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Key issues disproving global warming

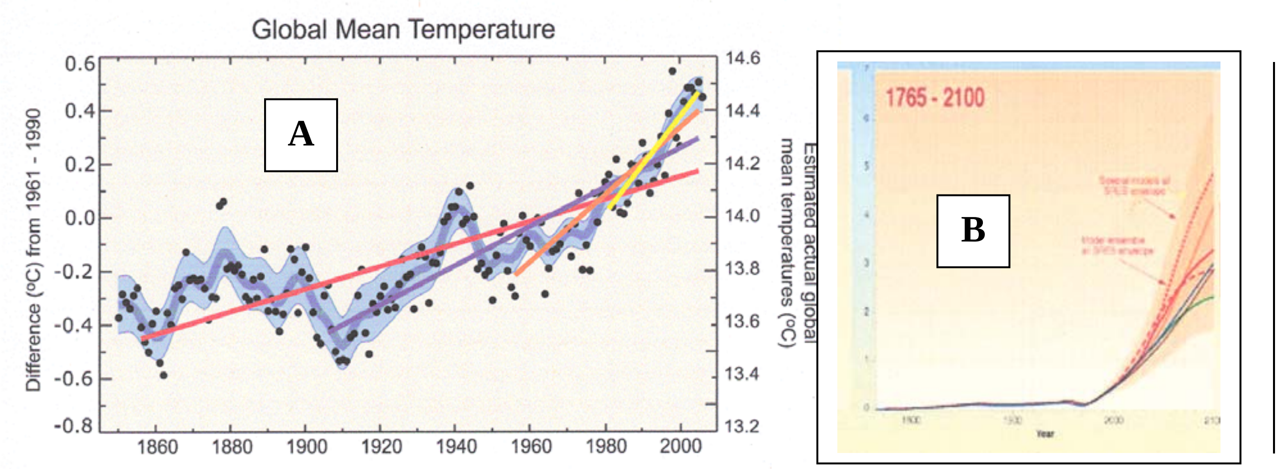
by
Friedrich-Karl Ewert*

This article is not a scientific publication. Rather it highlights frequently discussed arguments and current issues regarding the alleged danger of global warming. These key issues are based on real temperature records and field observations. Computer modelling is disregarded.

Small temperature variations or global climate change?

Temperature readings started in Berlin already in 1701, and other stations soon followed. The monthly averages from 49 stations are available at www.wetterzentrale.de [1]. The IPCC [2+3] and other institutions disregarded temperature readings registered before 1860, see Figure 1.

Figure 1: A) Temperature readings considered by IPCC (Report 2007) B) Temperature readings since 1765 supposedly accounted for by the IPCC (Report 2001, WG1, TS22), yet no data are made available.



The data from 46 of the 49 stations were evaluated and are listed in Table 1. The other three stations cover a period that is too short [4]. The evaluation includes the temperature curves based on the yearly averages and the annual rates of change derived from trend-lines. Approximately 330 temperature curves were plotted in order to examine long and short-term temperature variations. Figure 2 shows the temperature curve for Berlin that covers more than 300 years. Several short-term temperature variations are identified with trend-lines. Steep gradients indicate rapid changes.

