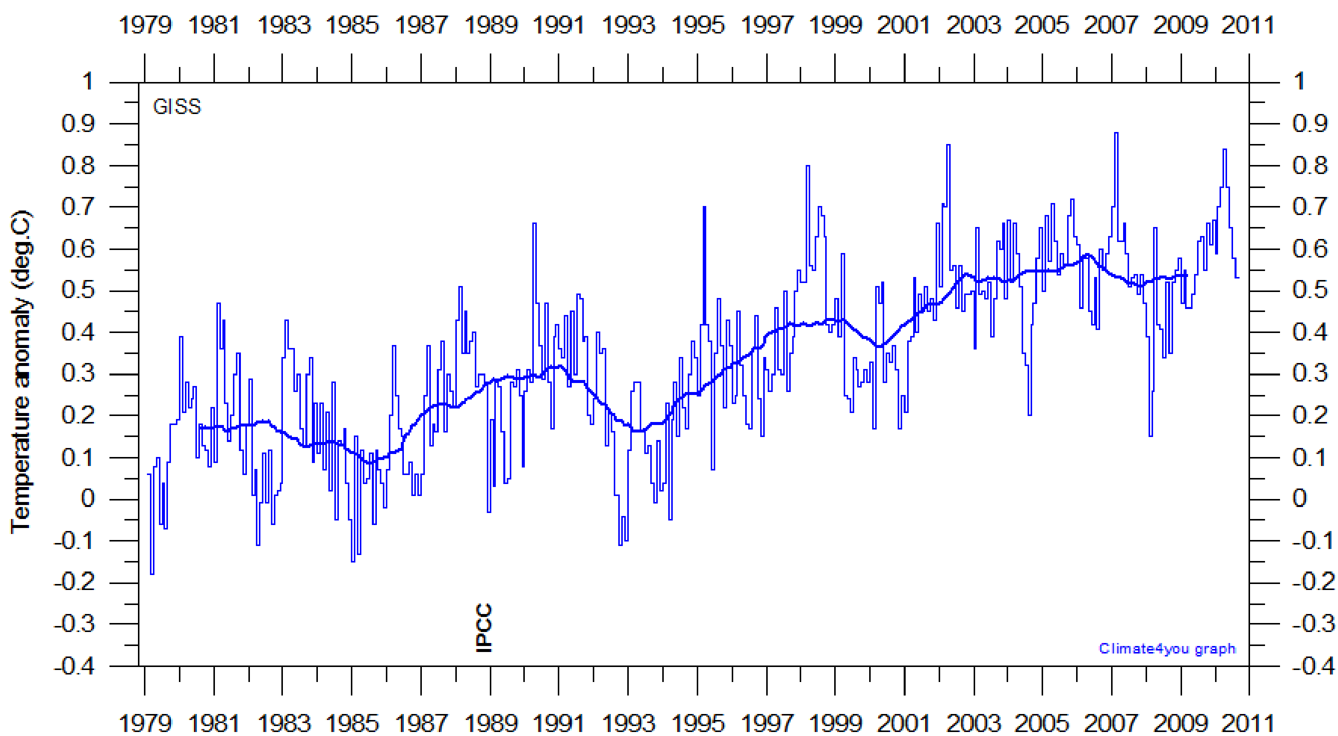


Global monthly average lower troposphere temperature (thin line) since 1979 according to according to [Remote Sensing Systems] (RSS), USA. The thick line is the simple running 37 month average.

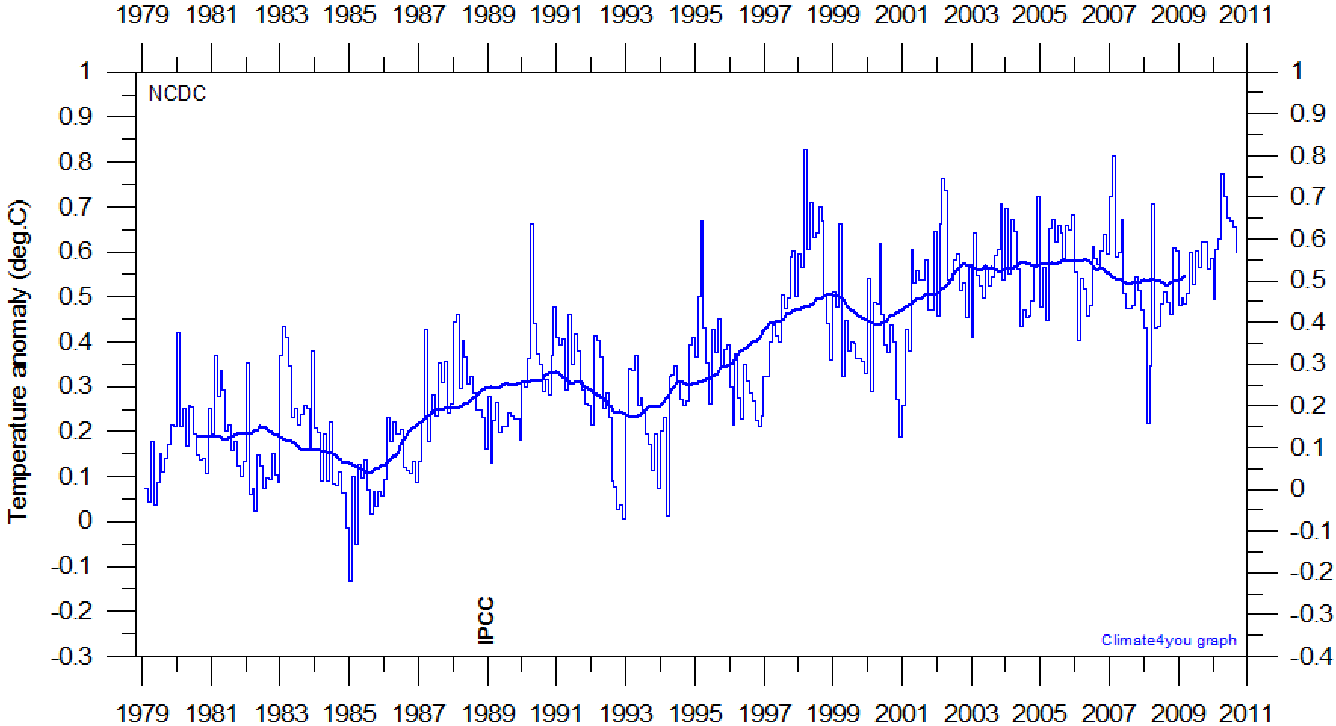
[Global surface air temperature, updated to August 2010]



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.



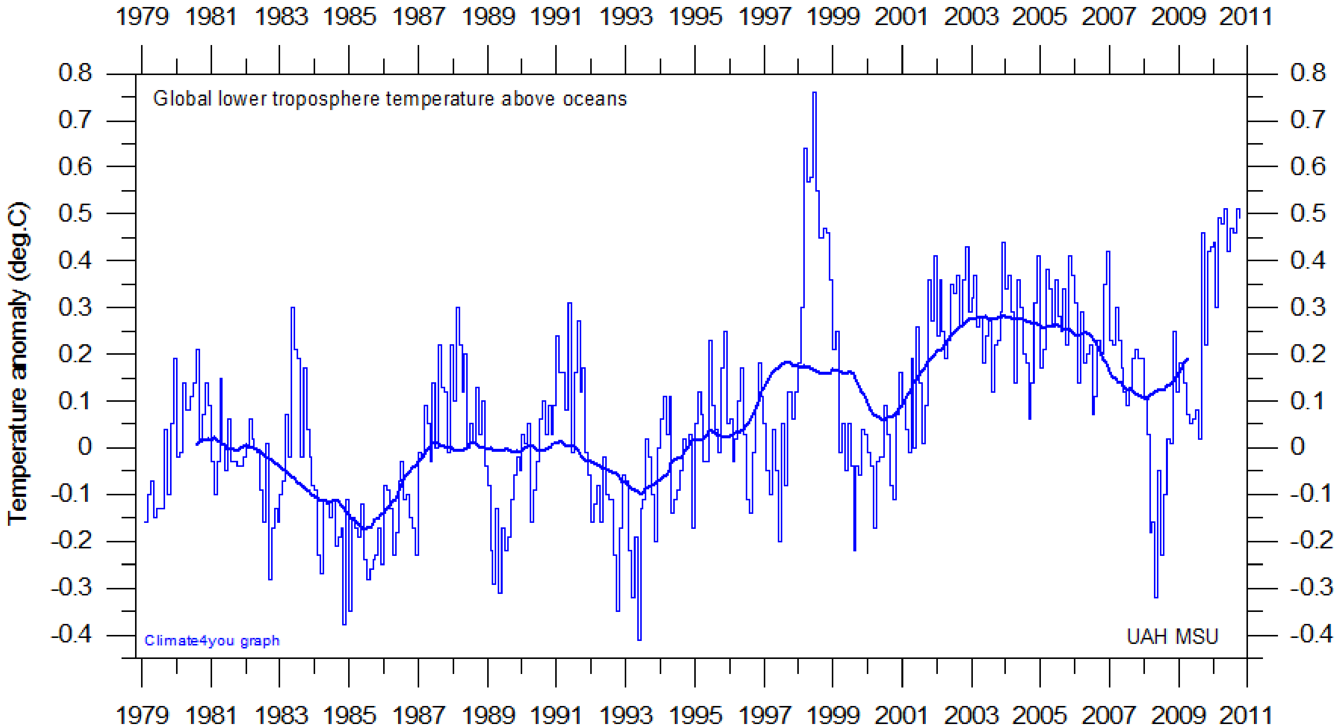
Global monthly average surface air temperature (thin line) since 1979 according to according to the [Goddard Institute for Space Studies] (GISS), at Columbia University, New York City, USA. The thick line is the simple running 37 month average.



