Chapter 6
How is the agitation in the Arctic explained?

A. Can a 'climatic revolution' be analysed?

a) Are the IPCC Reports of any help?

To investigate the early Arctic warming that occurred one hundred years ago, one would presumably get not far if taking a core conclusion of the IPCC serious: *"The Earth's global mean climate is determined by incoming energy from the Sun and by the properties of the Earth and its atmosphere, namely the reflection, absorption and emission of energy within the atmosphere and at the surface"*(IPCC, 2007). Followed from this understanding that IPCC had only little to say about the Arctic "climatic revolution", namely that the *"Average Arctic temperatures increased at almost twice the global average rate in the past 100 years. Arctic temperatures have high decadal variability and a warm period was also observed from 1925 to 1945" (IPCC, 2007).* With such statement the IPCC demonstrates how superficially one of the most striking climatic shifts of the 20th century is handled. Due to the fact that the sun is not and cannot be the direct source of the extraordinary warming during the Arctic winter, this leads inevitable to the prime source of heat supply, the ocean and the seas. With more attention to this very principle polar region condition the IPCC assessments would provide a more reasonable explanation, and presumably lead to the understanding, that "Climate is the continuation of the oceans by other means"[39], whereby 'means' denote: heat and water supply from the ocean and seas to the atmosphere.

b) Is 'Chaos' a hindrance?

One can hear it often: The atmosphere is a chaotic system and as such it is inherently unpredictable. As weather is forced by the heat energy of the sun, the atmosphere is, therefore, unstable and non-linear. These two characteristics are the crucial components of chaos (Palmer 1991). Discussing the chaos of weather in modern science is about climate change projections. Can computer models tell us anything about the mechanism of climate in the future? Definitely not, as long as models cannot handle the past. As indicated by the output from IPCC in the previous paragraph, one of the most decisive climatic events during the last 150 years computer models seems to have not explained anything. Is the work with weather data of little promise to detect the reasons for the early Arctic warming during the winter season? No, the ocean is the dominating source of warming the Arctic during the time the sun is not shining in the Polar region.

One can furthermore hear: Does the chaotic nature of oceanic circulation limit the predictability of climate, just as the chaotic nature of atmospheric circulation is known to limit the predictability of weather?" (Covey, 1991). Indeed, circulation in the oceans and seas is extremely complex and based on many physical characteristics, namely on temperature, salt concentration and density. These conditions create a permanent forcing within the water body of one square-centimetre, a square-kilometre, a regional sea, or the entire global oceans. However, this does not rectify to assume the internal oceanic processes as chaotic in nature.

[39] The climate definition matter is discussed in detail at: http://www.whatisclimate.com/

2007

World Climate Report introduced on the 16th of October 2007 the issue:

Greenland Climate: Now vs. Then, Part I. Temperatures

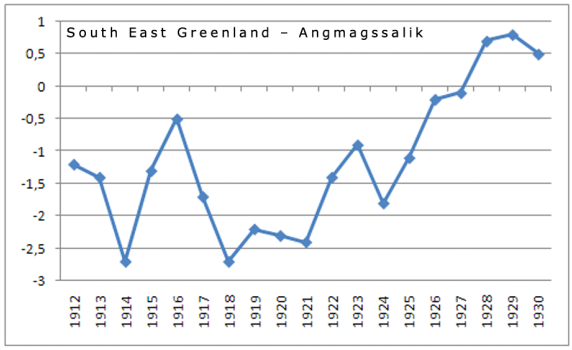
http://www.worldclimatereport.com/index.php/2007/10/16/greenland-climate-now-vs-then-part-itemperatures/

Subject of a Hot Topic at: www.arctic-warming.com, on 18th Oct.2007

This site refers to the early arctic warming at the start of the last Century, which actually was a Spitsbergen warming commencing suddenly in winter 1918/19. Now World Climate Report is willing to demonstrate that Greenland was as warm, or warmer, than it is presently, wondering that this fact seems largely ignored by alarmist scientists. That is good news and may be also of significant assistance to the efforts of this site.

Particularly useful are the given references of Greenland temperature data. The most interesting are from a location at Greenland's East coast named Angmagssallik, which has - according NASA – an air temperature set since 1895. This might help to identify clearly where and when the extreme warming started in the Northern North Atlantic. In Part C, Section: The warming event in detail , this site concluded that the warming commenced in 1918, latest in January 1919.

Annual Mean Temperatures in Celsius before 1920 and after 1920



Around the year 1920 the air temperatures at Angmagssalik (ca. 65° N, 37° W) are fairly steady and only start rising briskly since ca. 1922, almost 2-3 year later than at Spitsbergen in winter 1918/19. AB2008
Data source: http://www.unaami.noaa.gov;

The reproduces winter temperature-set for Angmagssallik, and the corresponding two graphs (for winter and annual mean around the year 1920) show clearly that the warming at East Greenland started one or two year later, as the winter/summer temperatures at Spitsbergen. Attention should be also given to the two graphs showing the minimum and maximum sea ice cover, which usually made Angmagssalik an inland location up to 400 kilometres away from the open sea towards the end of the winter season.

During winter the remote archipelagos Spitsbergen is for short and long-term weather making and changing a unique place. Due to the warm water from the Gulf Current a small section remains sea ice free, and that is the reason why the early warming started in winter and started here. Hopefully World Climate Report continues vigorously by elaborating the warming of Greenland, but is it also able and willing to look across the Greenland Sea to Spitsbergen, considering why it all started there in winter 1918/19.