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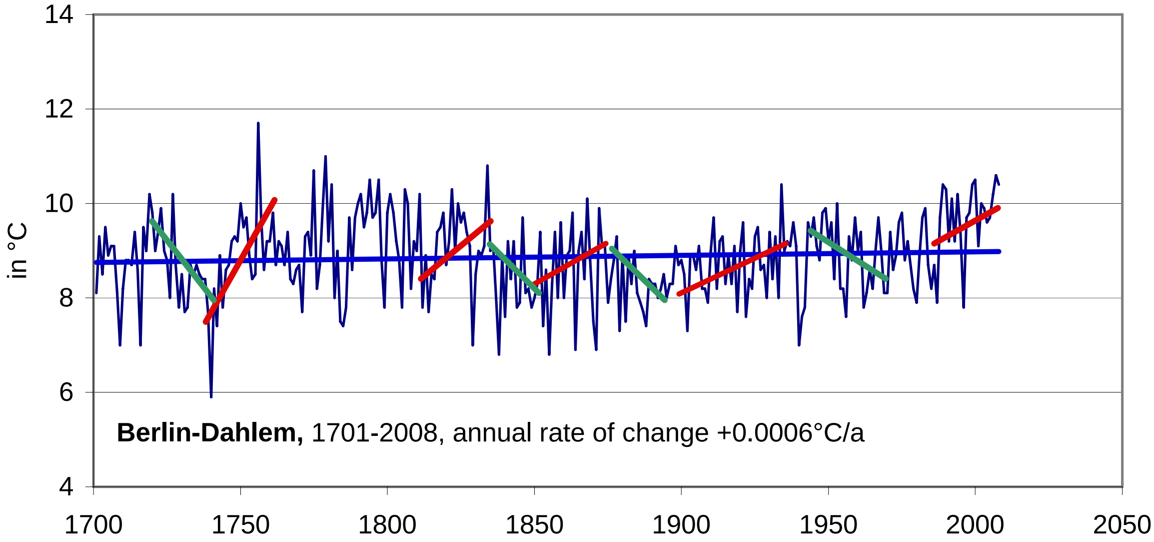
*) Prof. Dr. Friedrich-Karl Ewert, Mozarstr. 33014 Bad Driburg, Tel. 05253-3883, F: 05253-7145, ewert.fk@t-online.de

Figure 2: Temperature curve for Berlin, 1701-2008, showing short-term temperature variations (warming = red, cooling = green).



The temperature curve is based on the yearly averages. It shows the following for the area of Berlin:

- Temperatures were higher between 1750 and 1780, as well as around 1830, than in 2000.
- Phases of warming and cooling alternate, also in neighbouring regions. Details are listed in Table 2.
- Warming periods occurred at faster rates in the 18th and 19th century than they did during our recent warming.

The rates of change of the long-term temperature variations are listed in Table 1. The regions around stations marked in light brown warmed up, those in light blue remained constant or cooled. The seven cities marked in pink had significant warming due to urban development, and so their peculiar rates of change were not considered for statistical calculations.

Table 1: Long-term temperature variations recorded in 46 stations between 1701 and 2008, rates of change are in °C / 100 years [°C/100a].

Stations, periods of measurements, temperature rates of change over 100 years (°C/100a)														
warmer	constant or cooler				Due to urban development, 1900-1950, disregarded for statistical calculations									
Station	from	to	year	°C/100	Station	from	to	year	°C/100	Station	from	to	year	°C/100
Berlin	1701	2008	307	0,06	Strassburg	1801	2008	207	0,49	Friedrichshafen	1866	2008	142	1,07
De Bilt	1706	2008	302	0,48	Rom	1811	1990	179	0,11	Chicago	1873	1993	120	0,21
Boston	1753	1993	240	1,26	Oslo	1816	1988	172	0,79	Montreal	1873	2001	128	1,61
Basel	1755	1980	225	0,37	New York	1822	2005	183	2,35	Perth	1876	1988	112	0,00
Stockholm	1756	1988	232	0,37	Oxford	1828	1980	152	0,60	Tokyo	1876	1993	117	2,68
Frankfurt	1757	2001	244	0,00	Jakutsk	1830	2008	178	0,19	AliceSprings	1879	2008	129	0,22
Paris	1757	1995	238	0,08	St. Johns	1834	1993	159	0,09	Darwin	1882	1993	111	0,59
Edinburgh	1764	1960	196	0,33	Zürich	1836	2008	172	0,85	Kagoshima	1883	2008	125	1,70
Milan	1764	1992	228	0,06	Greenwich	1841	1960	119	0,69	Westmannaeyar	1884	1990	106	2,44
Copenhagen	1768	1988	220	0,22	Stykkisholmur	1841	1995	154	0,54	Flagstaff	1894	2005	111	0,63
Prague	1773	2008	235	0,17	SanFrancisco	1851	1993	142	1,12	Werchojansk	1891	2008	117	1,32
Vienna	1774	2008	234	0,15	Hanover	1856	2008	152	0,28	Matsumoto	1898	2007	109	1,79
Innsbruck	1777	1999	222	0,45	Sydney	1859	2008	149	0,87	Reykjavik	1901	2008	107	0,04
Hohenpeissenberg	1781	2008	227	0,13	Auckland	1864	1992	128	0,07	Cairns	1907	1993	86	0,16
Munich	1781	1993	212	0,00	Wellington	1864	1988	124	0,54	Prince Rupert	1911	1990	79	0,89
Stuttgart	1792	1999	207	0,07										