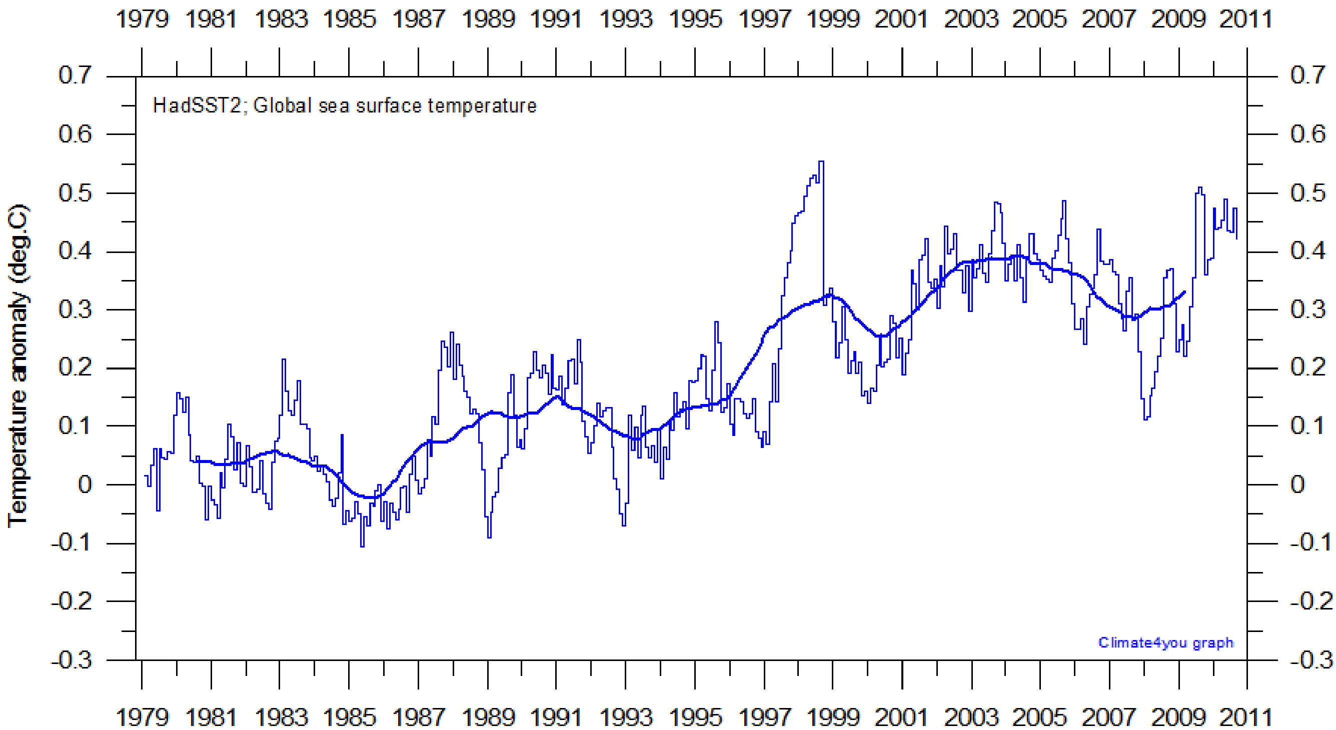
Global monthly average surface air temperature since 1979 according to according to the National Climatic Data Center (NCDC), USA. The thick line is the simple running 37 month average.

Some readers have noted that several of the above data series display changes when one compare with previous issues of this newsletter, not only for the most recent months, but actually for most of months included in the data series. The interested reader may find more on this lack of temporal stability on www.climate4you (go to: Global Temperature and then Temporal Stability).

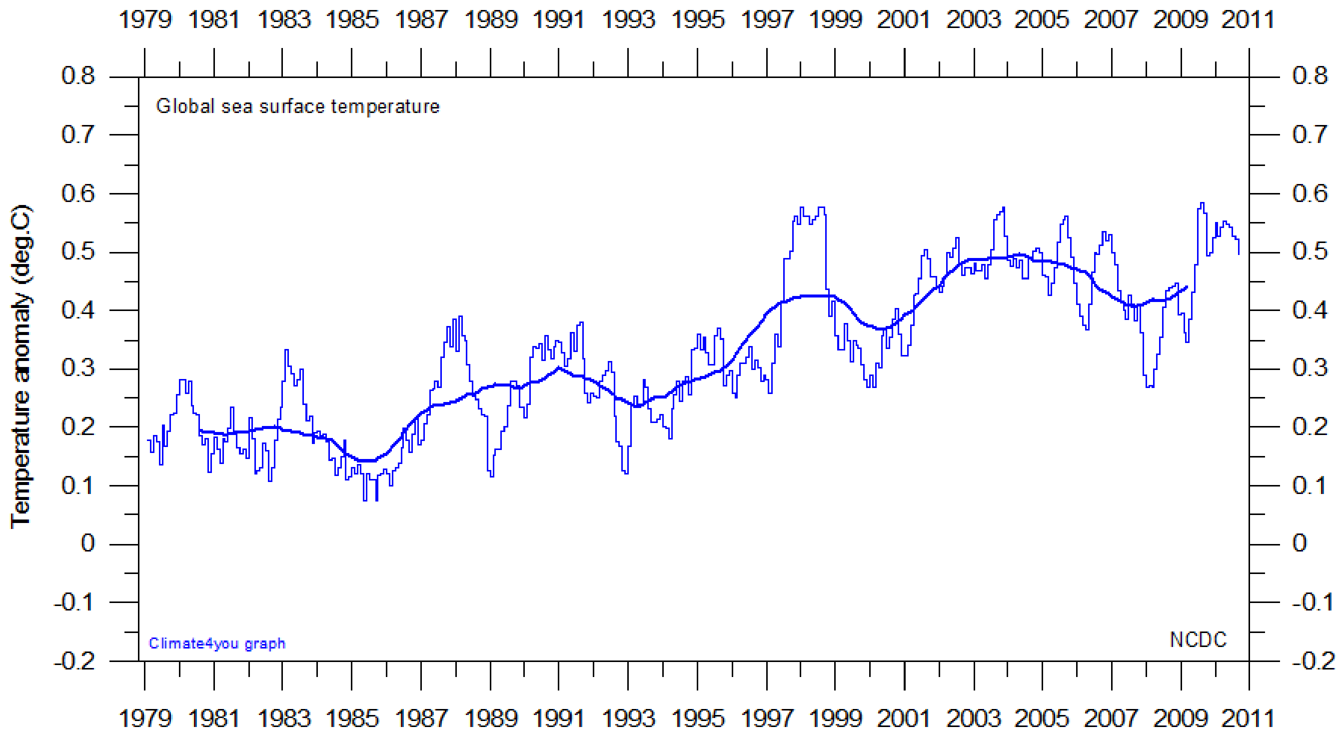
Global sea surface temperature, updated to August 2010



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.

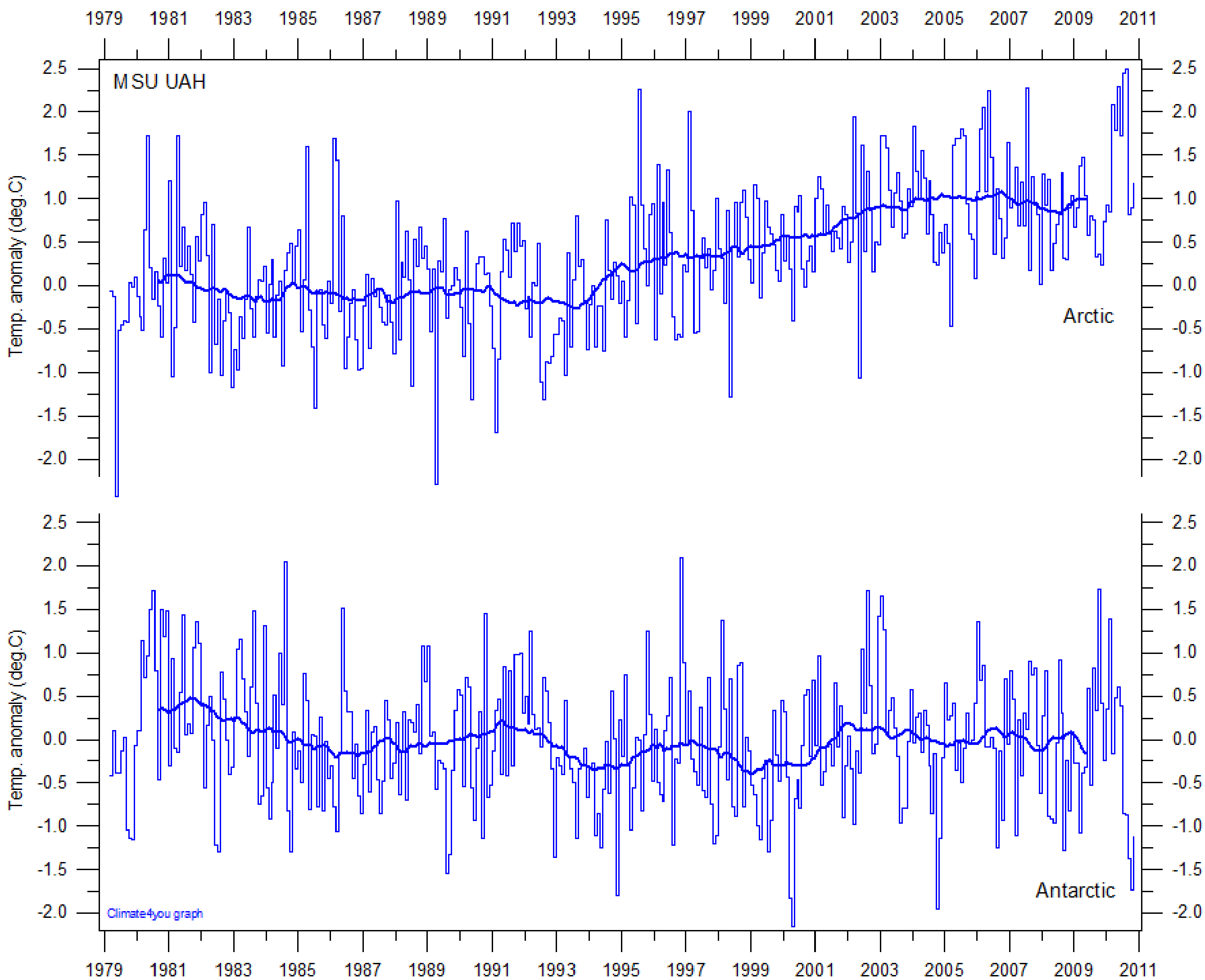


Global monthly average sea surface temperature since 1979 according to University of East Anglia's Climatic Research Unit (CRU), UK. Base period: 1961-1990. The thick line is the simple running 37 month average.