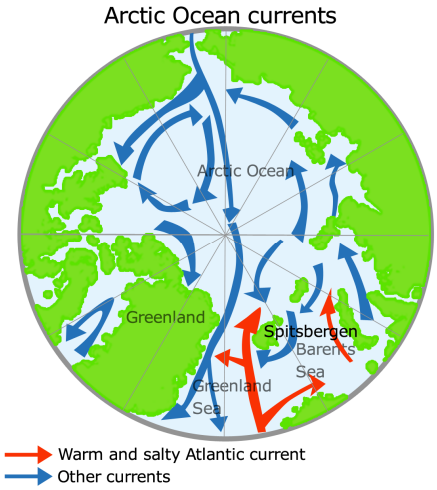
Angmagssalik / East Greenland				
	Jan, Feb March April	Four months	+ Dec.//Year	5 months
1914	-5.1,-12.3,-10.6, -6.8	-34.8/-8,7	-9.3,//1913	-8,8
1915	-7.1,-12.8,-10.0, -4.2,	-34.1/-8,5	-7.3,//1914	-8,3
1916	-6.5, -6.7, -6.5, -5.5,	-25.2/-6.3	-4.7,//1915	-6,0
1917	-2.5, -5.8, -5.5, -3.6,	-17.4/-4,4	,-10.3,//1916	-5,5
1918	-14.8,-13.0, -5.1, -5.1,	-38.0/-9.5	,-13.7,//1917	-10,3
1919	-4.1, -14.9, -8.5, -8.6,	-36.1/-9.0	-6.7,//1918	-8,6
1920	-10.9,-13.0, -8.7, -5.7,	-38.3/-9-6	-6.2,//1919	-8,9
1921	-10.9, -6.2, -7.5, -6.8,	-31.4/-7.9	-8.9,//1920	-8,0
1922	-4.6, -6.7, -5.9, -3.9,	-21.1/-5,3	-6.7,//1921	-5,6
1923	-11.5, -5.9, -1.3, 0.0,	-18.7/-4,7	-3.9,//1922	-4,5

Data info from: http://www.unaami.noaa.gov/analyses/sat/

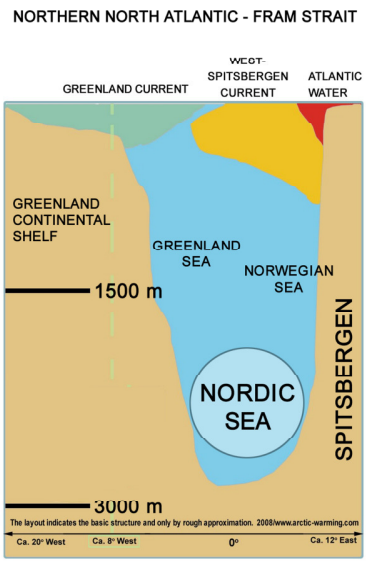
6. How is the agitation in the Arctic explained?

Due to its physical structure, a huge cold water body below a very, very thin warmer sea surface, the oceans are extreme stable over time and space. The mean temperature of less than four degrees Celsius has presumable not changed more than one or two degrees over many 100'000 years.

Over millions of years the ocean structure has ensured that the global mean temperatures have not deviated more than about 10° Celsius from today means. Without the oceans and seas the daily global temperature would cover a range of 300° Celsius. The obvious inability of modelling the ocean processes does not mean that analyzing the event at Spitsbergen is hampered by a chaotic oceanic behaviour. If the modellers had accepted that weather modelling will only be promising if based on a comprehensive set of permanently collected ocean data, they could have explained the warming of the Arctic 90 years ago since long. They should have realized that the term "climate" is not well define as the average weather, but that "climate" should be understood as an immediate result of released heat and water vapour from the oceans and seas, every second, and over all time periods. The best region on earth for such climatic studies is the polar region, and particular if such studies can be based on a unique event as the warming in winter 1918/19.



c) The Arctic, Al Gore and better understanding



Al Gore said in July 2007: "Just in the last few months, new studies have shown that the north pole ice cap – which helps the planet cool itself – is melting nearly three times faster than the most pessimistic computer models predicted"[40]. A few months later, he, together with the IPCC, were honoured with the Peace Nobel Prize in December 2007 for "for their efforts to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that are needed to counteract such change". The awarding Committee was presumably not aware that neither of the two Nobel laureate had hardly anything achieved in explaining why the Arctic warmed the Northern Hemisphere during the first half of the last century. Al Gore had paid the North Pole a visit by submarine before becoming Vice President of the U.S.A: "We were crashing through that ice, surfacing, and I was standing in an eerily beautiful snowscape, windswept, and sparkling white, with the horizon defined by little hummocks, or 'pressure ridges' of ice that are pushed up like tiny mountains ranges when separate sheets collide. But here too, CO2 levels are rising just as rapidly, …As the polar air warms, the ice here will thin; and since the polar cap plays

[40] The New York Times (2007); Al Gore, "Moving Beyond Kyoto", Sunday, the 1st of July 2007, WK 13.

Source: www.arctic-heats-up.com; The Arctic Warming 1919 to 1939; by: Arnd Bernaerts

such a crucial role in the world's weather system, the consequences of a thinning cap could be disastrous" (Al Gore, 1992).

Al Gore's North Pole visit took place about 1990. As almost two decades have passed, one can only wonder that he and his fellow alerter on global and arctic warming still understand so little about at least the early part of the warming in the Arctic. Instead he claimed recently:

- "We – the human species – have arrived at a moment of decision."
- "What is at risk of being destroyed is not our planet itself, but the conditions that have made it hospitable for human beings".
- "We – all of us – now face a universal threat. Though it is not from outside this world, it is nevertheless cosmic in scale." (NYT, 1 July 2007).