Table 2: Short-term temperature variations recorded at 46 stations between 1870 and 2008, rates of change are expressed in °C/annum (°C/a).

Recording Stations	1870- 1900 Temperature change in °C/a			1900 - 1950 Temperature change in °C/a			1950-1980 Temperature change in °C/a			1980 - 2008 Temperature change in °C/a		
	warmer	const.	cooler	warmer	const.	cooler	warmer	const.	cooler	warmer	const.	cooler
Berlin		0			0				0,0046	0,0377		
De Bilt		0		0,0113					0,0015	0,0579		
Boston	0,0302			0,0246					0,0025	0,0179		
Basel			0,0013	0,0183			0,0037				no data	
Stockholm	0,0028			0,0042			0,0002					0,0558
Frankfurt			0,0060	0,0070					0,0216			0,0278
Paris	0,0039			0,0026					0,0044	0,1160		
Edinburgh	0,0009			0,0055			0,0936				no data	
Mailand	0,0182			0,0194					0,0098	0,1407		
Copenhagen	0,0106			0,0208			0,0013					0,0488
Prague	0,0037			0,0198					0,0086	0,0472		
Vienna		0		0,0101			0,0099			0,0012		
Innsbruck	0,00128			0,0149					0,0052	0,0246		
Hohenpei.bg.			0,0013	0,0127					0,01972	0,0276		
Munich			0,0018	0,0136					0,0107	0,0706		
Stuttgart			0,0134	0,0209			0,0006			0,0607		
Strassburg			0,0119		no data		0,0046			0,0913		
Rome	0,0101			0,0165					0,0012		0	
Oslo	0,0077			0,0148			0,0025					0,0115
New York		0		0,0285					0,0045			0,1198
Oxford	0,0012			0,0138					0,0009			
Jakutsk				0,0036			0,022			0,0734		
St. Johns			0,0211			0,0020			0,0232			0,0415
Zurich			0,0096	0,0229					0,0074	0,0515		
Greenwich	0,0013			0,0184			0,1376					
Stykkisholmur		0		0,0231					0,0295	0,0356		
San Francisco			0,0237	0,0172			0,0098			0.0741		
Hannover			0,0395		0		0,0064			0,0581		
Sydney	0,002			0,0040					0,004	0,0309		
Auckland			0,0166	0,0112					0,0243	0,0465		
Wellington			0,0025			0,0167			0,0312	0,0088		
Friedrichshafen			0,0081	0,0186				0		0,0513		
Chicago			0,0108	0,0071					0,0417	0,0484		
Montreal	0,0138			0,0266					0,0108			0,0306
Perth	0,0243			0,0085			0,013			0,0649		
Tokyo	0,0078			0,0242			0,0357			0,0475		
Alice Springs			0,0143			0,0097			0,0127	0,0247		
Darwin			0,0181			0,0223	0,0078					0,0033
Kagoshima	0,0301			0,006			0,0186			0,0595		
Westmannaeyjar	0,0359					0,0037			0,0319	0,0823		
Flagstaff				0,0251				0		0,0417		
Werchojansk				0,0223			0,0319			0,0431		
Matsumoto				0,0177			0,0047			0,0527		
Reykjavik				0,022					0,0285	0,0164		
Cairns						0,0108			0,0176	0,0272		
Prince Rupert				0,0083					0,0295	0,0279		

In spite of the small number of recording stations, the results given in Tables 1 and 2 do reflect temperature trends for their respective regions, and are thus parts of the global climate. This is confirmed by a study published by Jones & Moberg [5]. They examined temperature readings recorded in 4138 stations on all continents, thus making their results representative for the world. Their rates of change refer to temperature readings beginning in 1860. They are listed in Table 3 for the entire observation time 1860-2000 as well as for the short-term phases 1920-1944, 1945-1976 and 1977-2001, respectively. The original paper gives the figures in °C/10a. In Table 3 they are given in °C/100a for easier comparison with Table 1.