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 August 2010



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 July 2010](#)

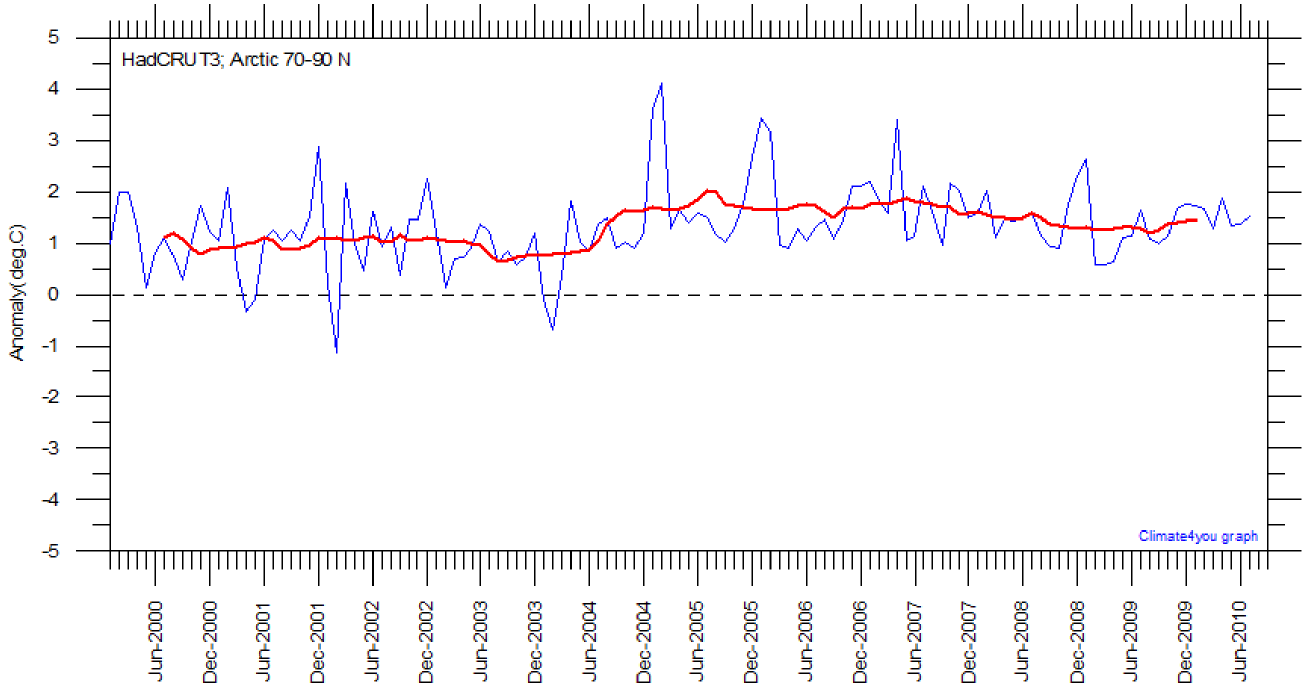


Diagram showing Arctic monthly surface air temperature anomaly 70-90°N since January 2000, in relation to the WMO reference "normal" period 1961-1990. The thin blue line shows the monthly temperature anomaly, while the thicker red line shows the running 13 month average. Data provided by the Hadley Centre for Climate Prediction and Research and the University of East Anglia's [Climatic Research Unit](#) ([CRU](#)), UK. Please note that this data series has not yet been updated beyond July 2010.

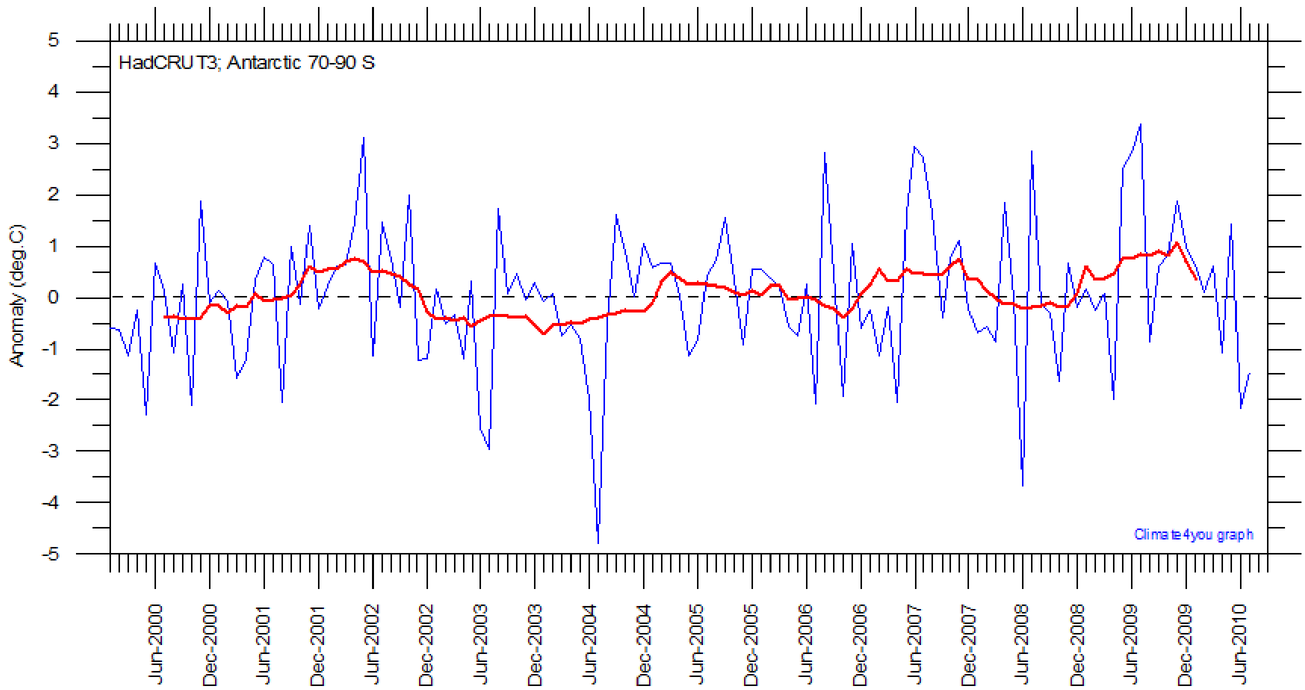


Diagram showing Antarctic monthly surface air temperature anomaly 70-90°S since January 2000, in relation to the WMO reference "normal" period 1961-1990. The thin blue line shows the monthly temperature anomaly, while the thicker red line shows the running 13 month average. Data provided by the Hadley Centre for Climate Prediction and Research and the University of East Anglia's [Climatic Research Unit](#) ([CRU](#)), UK. Please note that this data series has not yet been updated beyond July 2010.