How can someone talk about a cosmic scale threat if he is not able and obviously not interested in understanding a 'climatic revolution' that occurred under the eyes of modern science only 90 years ago? The explanation is presumably simple. Whoever is talking about climate without thinking comprehensively in the terms conditioned by the oceans and seas, will get not far in understanding what makes climate tick and where and when human activities are changing climate due to altering the 'natural structure and course' of the oceans and seas.

d) Any analysis is to be based on ocean impact

The question, whether the early Arctic warming can be analysed, intended to stress the ocean issue. No doubt, the impression that the oceans play an important role in weather and climate matters is widely spread, particularly among the average laymen. But when it comes to thinking in oceanic matters comprehensively, science is handling the questions fragmented and in a piecemeal manner. In this way one quickly misses the point. For example back in 1991 a paper asserted that "changes in the intensity of the thermocline circulation, and hence its poleward heat transport, would have a significant effect on global climate" (Weaver, 1991). Who if not this heat transport is the most likely source of the "climatic revolution" in the Arctic before the 1940s. But neither IPCC, nor the scientists working with models and chaos theories, and also not Al Gore, seem to be able to consider the warming of the Arctic from an oceanic perspective.

Even leading Arctic research experts seem to have to go some way to put more focus on the sea areas surrounding the North Pole. They will have difficulties to explain the present situation as long as they cannot explain what had happened in the past. The following section provides a selection of recent findings concerning the warming 90 years ago, with the emphasis on the 'presentation' of the early warming, whether the ocean issue is addressed, and which explanations are given. In the subsequent chapter the main aspect of the early Arctic warming and its causation will be discussed.

B. Recent findings in Arctic research

The following excerpts are selective and do not necessarily present only individual results of the authors but may include quoted conclusion. However, the selection intents to provide a principle picture on whether the authors are aware of the big warming at Spitsbergen since winter 1918/19, respectively the Arctic warming, and how it is presented. For subsequent work the interested reader is advised to consult the original texts.

Source: www.arctic-heats-up.com; The Arctic Warming 1919 to 1939; by: Arnd Bernaerts

Overpeck, et al., 1997

From 1840 to the mid-20th century, the Arctic warmed to the highest temperatures in four centuries. This warming ended the Little Ice Age in the Arctic and has caused retreats of glaciers, melting of permafrost and sea ice, and alteration of terrestrial and lake ecosystems. Although warming, particularly after 1920, was likely caused by increases in atmospheric trace gases, the initiation of the warming in the mid-19th century suggests that increased solar irradiance, decreased volcanic activity, and feedbacks internal to the climate system played roles.

Jones, et al., 1999

The Northern Hemisphere warmed between about 1880 and 1940, and cooled after 1940.

The global surface air temperature (SAT) has increased with 0.6 ° C since 1861, with a slightly higher rate of warming in the twentieth century.

Kelly, et al., 1999

Trends in Arctic temperatures have been broadly similar to those for the Northern Hemisphere during the study period. The Arctic variations were, however, greater in magnitude and more rapid.

The overall range of the long-term variations in the temperature of the Arctic has been greater in winter.

In the winter record, the 1910s rather than the 1880s was the coldest decade. 1917 and 1918 were notably cold years especially in the winter records. The 1910s was the coldest decade in winter.

The annual data show a drop of 0.45°C from the previous decade. During the final years of this decade, warming began in the Barents Sea and Kara Sea regions.

The 1920s was a transitional decade with strong warming affecting most regions. The Barents and Kara Seas had warmed by about 2°C annually.

Polyakov, et al., 2003

The higher temperatures in the Arctic, during the 1930s–40s and the recent decades, and the lower temperatures, during the 1960s–70s and prior to the 1920s may be associated, at least partly, with the positive and negative phases of the LFO (low-frequency oscillation).

The seasonal differences in the alternate warming periods (1920s–30s and from the 1980s to the present) and cooling period (1940s–50s) are striking.

The warming during the 1920s–30s was very fast in spring, autumn and winter, but much weaker and slower in the summer. The period between 1918 and 1922 displays exceptionally rapid winter warming.

Source: www.arctic-heats-up.com; The Arctic Warming 1919 to 1939; by: Arnd Bernaerts

6. How is the agitation in the Arctic explained?

The rapid autumnal temperature rise, in the 1930s, was a local phenomenon that was observed only in Scandinavia and in the western part of maritime Russia.

This variability appears to originate in the North Atlantic and is likely induced by slow changes in oceanic thermohaline circulation.

However, SAT records demonstrate multi-decadal variability, which is stronger in the polar region than at lower latitudes. This may suggest that the origin of this variability may lie in the complex interactions between the Arctic and North Atlantic.

The Arctic temperature was higher in the 1930s–40s than during the recent decades, and hence a trend calculated for the period beginning with 1920 and going up to the present actually shows a cooling trend.

The complicated nature of Arctic temperature and pressure variations determines the difficulty of understanding the causes of the variability, and of evaluating the anthropogenic warming effect.

Polyakov, et al., (2004)

The Arctic surface air temperatures were highest in the 1930s – early 1940s.

The normalized AWCT (Atlantic Water Core Temperature) shows warm periods from late 1920s to 1950s.

Bengtsson, et al., 2004

The huge warming of the Arctic, which started in the early 1920s and lasted for almost two decades, is one of the most spectacular climate events of the 20th century.

The Arctic warming from 1920-1940 is one of the most puzzling climatic anomalies of the 20th century.