The rates of change of both groups matched up. Their small magnitude does not support the overall assertion of climate change, rather merely indicates slight to moderate temperature variations.

- On average, the temperature on all continents increased for the whole period at a rate of 0.62°/100a.
- Similar to Table 2, the short-term phases show periodic temperature variations with warming from 1920 to 1944, then cooling from 1945 to 1976, and warming again from 1976 to 2001.
- It does not include the recent cooling phase, as the study ended in 2001.

Table 3: Long-term and short-term temperature variations, 1961-2001, on all continents.

	Temperatures in °C/100a			
Continent	1860-2001	1920-1944	1945-1976	1977-2001
Europe	0.490	0.06	-0.29	4.25
North America	0.540	2.02	-1.03	2.89
Asia	0.570	0.47	0.2	2.83
Arctic	0.980	2.74	-1.56	3.64
Australia	0.600	0.36	1.26	0.55
Africa	0.600	1.36	-0.73	2.84
South America	0.550	2.49	-0.06	1.25
Average	0.62	1.36	-0.32	2.6

The regions surrounding the 27 stations listed in Table 1 that experienced warming are distributed as follows:

- > 0 < 0.5°C/100a – 18 Stations. 46.15 %;
- > 0.5 < 1.0°C/100a – 7 Stations. 17.95 %;
- > 1.0 < 1.5°C/100a – 2 Stations. 5.13 %.

The region surrounding the 12 stations listed in Table 1 that experienced cooling are distributed as follows:

- > 0 < -0.5°C/100a – 8 Stations. 20.51 %;
- > -0.5 < -1.0°C/100a – 3 Stations. 7.69 %;
- > -2.0 < -3.0°C/100a – 1 Station. 2.56 %.

Table 2 does not differentiate between stations. All continents experienced warming, distributed as follows:

- > 0 < 0.5°C/100a: 1 continent. 14.3 %;
- > 0.5 < 1.0°C/100a: 6 continents. 85.71 %;

These rates of temperature change support the above mentioned conclusion: merely slight to moderate temperature variations took place, and not an actual climate change.

Finally a discrepancy between Table 1 and Table 2 has to be commented on. Table 1 shows 12 stations experiencing long-term cooling, Table 2 shows none of them. The reason is twofold:

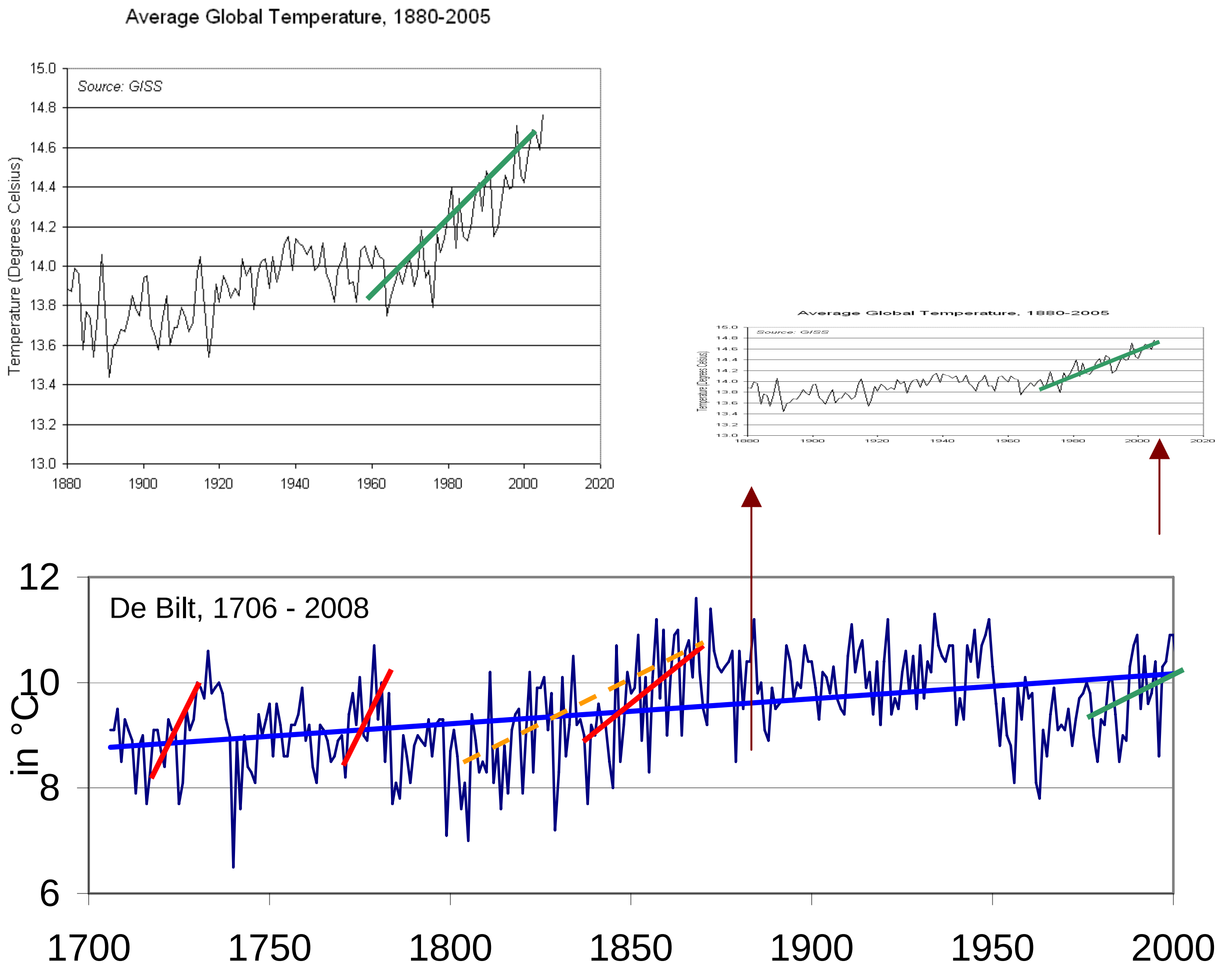
- Table 1 deals with a much longer recording period – 300 years instead of 140 years.
- On a global scale, the warming areas dominate, and with approximately 100 times more stations included in Table 2, they dominate as well.

Plotting y-axis using a stretched scale gives the impression of great change

This is an important issue when it comes to informing the public because it attracts attention and sparks an intended impression, especially for policy makers. Before discussing an example, it is important to remember that the gradient of the trend-line illustrates the rate of temperature change – the steeper the gradient, the faster the change.

Graphical representations from the IPCC or GISS (and other institutions) give the false impression of dramatic temperature increase, as illustrated by Figure 3. If the stretched Y-axis scale (above left) was reduced and used the same scale as De Bilt (above right), the increase between 1980 and 2005 would appear much smaller when compared to the various increases between 1700 and 1850 shown below. Warming indeed actually occurred much faster during the pre-industrial age, even though the IPCC and other institutions claim that the extraordinary rapid changes between 1980 and 2005 were caused by anthropogenic CO_2. The alleged dramatic increase between 1980 and 2005 is merely a graphical distortion produced by an extended Y-axis scale, and thus does not correctly illustrate reality.

Figure 3: Using a stretched vertical scale produces the impression of a dramatic temperature increase between 1980 and 2005.



Regional distribution of warming and cooling

Regional distribution of warming and cooling is important as regional cooling and global warming cancel each other out. If warming and cooling take place in adjacent regions, then global warming cannot be diagnosed, irrespective of the rates of change.
In Table 4 stations with equal or similar temperature trends are arranged in groups of decreasing order according to their regional mean values. It becomes obvious that warming and cooling occurred at the same time and directly adjacent to each other:

- Groups 1 and 2 experienced greater warming due to urban development.
- In Groups 3 to 12, warming decreased from 0.76°C/100a to 0.11°C/100a.
- In Groups 13 to 18, cooling occurred from –0.04°C/100a to –0.33°C/100a.