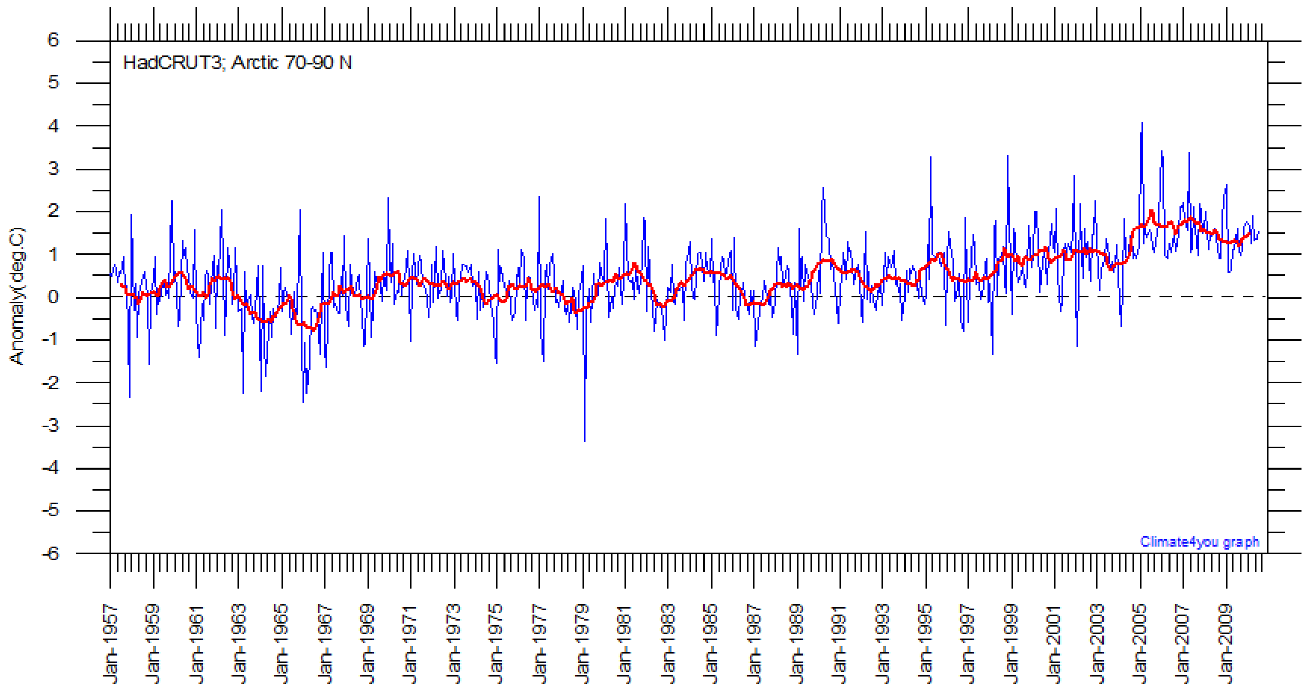


Diagram showing Arctic monthly surface air temperature anomaly 70-90°N since January 1957, in relation to the WMO reference "normal" period 1961-1990. The year 1957 has been chosen as starting year, to ensure easy comparison with the maximum length of the realistic Antarctic temperature record shown 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. Please note that this data series has not yet been updated beyond July 2010.

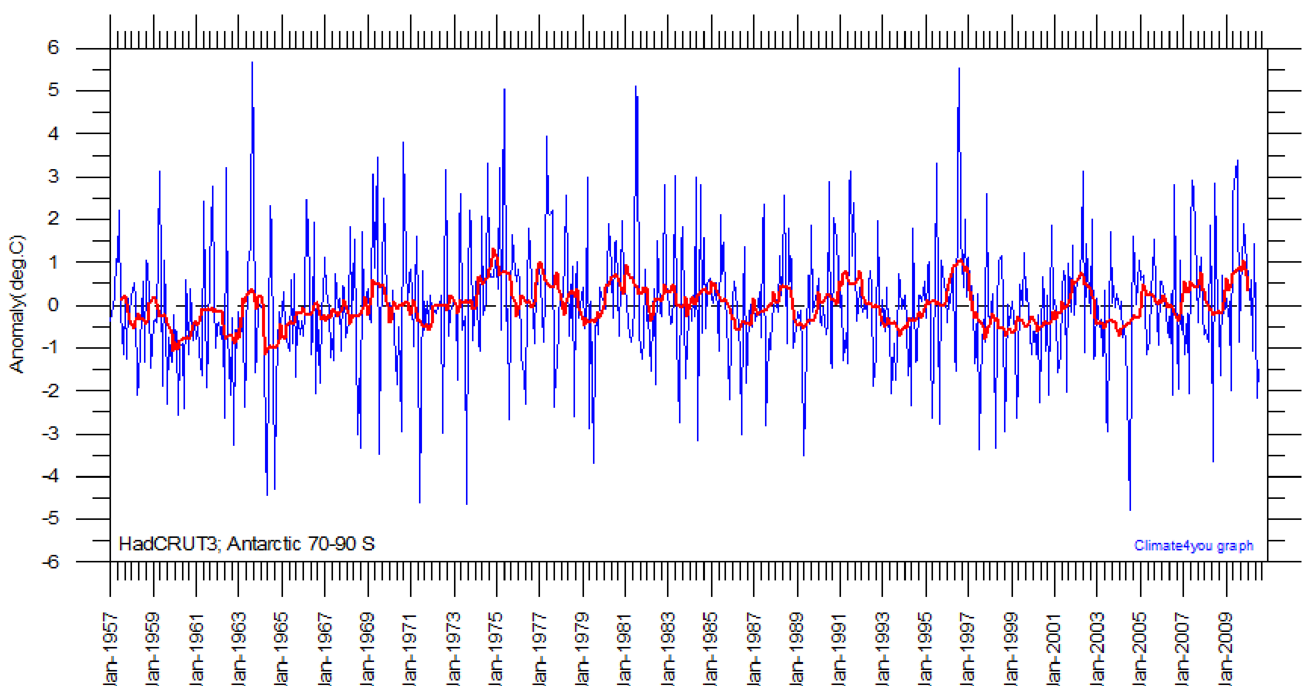


Diagram showing Antarctic monthly surface air temperature anomaly 70-90°S since January 1957, in relation to the WMO reference "normal" period 1961-1990. The year 1957 was an international geophysical year, and several meteorological stations were established in the Antarctic because of this. Before 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. Please note that this data series has not yet been updated beyond July 2010.

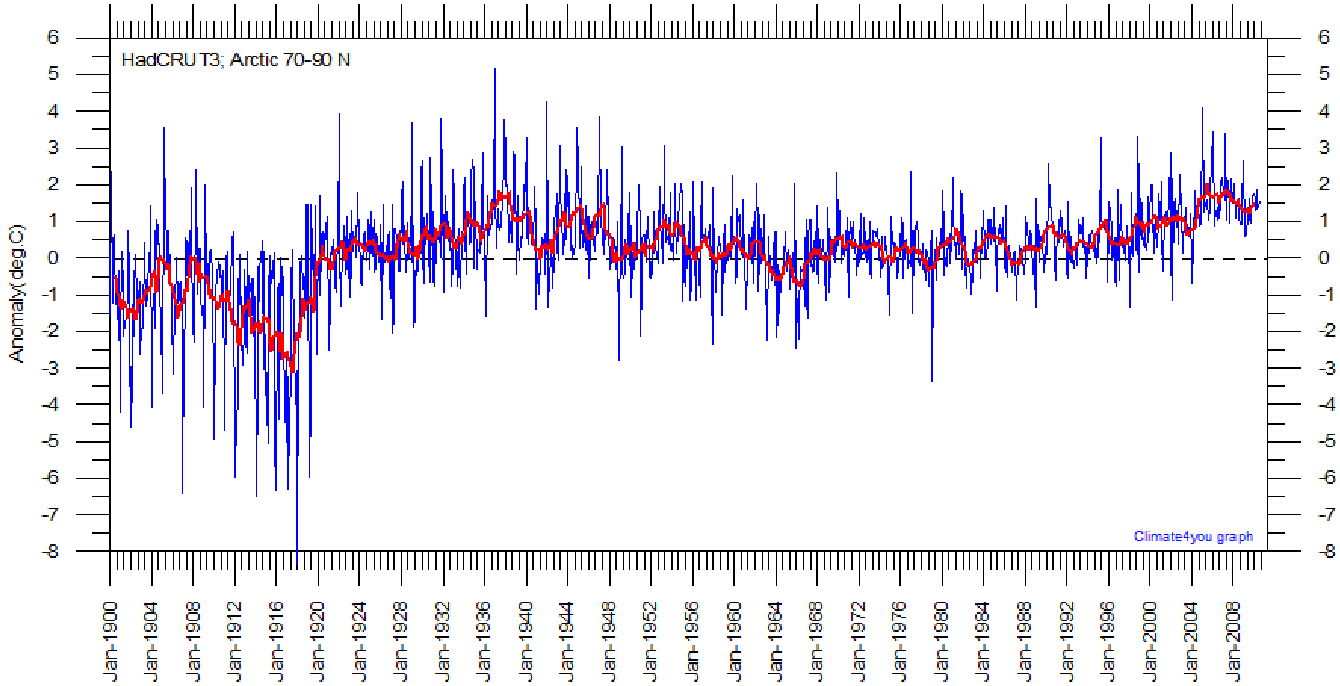


Diagram showing Arctic monthly surface air temperature anomaly 70-90°N since January 1900, in relation to the WMO reference "normal" period 1961-1990. The thin blue line shows the monthly temperature anomaly, while the thicker red line shows the running 13 month average. In general, the range of monthly 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. Please note that this data series has not yet been updated beyond July 2010.