During the peak period of 1930-1940, the annually averaged temperature anomaly from the area 60°N-90°N amounted to around 1.7°C.

Whether this event is an example of an internal climate mode or of an externally induced phenomenon (by enhanced solar effects) is presently under debate.

Here we suggest that natural variability is the most likely cause, reduced sea ice-cover being crucial for the warming.

This warming was associated and presumably initiated by a major increase in the westerly and south-westerly wind, north of Norway, this leading to an enhanced atmospheric and ocean heat transport from the warm North Atlantic Current, through the passage between northern Norway and Spitsbergen, into the Barents Sea.

We suggest that the warm Arctic event just happened by chance, through an aggregation of several consecutive winters with pronounced, high latitude westerly in the Atlantic sector.

Source: www.arctic-heats-up.com; The Arctic Warming 1919 to 1939; by: Arnd Bernaerts

6. How is the agitation in the Arctic explained?

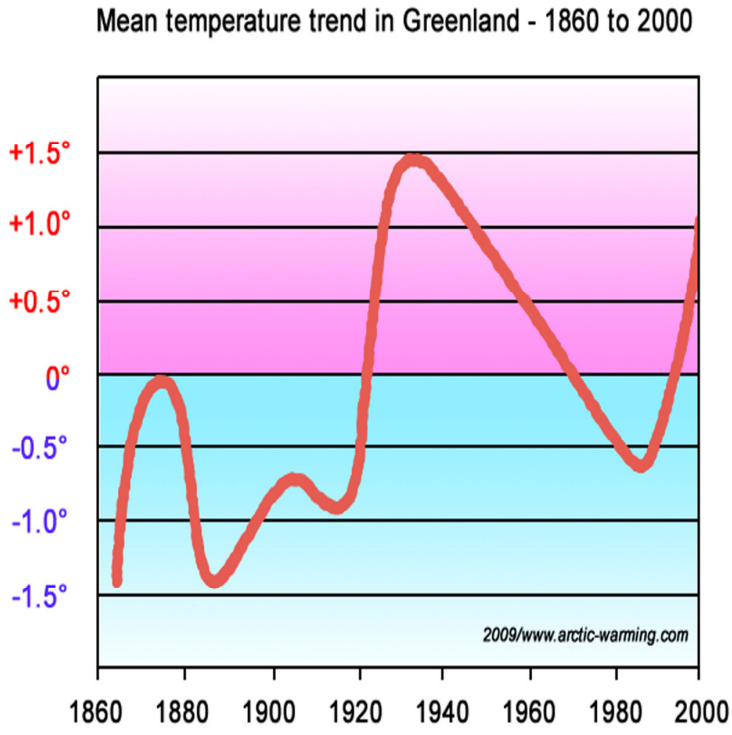
It is interesting to note that the increasing high latitude at which westerly usually flow wasn't related, this time, to the North Atlantic Oscillation, which was simultaneously weakening.

What consequences may have the findings of this study for the possible evolution of the Arctic climate? Notwithstanding an expected overall climate warming, it is suggested that the Arctic climate would be exposed to considerable internal variations during several years, initiated by stochastic variations of the high latitude atmospheric circulation and subsequently enhanced and maintained by sea ice feedback.

Johannessen, et al., 2004

SAT (surface air temperature) observations and model simulations indicate that the nature of the arctic warming in the last two decades is distinct from the early twentieth-century warm period. It is strongly suggested that the earlier warming was natural internal climate-system variability, whereas the recent SAT changes are a response to anthropogenic forcing.

Two characteristic warming events stand out, the first from the mid 1920s to about 1940 and the second starting in 1980 and still ongoing.



The early twentieth-century warming was largely confined to north of 60N.

Both the 1920–39 and 1980–99 warming phenomena are more pronounced during winter for the high Arctic.

The anthropogenic forcing in the 1920s–1930s was by far too weak to generate the observed warming – the change.

The GHG (green-house-gas) forcing in the early decades of the twentieth century was only 20% of the present.

We theorize that the Arctic warming in the 1920s/1930s and the subsequent cooling until about 1970 are due to natural fluctuations internal to the climate system.

Source: www.arctic-heats-up.com; The Arctic Warming 1919 to 1939; by: Arnd Bernaerts

Serreze, 2006

Since the mid-1800s, global average surface air temperature has risen approximately 0.7°C. It is widely believed that at least part of this warming arises from increased concentrations of infrared absorbing gases in the atmosphere, the so-called greenhouse effect.

Substantial high-latitude warming from about 1920 to 1940 was followed by cooling until about 1970.

A trend calculated from 1920 to present, however, yields a small Arctic cooling. Over the period 1901 to 1997, the difference in the Northern Hemisphere trend and that for the Arctic is statistically insignificant.

It nevertheless seems clear that the warming in recent decades, the warming in the earlier part of the 20th century, as well as the cooling between them are more pronounced in high latitudes than the Northern Hemisphere as a whole.

The earlier warming has no summer signalled at all, and exhibits a strong latitude dependency. In summary, we conclude that:

> (1) In sharp contrast to the high-latitude warming in the earlier part of the 20th century, the recent warming is part of a global signal, suggestive of external forcing;
>
> (2) Arctic amplification of this SAT signal, as well the observed decline in the sea ice cover, has been strongly influenced by low-frequency climate variability, especially that associated with the NAM and PDO[41];
>
> (3) The NAM and PDO cannot neatly explain all of the changes.

Overland, 2006

What is the comparison of recent decades with earlier warm periods in the Arctic such as the 1920s –1940s.