- The region of Westmannaeyar (Island) experienced a pronounced cooling; the value of -2.44°C/100a has to be examined.

Table 4: Regional warming or cooling

Stations arranged in regional groups of similar temperature trends	1701 - 2008 Local Mean Max	Min	Region Average
warmer	(°C/100a)		
1*) Tokyo,Kagoshima,Matsu.	2.68	1.70	2.06
2*) Boston, New York > Montreal,San Francisco	2.35	1.12	1.58
3 Werchojansk, Jakutsk	1.32	0.19	0.76
4 Strassburg,Friedrichsh. > Basel,Zurich,Hohenp.berg	1.07	0.13	0.70
5# Flagstaff			0.63
6 Edinburgh,Oxford,Greenw.	0.69	0.33	0.54
7 Oslo,Stockholm,Copenh.	0.79	0.22	0.46
8 Sydney,Alice Spr.,Cairns	0.86	0.16	0.41
9 Stykkisholmur,Reykjavik	0.54	0.04	0.29
10 Prague,Vienna	0.17	0.15	0.16
11 Berlin,De Bilt,Hannover	0.28	0.06	0.17
12 Rome			0.11

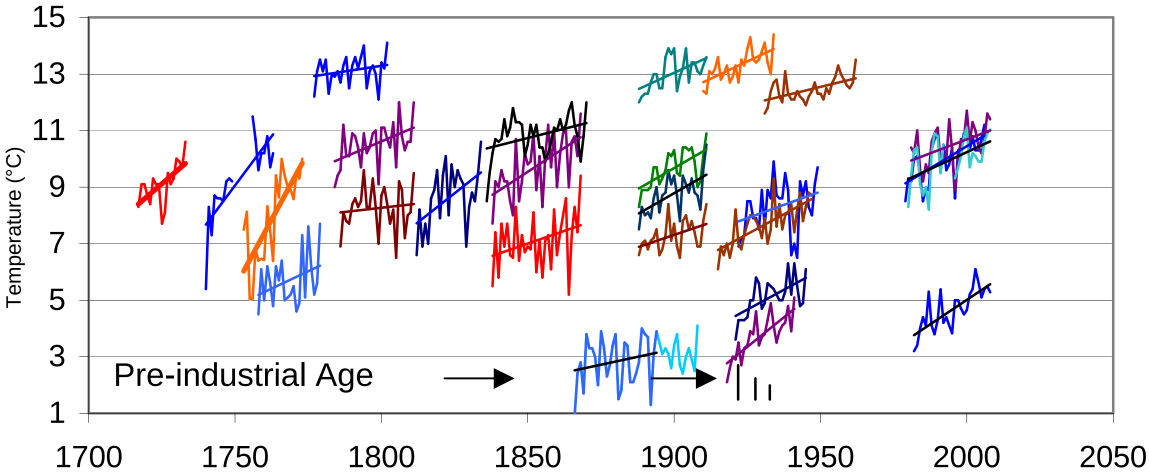
Stations arranged in regional groups of similar temperature trends	1701 - 2008 Local Mean Max	Min	Region Average
Cooler or constant	(°C/100a)		
13# Milan			-0.06
14 Stuttgart,Munich,Innsbr..	-0.46	0	-0.18
15 Auckland,Wellington	-0.54	0.07	-0.24
16 Perth,Darwin	-0.59	0	-0.30
17 St.Johns,Chicago,Rupert	-0.88	-0.09	-0.33
18 Paris,Frankfurt	0.08	0	-0.04
19+) Westmannaeyjar			-2.44

*) *stronger warming due to urban development*
+) *data subject to verification*
#) *single station only*

Cause of temperature variations

Anthropogenic CO_2 has supposedly caused our recent warming because it has allegedly occurred much faster than during pre-industrial times. This rapid temperature development is viewed as irrefutable proof. However, the contrary has occurred. Pre-industrial temperature rises occurred at even faster rates. Many short-term periods with steep gradients are seen from the temperature curves that were obtained from evaluating the data sets from the 46 stations [4]. They are for all periods between 1700 and 2008. Their plots in Figure 4 demonstrate that steep – and even steeper – gradients occurred frequently during pre-industrial times when anthropogenic CO_2 was not a factor at all.