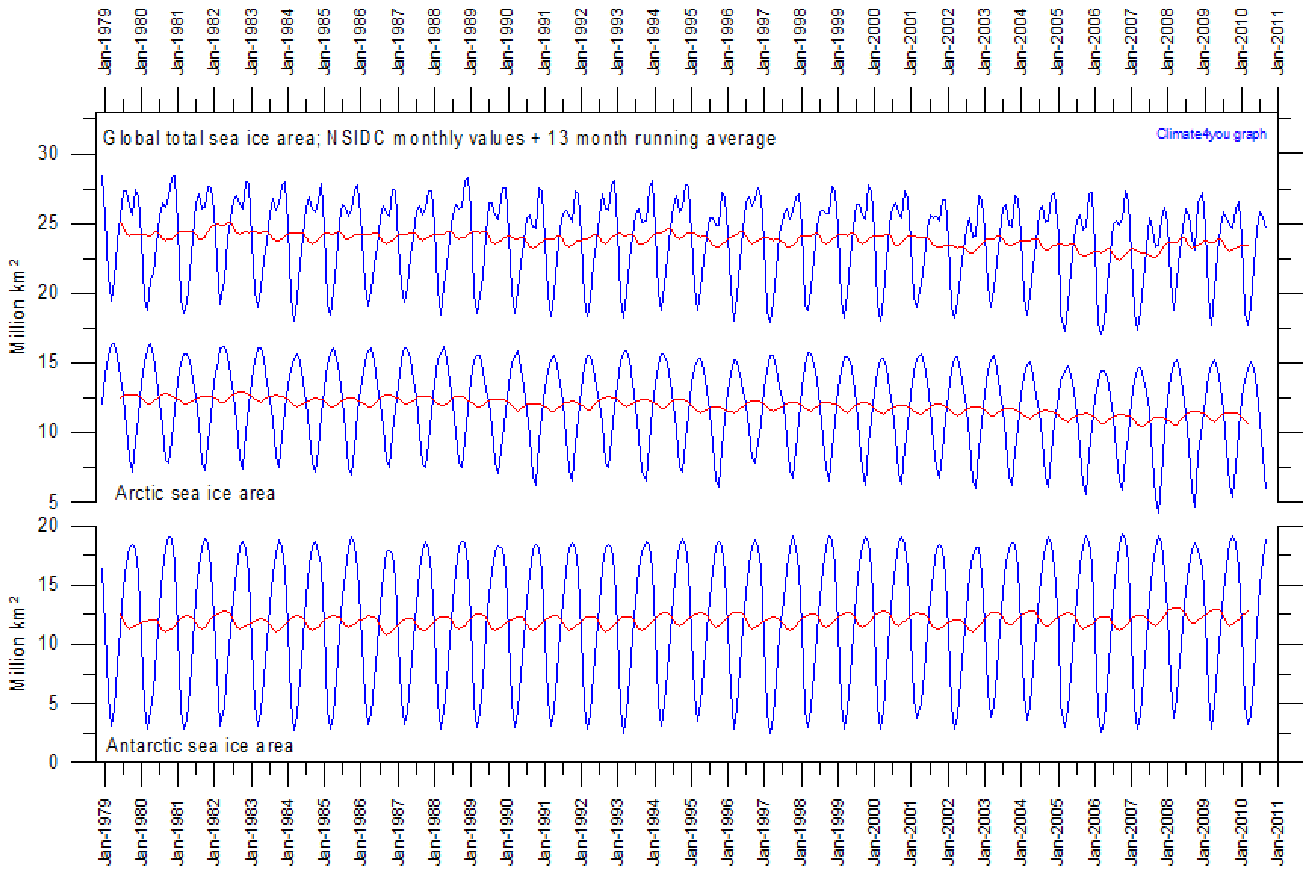
In general, the Arctic temperature record appears to be less variable than the contemporary Antarctic record, presumably at least partly due to the higher number of meteorological stations north of 70°N, compared to the number of stations south of 70°S.

As data coverage is sparse in the Polar Regions, the procedure of Gillet et al. 2008 has been followed, giving equal weight to data in each 5°x5° grid cell when calculating means, with no weighting by the areas of the grid dells.

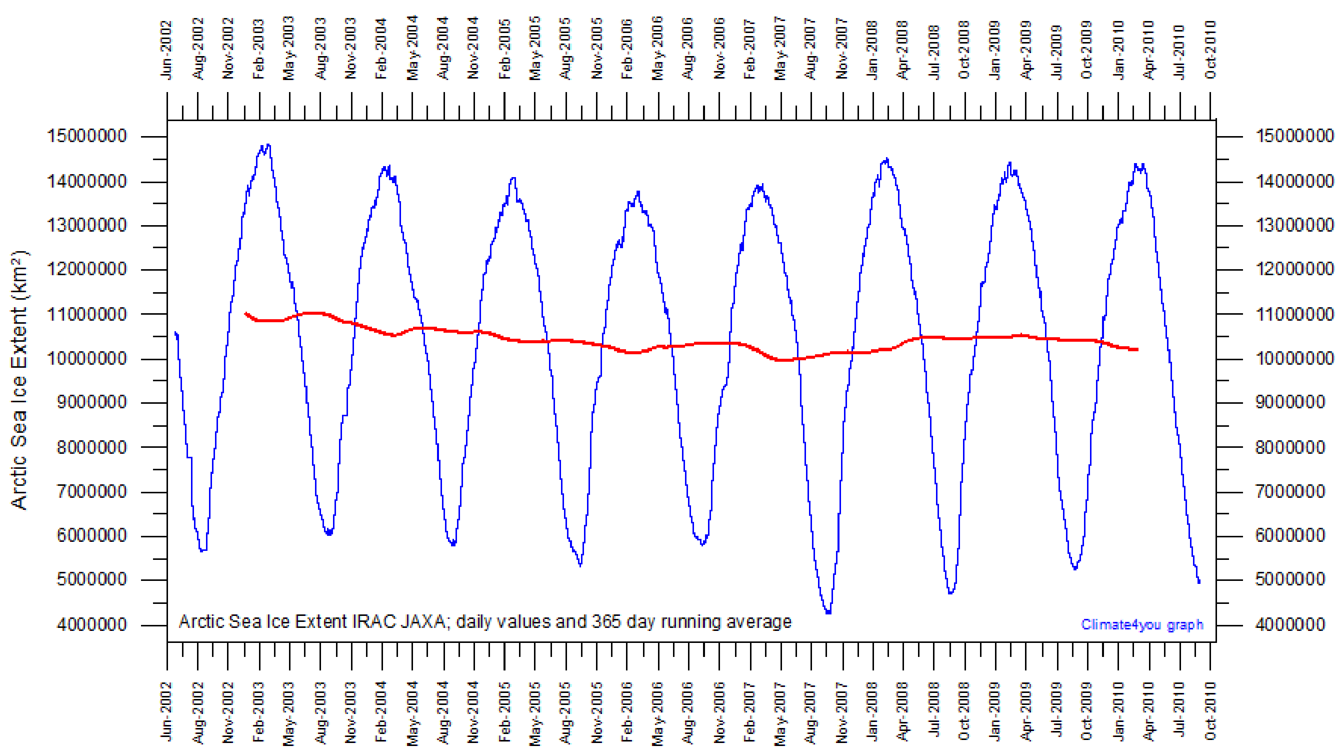
Litterature:

Gillett, N.P., Stone, D.A., Stott, P.A., Nozawa, T., Karpechko, A.Y.U., Hegerl, G.C., Wehner, M.F. and Jones, P.D. 2008. Attribution of polar warming to human influence. *Nature Geoscience* 1, 750-754.

[Arctic and Antarctic sea ice, updated to Auhust 2010](#)

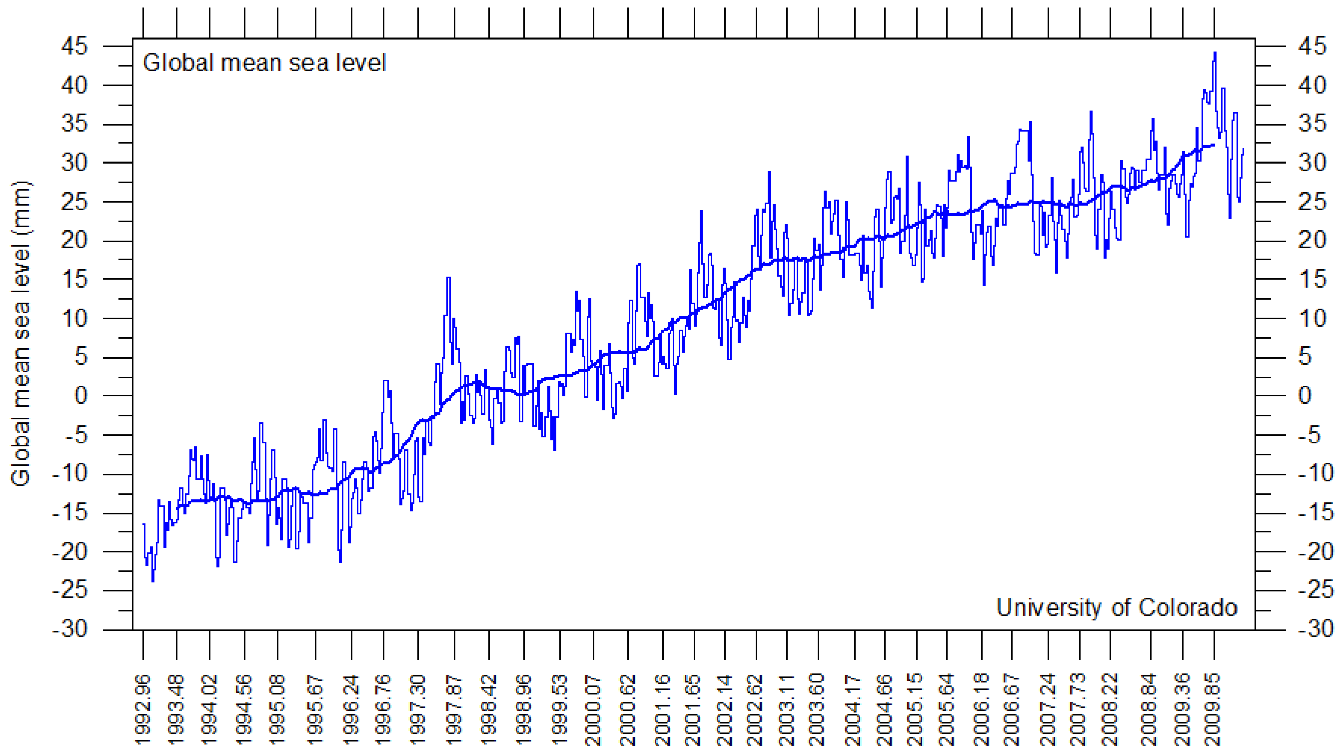


Graphs showing monthly Antarctic, Arctic and global sea ice extent since November 1978, according to the [National Snow and Ice data Center](#) (NSIDC).