It should be noted that the Arctic north of 66°N represents a small fraction of the globe and that it lies at the northern limit of major storm tracks; thus Arctic is subject to considerable seasonal to decadal atmospheric variability or 'climate noise'.

The Arctic also includes major feedback processes. The most important is albedo feedback where loss of snow or ice increases the absorption of solar radiation by land or ocean. A second one is cloud – radioactive feedback where increase open water creates increased moisture flux to the atmosphere, this creating more clouds and a shift in radiation balance.

The Arctic is also influenced by external forcing from volcanoes, changes in solar activity, and anthropogenic sources.

[41] Northern Annular Mode (NAM) and Pacific Decadal Oscillation (PDO).

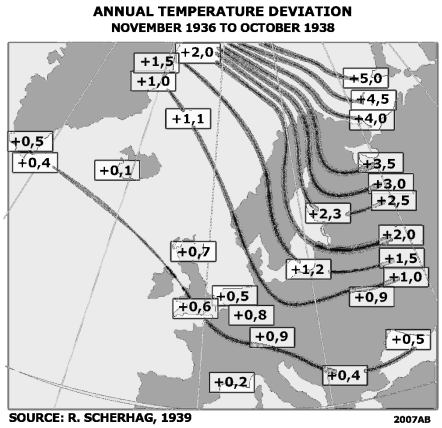
Source: www.arctic-heats-up.com; The Arctic Warming 1919 to 1939; by: Arnd Bernaerts

2009

„A Focus on Climate During the Past 100 Years"

by S. Brönnimann et al. (ed); 2008
Brönnimann; Luterbacher, J.; Ewen, T.; Diaz, H.F.; Stolarski, R.S.; Neu, U. (Eds.) 2009, XVI, p. 364;

A comment to the editor's "Introductory Paper" at http://www.1ocean-1climate.com, 27. Dec. 2009 (Extract; graphs & reference not shown)



The 'Introductory Paper' is fair in acknowledging that there are many open questions, but has little proof to offer if it claims that the past 100 years are significant for "the changeover of a climate system dominated by natural forcing to a climate system dominated by anthropogenic influences". The paper presents the matter as fact which is elsewhere formulated as question: "Was the 1910–1945 trend a result of "natural variability" and the 1950–2003 trend an "anthropogenic" warming?" (p.9). The paper says also that the introduction gives an overview of the book in the context of recent research, highlighting some of the key findings and concepts (p.2), but rarely does. Instead a mingle-mangle of other findings is presented with little, if any, critical review.

For example:

INTRODUCTION p.2: During the past 100 years the Arctic experienced two pronounced warming periods. Between 1915 and 1945, annual mean temperatures increased by about 1.8°C. This period was followed by a cooling and a more recent warming, which started around 1970 and is still ongoing.

COMMENT A:

___Any assessment of the recent climate should acknowledge that a global warming trend had started at the end of the Little Ice Age around 1850, because the two pronounced warming periods mentioned could be part of one warming-up since 1850, interrupted by a three decade cooling phase (1940-1970). By global warfare?

___The sudden increase of temperatures started in winter 1918/19 and not 1915.

___The warming was initially not global, but had an impact in the USA until about 1933.

___The warming did not last until 1945 but ended with three extreme Northern Europe winters immediately after World War II commenced.

INTRODUCTION p.8/9: The 1910–1945 (warming) trend was most pronounced over the Atlantic and North America, while Europe experienced a winter cooling. In contrast, the 1950–2003 period exhibited a strong winter warming of the northern hemispheric land masses. What may have caused this difference in climatic response?

COMMENT B:

___The here reproduced graphic for the time period Nov.1936 to Oct.1938 indicates the trend was quite different as claimed by Brönnimann.

___The period between 1940 and 1970 was strongly influenced by a global cooling.

___And is there a difference in climatic response? Yes & No!

___YES: The early warming had been caused by the West Spitsbergen Current, while the second warming was actually marking the end of the interrupted warming trend from 1940 to 1970s presumably partly due to the naval warfare during WWII.

___NO: Because the discussed changes had been generated and controlled by the oceans and seas.

At present all three factors can be considered 'causes' of Arctic climate: natural variability, internal feedbacks, and external forcing, but with unknown relative importance and interaction.

The earlier warming shows large region-to-region, month-to-month, and year-to-year variability suggesting that these composite temperature anomalies are due primarily to natural variability in weather systems.

Overland, 2008

A meridional pattern was also seen in the late 1930s with anomalous winter (DJFM) SAT, at Spitsbergen, of greater than +4°C. Both periods suggest natural atmospheric advective contributions to the hot spots with regional loss of sea ice.

C. The issues debated by Arctic science

a) The ignorance of older research

Did the scientific disciplines of meteorology and climate come in being only few decades ago? The work of modern scientists in the field of Arctic research seems to confirm the question. None of the mentioned papers has analysed the considerable work of their forefathers. Their long list of used references rarely uses research work older than 10 years. Prominent names in meteorology from the 1930s, like Birkeland, Brooks, Scherhag, Schokalsky, Manley, Carruthers, etc. are seldom mentioned, and if so, only randomly. None of their interesting work is analysed, evaluated, or discussed. The extraordinary temperature rise at Spitsbergen, the date, the extent, the duration at this station and in the wider region have neither been emphasised nor elaborated. The extremely important distinction of summer and winter temperature in this region was never made to a core issue for research work, nor is the extensive sea ice cover from Kap Farwell/South Greenland, Iceland, and Bear Island in late spring made a discussion point.