Figure 4: Rapid warming occurred at many locations at all times, irrespective of atmospheric CO_2 concentration.



An additional statistical evaluation revealed that during earlier centuries, when anthropogenic CO_2 was absolutely negligible, even faster temperature rises took place than those during the last 1980-2008 warming phase [4]. Thus anthropogenic CO_2 cannot be the sole cause of temperature variations. This result collaborates with all other relevant facts, including the statement from

FRANKE'S Encyclopedia of Physics published in 1959 [6]: *"As a greenhouse gas, CO_2 is unimportant"*. At that time "climate hysteria" had not yet existed.

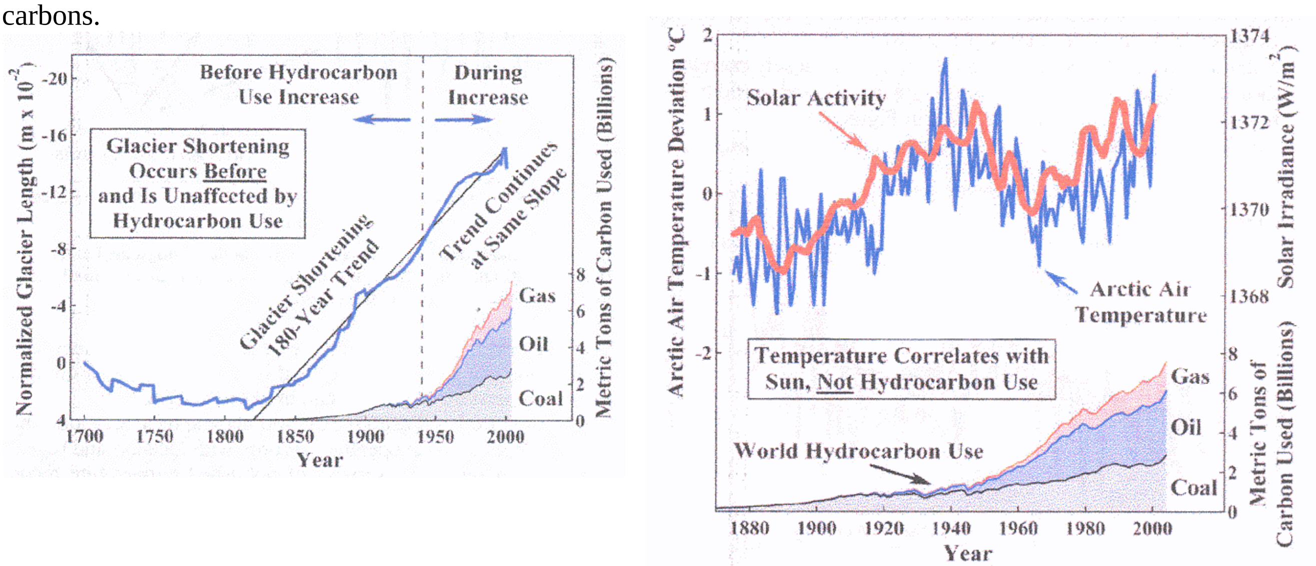
DITTRICH [7] showed that the absorbable portion of return radiation is nearly used up by the present CO_2 concentration. Even if all stockpiled coal, oil and gas were burned, additional warming would be limited to only a few tenths of one degree centigrade over the long run. Water vapor instead is believed to be the overwhelming greenhouse gas – as everybody realizes when comparing the rapid cooling during a starlit night to the subdued cooling under cloudy skies.