Graph showing daily Arctic sea ice extent since June 2002, to 15/09 2010, by courtesy of [Japan Aerospace Exploration Agency](#) (JAXA).

Global sea level, updated to July 2010



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.

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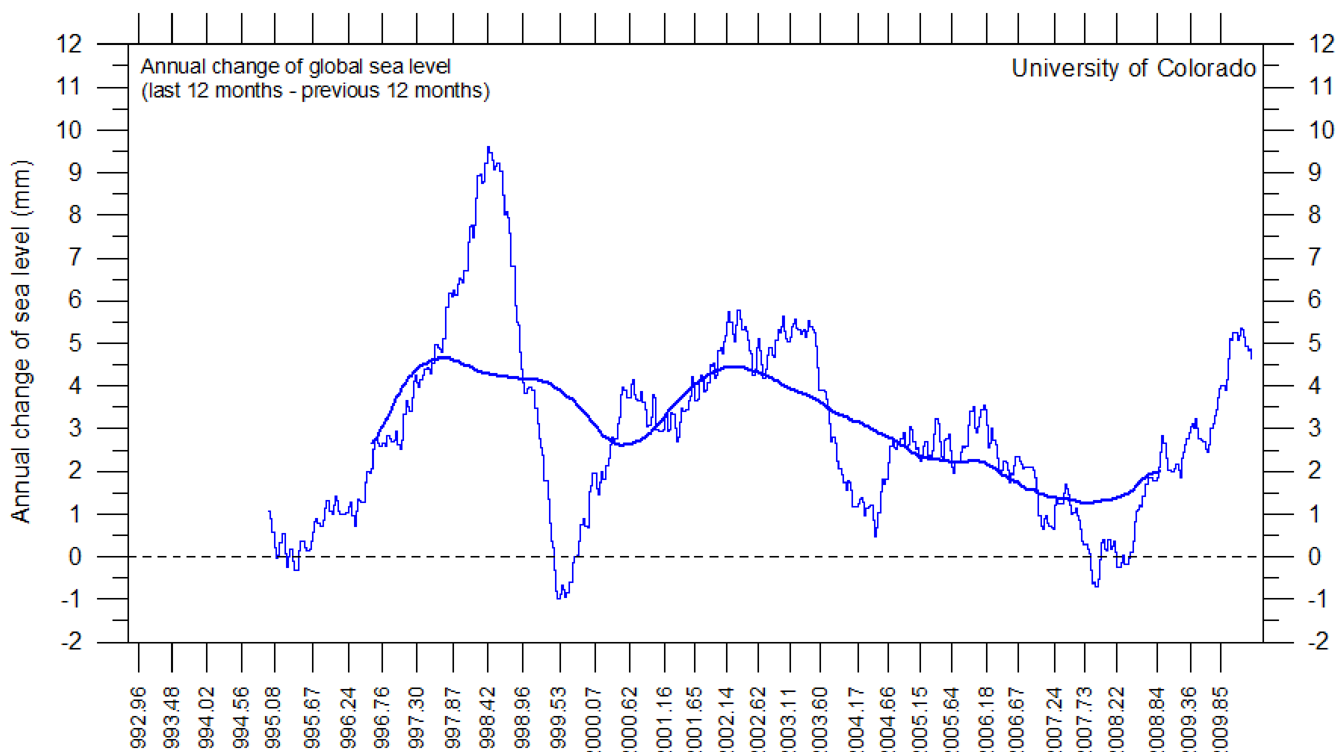
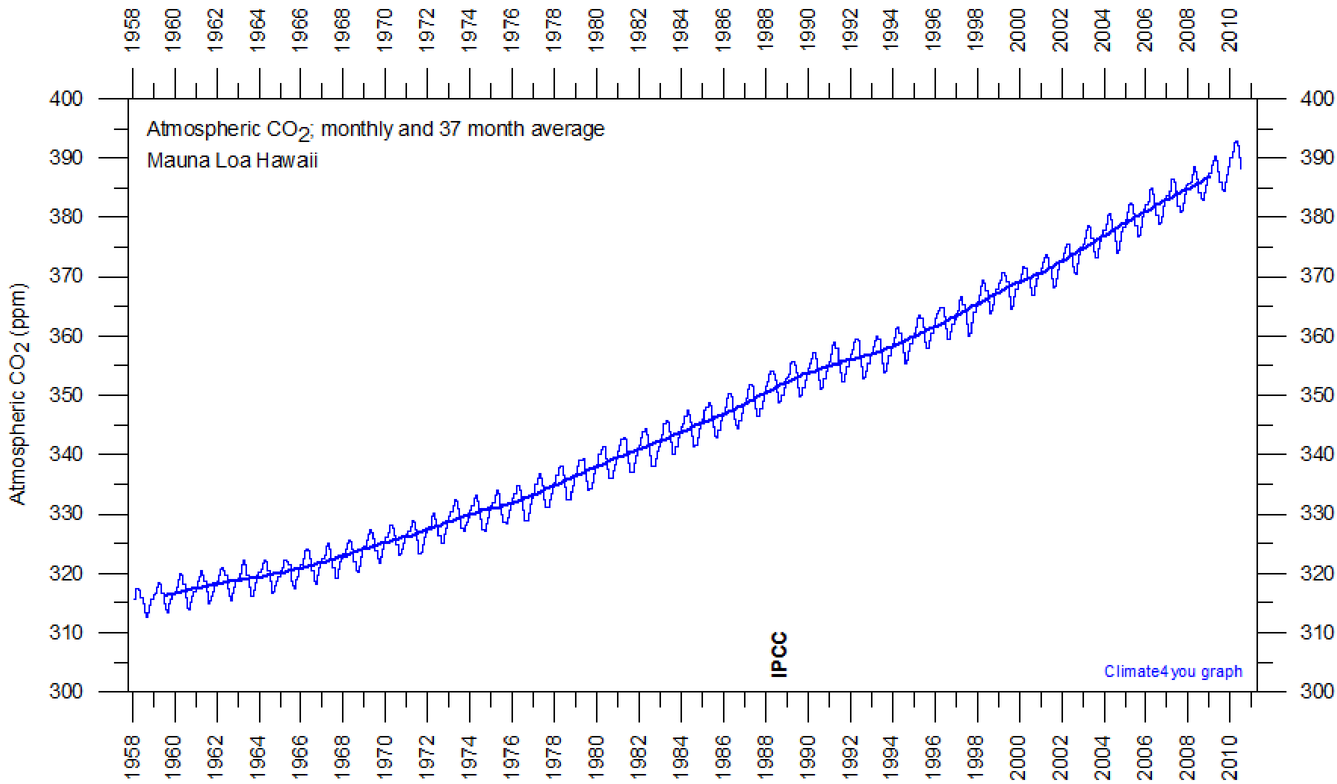
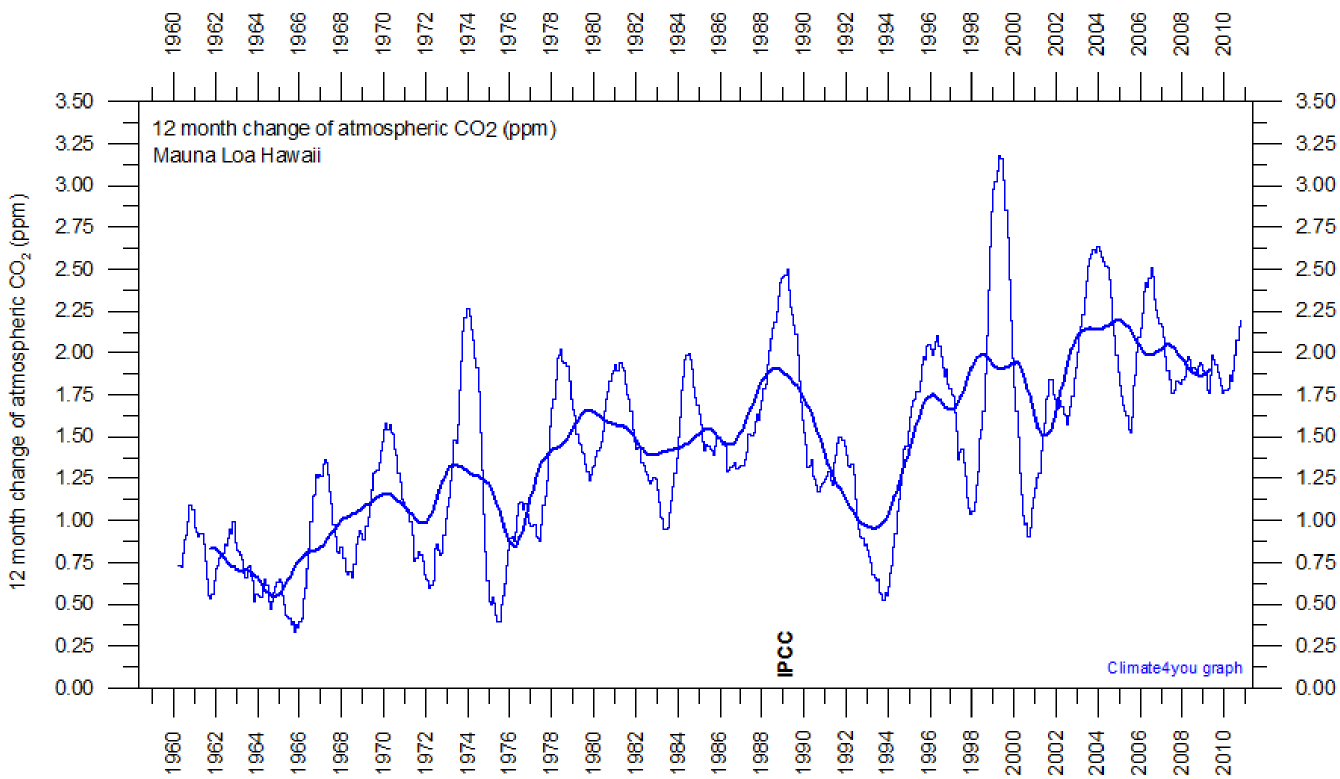


Annual change of global sea level since late 1992 according to the Colorado Center for Astrodynamics Research at [University of Colorado at Boulder](), USA. The thick line is the simple running 3 yr average.