It seems that modern science believes that the world of Arctic climatology had to be newly created somewhat 30 to 40 years ago. But even if they thought that their discipline would need to be newly invented, it would nevertheless have been necessary to prove the case by demonstrating that the research work of the 1930s and 1940s had been superficial, wrong, incompetent, and useless. But simply ignoring the work is too little to do serious research on understanding how the Arctic climate is ticking.

But even more fundamental aspects were ignored, respectively not seen. One of the most astonishing examples is the indifference of many research work shown when it comes to the marked difference between summer and winter temperatures. Although a number of papers acknowledge that there has been a marked higher temperature winter level versus the summer level, this issue was never picked up for thorough investigation. Although arctic winter warming cannot be directly enhanced by a solar effect, Overland and others do not question nor even hesitate to bring solar activities in play.

The superficiality is topped by a complete ignorance of seasonal air temperatures of Arctic coastal or inland stations in relation to the status of sea ice relevant at that location. At most general freezing and melting aspects are mentioned, but the extreme weather and climate relevant seasonal icing in the Northern North Atlantic and Barents Sea has not been elaborated in any of the papers mentioned above. One paper, for example, merely mentions that "reduced sea ice-cover being crucial for warming". No wonder that the

Source: www.arctic-heats-up.com; The Arctic Warming 1919 to 1939; by: Arnd Bernaerts

researchers missed to elaborate and to explain the special situation of Spitsbergen throughout the 150 years since the end of the Little Ice Age, but particularly the early warming of 90 years ago, and the subsequent warming since the 1980s.

The astonishment is enhanced by the fact that some researches have no problem to acknowledge that the warming since the 1920s:

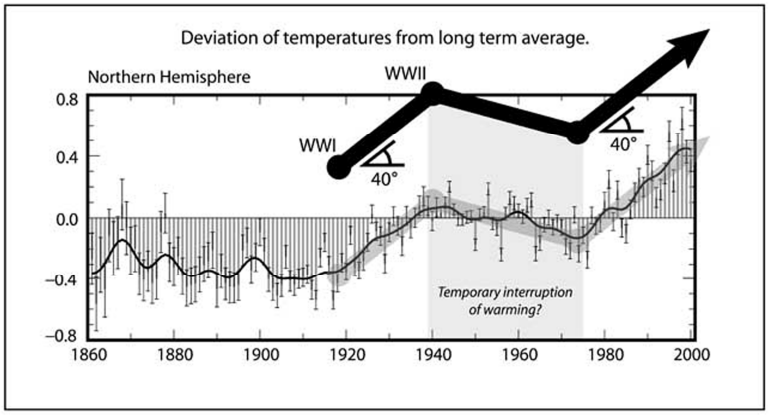
- was greater in magnitude and more rapid, than the recent one;
- displays exceptional rapid winter warming;
- the seasonal differences are striking;
- has no summer signal at all;
- is one of the most spectacular climate events;
- is one of the most puzzling climatic anomalies,

but do not rest until finding an answer to each of the raised points.

Based on those initial general remarks, some further 'explanation' given in the referred paper will be picked up and discussed.

b) About the suddenness of the early event

None of the papers recognises or investigates the most remarkable feature of the early warming, namely the suddenness. The suddenness, which we could pin-point as having happened –statistically- in January to February 1919, is the source of information that ticker question and cry for answers. At a remote archipelagos as Spitsbergen a sudden warming during winter would inevitably leave only few options for the identification of the causation. It seems impossible to come up with something else than the ocean body. But even that would need to be qualified more precisely, as a sea body like the Norwegian Sea itself would presumably never be able to produce such a big warming suddenly and to sustain it over two decades. The warm Atlantic water travelling toward the North Pole with the Spitsbergen Current would have quickly caught attention. The research of Arctic warming could commence.



For example: One researcher asserts that “this variability may lie in complex interactions between Arctic and North Atlantic”. But the logic would have told one that the more interaction had happen, the less likely it would have allowed happening with suddenness.

Another example is certainly the frequent reference to “natural variability”. One can not base a research merrily on longer period statistics without evaluating the statistics on lower frequencies as well. Any detailed analysis of the rise of winter temperatures at Spitsbergen shows that the jump was not natural, but “unnatural”.

c) Circulation variations – Brooks Question 1938

One paper suggested that the Arctic climate would be exposed to considerable internal variations during several years, initiated by stochastic variations of the high latitude atmospheric circulation and subsequently enhanced and maintained by sea ice feedback. No word on what caused the alleged circulation variations. No word on what essential conclusion can be drawn. A stochastic process is one wherein the system incorporates an element of randomness as opposed to a deterministic system.

Other researcher said that the temperature variations might be due to: “at least partly, with the positive and negative phases of the low-frequency oscillation (LFO)”. LFO means to vary between alternating extremes, usually within a definable period of time. Such notion explains not the suddenness, nor the magnitude, and neither the long duration over two decades. The notion does not lead to the location Spitsbergen, does not put the emphasis on Northern North Atlantic as the determining factor, and miss the point that this warming could have only be initiated and sustained by the West Spitsbergen Current.

The problem is not new but haunted already the researchers in the 1930s. What had caused the warming of the Arctic? R. Scherhag, presumably one of the most keen and competent researcher on the issue, was one of the few who came up with at least one assertion, which the American meteorologist C.E.P. Brooks, immediately questioned. In 1937 R. Scherhag wrote:

> *“The greater mildness of winters observable in the temperate zone during the last hundred years, accompanied by an increase in atmospheric circulation, has, during the last fifteen years, led to an extraordinary rise in temperature in the arctic regions, which in its turn has been accompanied by a corresponding retreat if the ice and a higher temperature in the sea. (Scherhag, 1937)*

In 1938 Brooks asked the right question, which neither Scherhag, nor modern science has answered yet:

> *“Attributing the recent period of warm winters to an increase in the strength of the atmospheric circulation only pushes the problem one stage further back, for we should still have to account for the change of circulation.” (Brooks, 1938)*

Indeed! Since long such question concerning circulation changes and variation should not have been placed as presumptions, as mentioned in the previous paragraphs, but answered.

Brooks question is also not answered if, for example, one paper names instead the changed circulation a major increase in the westerly and south-westerly wind, north of Norway, and thereon coming up with the

2007

Andrew C. Revkin, The New York Times, on 2nd of October 2007,

"Arctic Melt Unnerves the Experts"

http://www.nytimes.com/2007/10/02/science/earth/02arct.html



The stark shrinking of the Arctic ice cap during summer 2007 was the article's concern, expressing –inter alias – the following:

___Over all, the floating ice dwindling to an extent unparallel in a century or more, by several estimates.

___One geologist summarized it in this way: "Our stock in trade seems be going away."

___Scientists are also unnerved by the summer's implications for the future, and their ability to predict it.

___Still, many of those scientists said they were becoming convinced that the system is heading towards a new, more watery state, and that human-caused global warming is playing a significant role.

___Other important factors were warm winds flowing from Serbia around a high-pressure system parked over the ocean.

A HOT TOPIC at www.arctic-warming.com,
on 26th October 2007 commented as it follows:

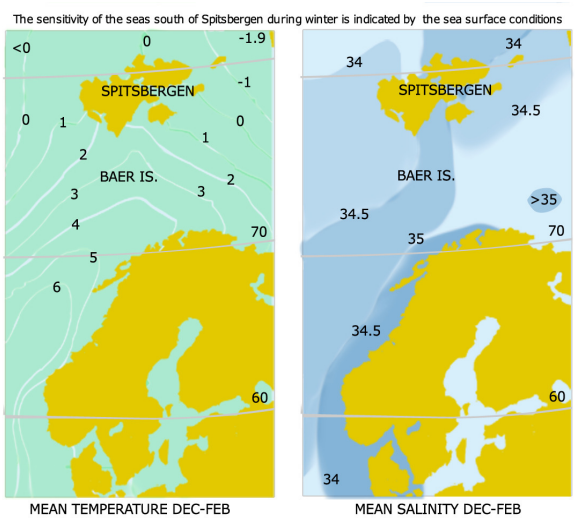
Recently the NYT journalist Andrew C. Revkin has elaborated the rapid decline of Arctic sea ice and found that the "Arctic Melt Unnerves the Experts". That needn't to be if more attention had been given to the extreme Arctic warming phase for two decades during the first half of the last Century.

Only few days ago WCR discussed the "Greenland Climate: Now vs. Then, Part I. Temperatures" (Subject to a 'Special Page' at this Chapter 6), before World War II because the island had been warm, presumably even warmer, than it is presently, wondering "that this fact seems largely ignored by alarmist scientists". The article demonstrates that within a few years in the early 1920s, the typical average temperature rose by about 2ºC. This is an important finding, but "peanuts" in comparison to the warming of Spitsbergen.

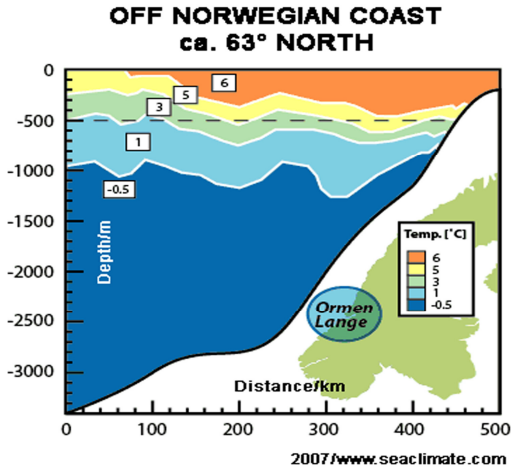
The even more important question may be in which region the warming actually started and when. On one hand one needs warm water that the Golf Currents supply to the West coast of Spitsbergen, on the other hand one needs to take into account the prevailing sea-ice conditions from December to April, as shown in a graphic. Actually, the East coast of Greenland is largely cut off from the open sea during the winter season, while in the West of Spitsbergen the sea remains ice free high into the North. The brisk warming trend only started after the year 1920, while the warming at Spitsbergen to the year 1918, latest to Januarys 1919.

By now one can only hope that the early Arctic warming receives further attention, as the climate debate should be based on understanding why the Arctic climate changed suddenly only 90 years ago. It is not enough just to claim that it happened in due natural course, as WCR did on the 22nd of October 22 2007 when discussing Andrew C. Revkin article.

assumption that this lead to "an enhanced atmospheric and ocean heat transport from the warm North Atlantic Current, through the passage between northern Norway and Spitsbergen, into the Barents Sea" (Bengtsson, 2004). Presumably, the authors want to say what also Brooks expressed in 1938, when he wanted to explain his statement on accounting for a change of circulation:



"Moreover, it is almost equally plausible to regard the change of circulation as a result of the warming of the Arctic, for open ice conditions in the Arctic Ocean are favourable to the formation of depressions. More probably the increased circulation is both cause and effect of the warmed Arctic; high temperature causes storminess and decrease of pressure in high latitudes, which in turn is associated with stronger wet winds in middle latitudes, driving an excess of warm sea water into the Arctic and raising the temperature still further."(Brooks, 1938)



Although Brooks was already on the right way, he seems himself aware that this is not the needed explanation on what caused the circulation to change in the first place. The cited recent paper has hardly more to offer as Brooks before 70 years. At least Brooks conclusions is presented in general terms, while the recent paper name the Barents Sea without any elaboration whether this fairly shallow sea, with an average depth of 230m, can initiate a very sudden warming, and sustain a warming of a longer period of time. This issue will be discussed more deeply in the next chapter.

d) The non sensual use of "natural variability"

Almost all papers relate the early warming in the 1920s partly or primarily to:

- natural variability in the weather system;
- atmospheric variability or "climate noise";
- natural fluctuations internal to the climate system;
- considerable internal variations;
- feedbacks internal to the climate system.