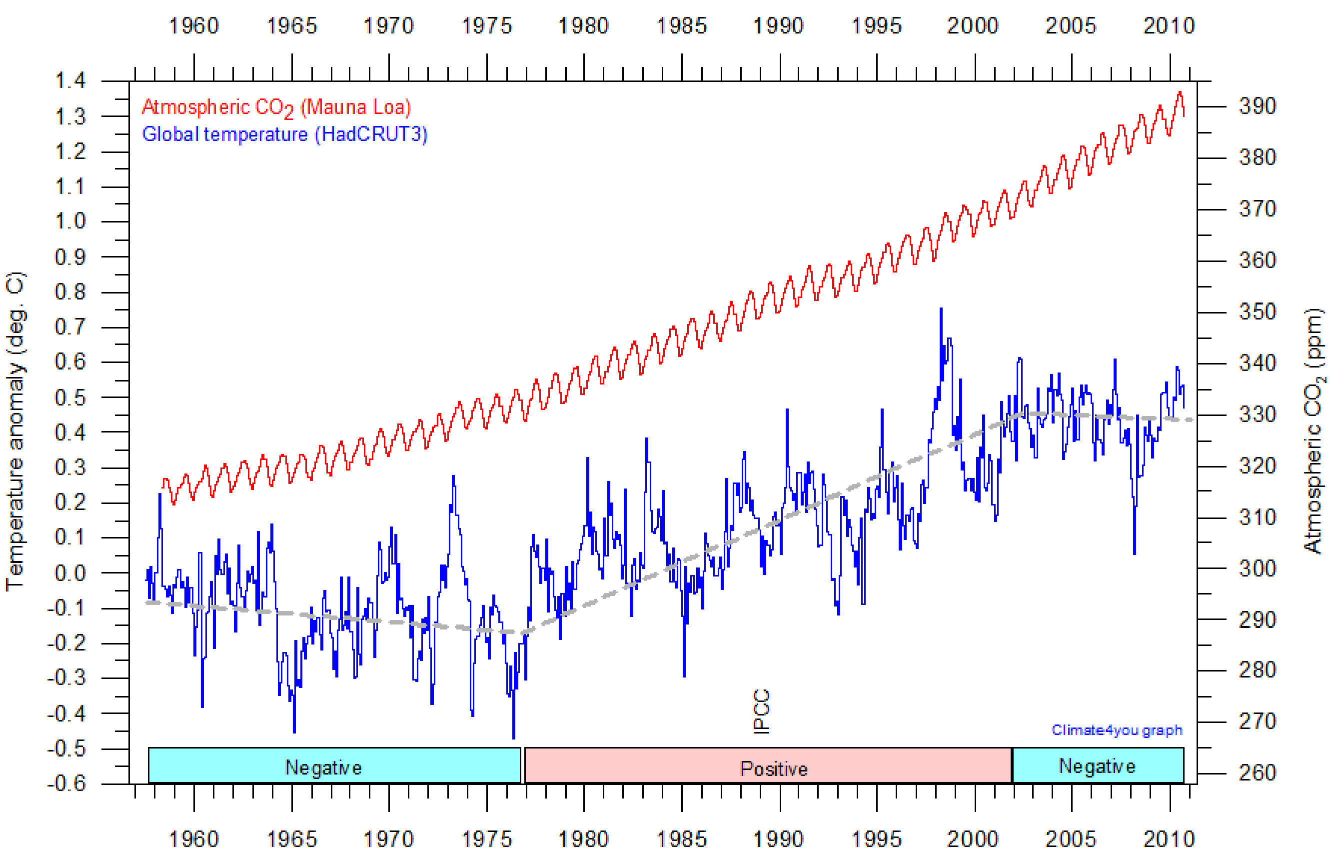
Atmospheric CO_2, updated to August 2010