These references explain nothing. Nowadays WMO[42] still defines climate as the average weather, while the global convention, on this matters has not a definition of climate at all[43]. Instead the "climate system" is defined as: "the totality of the atmosphere, hydrosphere, biosphere and geosphere and their interactions". This does not paraphrase more than "global nature". Raising the matter here shall indicate the use of such term, or equivalent circumscriptions, does in no way contribute to explain anything of the situation in the Arctic since the late 1910s. The researchers in the 1930s seem to have had a more solid approach in mind, as none of them – as far as it could be observed – has ever assumed that this warming is due to "natural variability"|. More information on the term "climate" is available at a specialized web-site[44].

D. Summary

The question was, whether modern science is able to provide reasonable explanations on the reasons for the Arctic warming. This is definitely not the case for the warming that occurred 90 years ago. The assessments and conclusions remain superficial and hypothetic. The current arctic warming can presumably only reasonably be understood and explained by a thorough understanding of the warm and cold periods of the last century. It surprises that the sudden warming of the Arctic, although widely acknowledged, has never been seen as the presumably best study field, under the most promising circumstances, to reach evident results. Instead the matter is side stepped and made scientifically irrelevant by claiming that there is nothing to investigate due to the fact that it happed as a natural fluctuation. The next chapter shall show that this is not a sustainable approach, but that it is possible to prove that the causation can be named.

[42] World Meteorology Organisation

[43] United Nations Framework Convention on Climate Change, 1992; but defines instead in Article 1 the following terms:

1. "Adverse effects of climate change" means changes in the physical environment or biota resulting from climate change which have significant deleterious effects on the composition, resilience or productivity of natural and managed ecosystems or on the operation of socio-economic systems or on human health and welfare.
2. "Climate change" means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.
3. "Climate system" means the totality of the atmosphere, hydrosphere, biosphere and geosphere and their interactions.

[44] http://www.whatisclimate.com/

Source: www.arctic-heats-up.com; The Arctic Warming 1919 to 1939; by: Arnd Bernaerts

2008

Catherine Brahic on:

Arctic currents may be warming the world

In: New Scientist -26 April 2008, Magazine issue 2653, p. 12
http://www.newscientist.com/article/mg19826533.900-arctic-currents-may-be-warming-the-world.html



The article by Catherine Brahic demonstrates that there is substantial awareness of an oceanic impact on global warming. Not only ocean currents but Arctic currents may be warming the world. That sounds interesting, but only on first view. Some excerpts form the article will show that it is not at all meant as understanding the status of the oceans as the blue-print of climate. Nowhere else as in the polar region can warming by the ocean be better studied, when during the winter season the sun is not contributing. But the article explains its topic as follows:

__On top of the effect of human-made carbon emissions, natural changes in the warm ocean currents traveling to the icy north may be helping to heat up the entire northern hemisphere.

REMARK: Science says: Sun ray can easily pass through the outer atmosphere in order to reach the Earth, but much of the radiation escapes the atmosphere depends on the concentration of greenhouse gases (including carbon dioxide, methane etc) present.

QUESTION: What effect has CO2 at Spitsbergen during the winter season?

__Climate models produced by the Intergovernmental Panel on Climate Change (IPCC), which are tuned to reproduce the human-made greenhouse effect, predict the region should have warmed by 1.4 °C between 1960 and 2000. In fact, the Arctic's average air temperature rose by 2.2 °C.

REMARK: Not one word about the strong Arctic warming from 1919-1939

QUESTION: Can climate models work when they do not recognize nor include the warming at Spitsbergen?

__Vladimir Semenov of the Obukhov Institute of Atmospheric Physics in Moscow, Russia, says that ocean currents carrying warm water from lower latitudes into polar regions could have played a part in this increase. He analysed air temperature data from the north Atlantic, which revealed a cyclic pattern of highs and lows over the past century. He argues the length of such cycles must be explained by ocean currents, which also fluctuate over a timescale of decades.

REMARK: It is astonishing, that the transport of 'warm water into the polar region' is actually presented as if it is a new finding.

QUESTION: Is the suddenness of the warming at Spitsbergen since winter 1918/19 evidently not supporting the claim of 'cyclical pattern of currents'?

___ "It's an interesting idea - and the first time I've come across it," says Peter Wadhams, head of the Polar Ocean Physics Group at the University of Cambridge. Although the research is speculative, it is a plausible process, Wadhams says.

REMARK: The comment demonstrates where polar research stand, and how important it would be for the understanding of the climate change issue what had happened 90 years ago at the remote archipelagos of Spitsbergen.

QUESTION: Have Vladimir Semenov and Peter Wadhams ever read what Schokalsky, Brooks, Scherhag and others have said in the 1930s?

CONCLUDING REMARK: The title of Catherine Brahic's article sounds so promising, but the explanation hardly demonstrate that the mechanism in the Arctic is understood. It wouldn't have happen with more attention to the main features of the Arctic warming for two decades since the late 1910s. That is certainly not her fault.