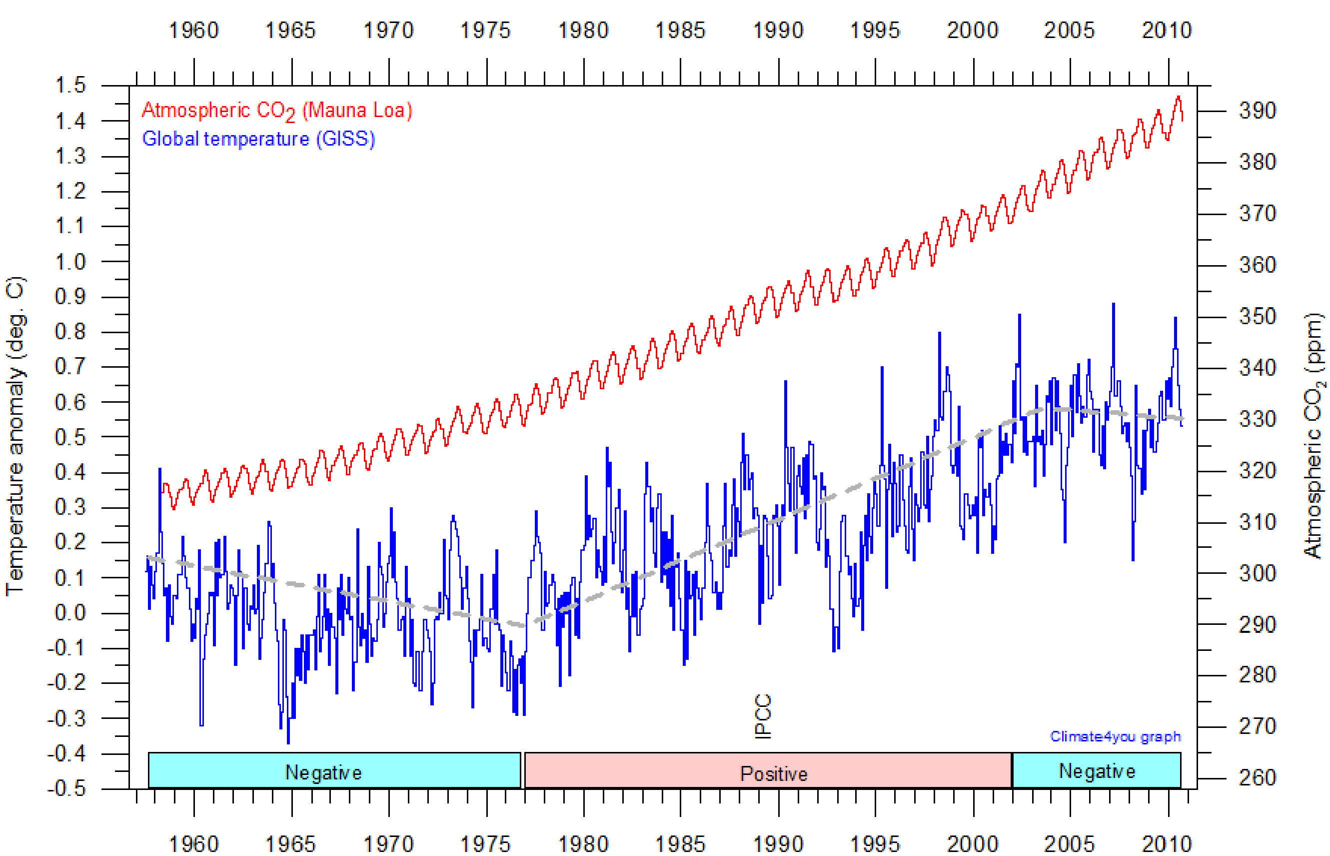


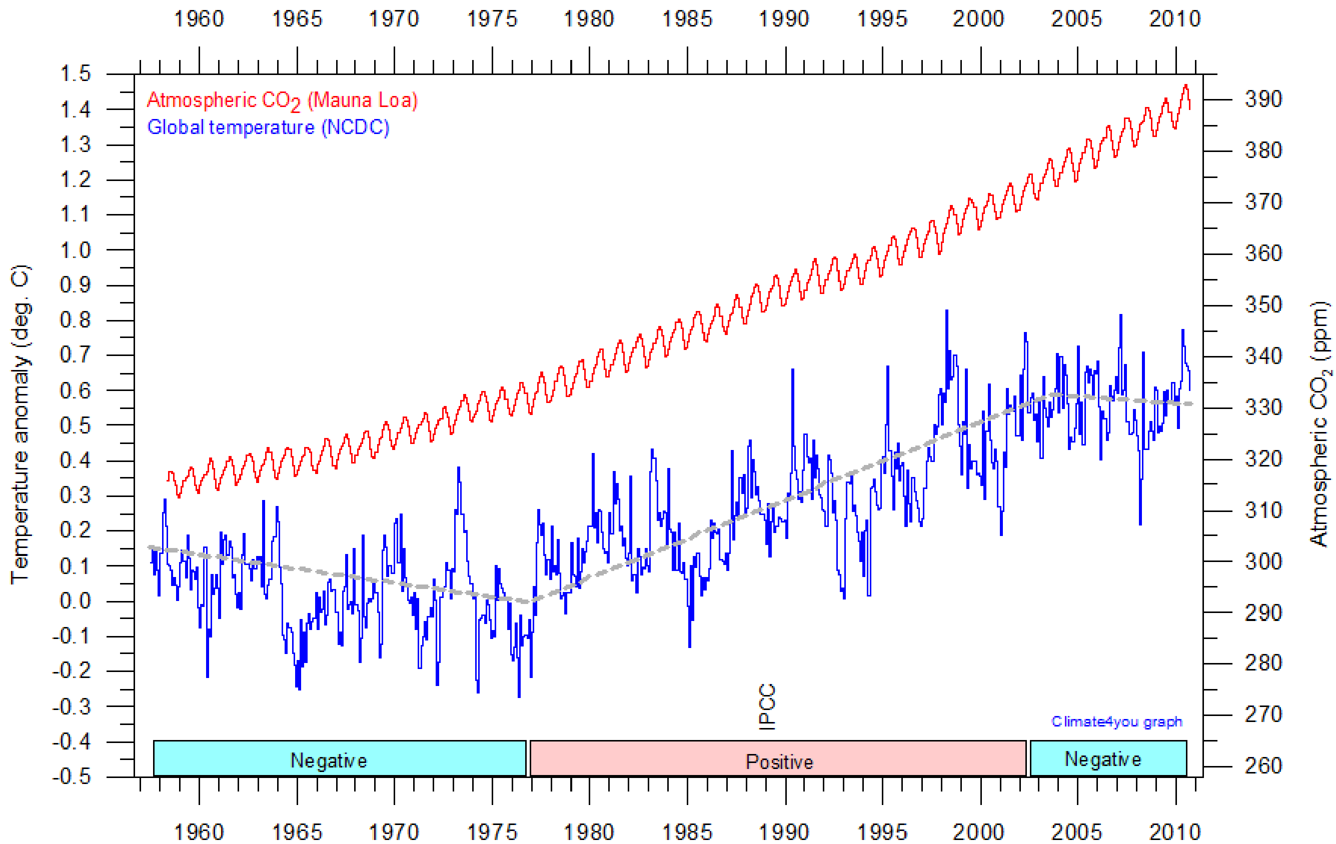


Monthly amount of atmospheric CO_2 (above) and annual growth rate (below; average last 12 months minus average preceding 12 months) of atmospheric CO_2 since 1959, according to data provided by the Mauna Loa Observatory, Hawaii, USA. The thick line is the simple running 37 observation average, nearly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

Global surface air temperature and atmospheric CO_2, updated to August 2010







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. So if the effect of CO_2 is strong, the length of the critical period is short.

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 high importance of CO_2 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

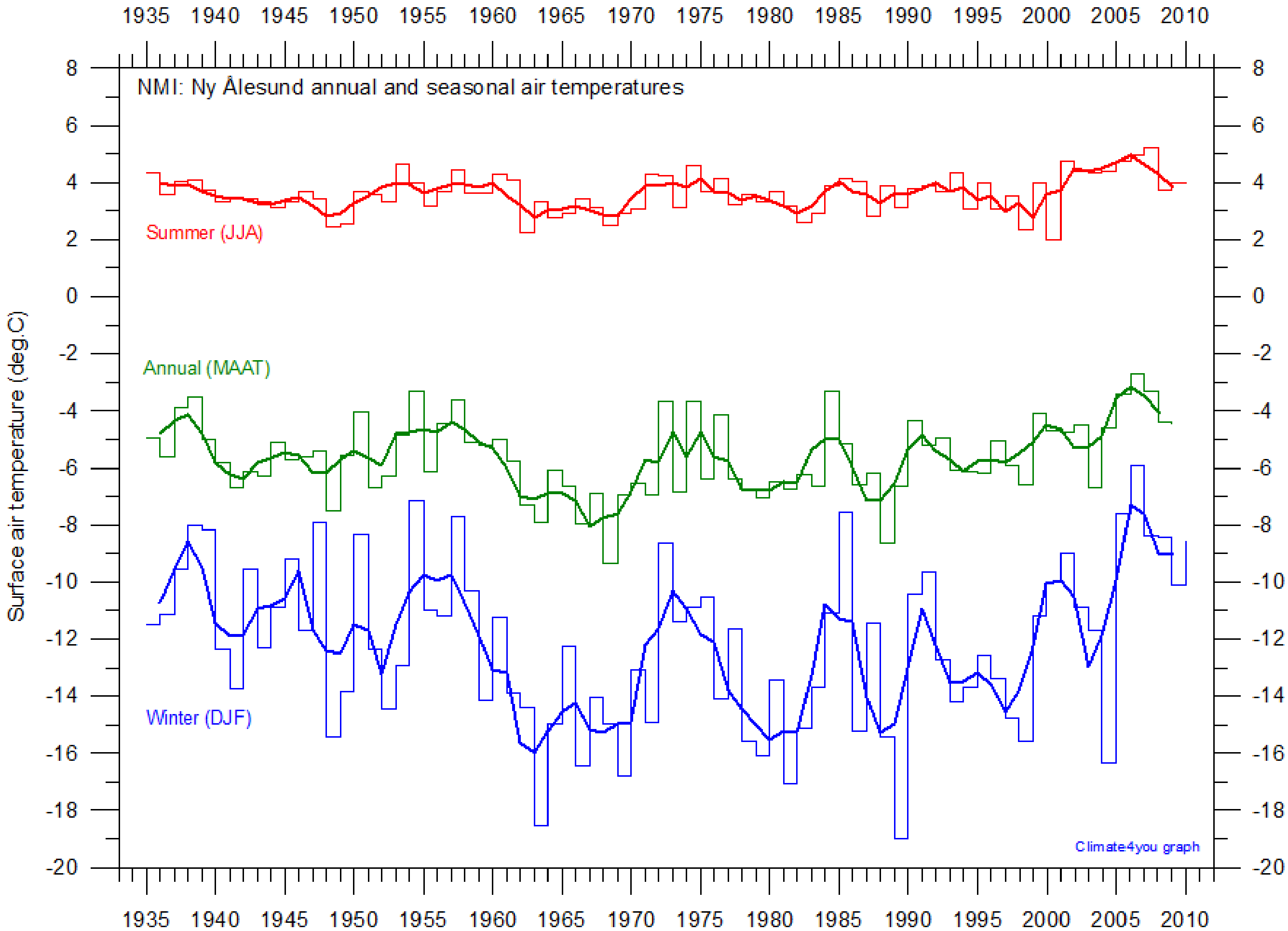
2010: Blomstrandbreen in Svalbard begins new surge advance

Blomstrandbreen seen from SE on 10 August 2010. The central part of the glacier has developed a heavily crevassed surface and the glacier terminus has advanced about 150 m since August 2009.

In August 2002 Greenpeace launched a campain to exemplify how ongoing climate was affecting glaciers world-wide. One of the glaciers which at that time received much attention was Blomstrandbreen in NW Spitsbergen, Svalbard. Although there is little doubt that 20th century climate change since the end of the Little Ice Age in Svalbard have been unfavourable for glaciers in general, it was however pointed out in August 2002 by the present webmaster that Blomstrandbreen was not an optimal choice of glacier to demonstrate climate effects, as this particular glacier (as many glaciers in Svalbard) is a surge-type glacier. Surge type glaciers are characterized by short-lived, often spectacular advances, followed by longer periods of quiescence and retreat. In other words, the coupling between climate and frontal behaviour of such glaciers is complex and not yet fully understood. There are, however, ongoing research projects on Svalbard surge glaciers addressing this interesting research question.

As the surge character of Blomstrandbreen was pointed out in August 2002, an exchange of different opinions resulted, as exemplified by the reference list below. On this background is is interesting to note that Blomstrandbreen now apparently again have begun a new surge advance (see photo above). Presumably this recent advance started already in 2009, and in August 2010 the terminus had advanced about 150 m.

This demonstrates once again how careful one should be by comparing the position of glacier termini, and from this draw conclusions about climate change. While climate since about 1920 (end of the Little Ice Age in Svalbard) certainly has been unfavourable for Svalbard glaciers in general, the beginning decease of air temperatures since 2004-05 recorded at the nearby research facility Ny Ålesund and at Longyearbyen would hardly suffice to explain the recent advance of Blomstrandbreen.



Annual and seasonal surface air temperature at Ny Ålesund, Spitsbergen, since 1935. The summer temperature is especially important for glacier loss of mass (melting, etc.). The data series is to short to demonstrate the warming at the end of the Little Ice Age around 1920, but the cooling since about 1935-40 until about 1980 and the following warming is clearly seen. The graphs are apparently dominated of a series of natural variations. Since about 2005 a renewed temperature decrease dominates. Data source: Norwegian Meteorological Institute.

Thus, in a glacier-climate context, one should compare the climatic development with the results of recurrent investigations on glacier mass balance and the resulting volume changes, and not with the frontal position.

Otherwise, this may often result in misunderstandings and confusion, especially among people without glaciological training.

A list of recent glacier surges in Svalbard can be found at the link below:

www.unis.no/35_staff/staff_webpages/geology/monica_sund/web/new/glacier_surge_sund_unis.htm

References:

Greenpeace 2002. Arctic environment melts before our eyes. 7 August 2002.

Nordlyset 2002. Over breen og inn i banken. Editorial in Norwegian Newspaper 'Nordlyset', 20 August 2002.

Truls Gulowsen, Greenpeace, 2002. Klimaendringer er også menneskeskapt. Nordlyset, 9 September 2002.

Julian Isherwood 2002. Melting glacier 'false alarm'. Telegraph, 17 August 2002.

Humlum, O. 2002. Klima- og gletschergalop på Svalbard. Polarfronten 2002, 03, 13-14.

The Economist and the Greenpeace glacier photo stunt, 20 September 2006.

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)

21 September 2010.