Formerly it was assumed that vapor contributes about 88% to the greenhouse effect while CO_2 reaches a share of 12%. In view of the very dissimilar concentration and absorption capacity, the latter always appeared to be overstated. JAWAROWSKI [8] considered the following relations:

- Water vapor – 95 %
- CO_2 (and other greenhouse gases) – 5 %
- originating from land and oceans – 97 %
- anthropogenic production – 3 %
- Anthropogenic contribution to greenhouse effect – 0.12 %

Details regarding the greenhouse effect cannot be dealt with here. Throughout its 4.5-billion year history, the earth's temperatures were always primarily regulated by the sun. Among others, ROBINSON, ROBINSON + SOON [9] have produced convincing proof that CO_2 is not the ruling driver. The graphical relations between glacier-melting, solar activity, temperature variations and consumption of coal, oil and gas shown in Figures 5A and 5B, are self-explanatory and require no further comments.

Figures 5A+B: Glacier-melting, solar activity, temperature variations and consumption of fossil hydrocarbons.



How to determine the atmospheric CO_2 concentration and what are the consequences?

Quantitative analysis of atmospheric CO_2 concentration is not really a key issue in the public discussion. However, it is much more than a key issue – it is the origin of the 'global warming' phantom. Therefore it must be commented on.

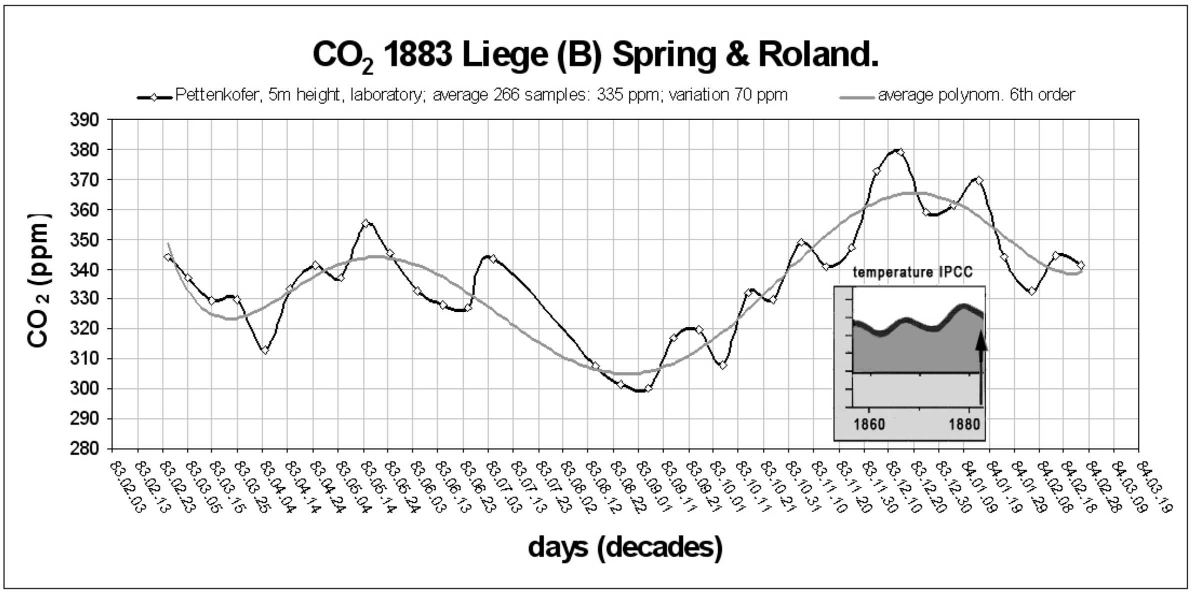
Although the methods of analysis cannot be dealt with here in detail, brief comments are nevertheless required. It has been possible to determine the atmospheric CO_2 concentrations since

1810 using direct analytical means. In 1957 an indirect method was implemented by C.D. KEELING: CO_2 concentrations in air-bubbles trapped in glacier ice and extracted by means of core borings are determined spectrometrically. However, it is increasingly recognized that this latter method often yields inaccurate results which, in view of all the influential factors, is easily explainable.

The IPCC refuses to acknowledge the results of direct chemical analyses; rather it prefers the KEELING-results, which yield a nearly constant atmospheric CO_2-content of approximately 280 ppm for the last 3000 years. In contrast, BECK [10] collected and evaluated the results of about 90,000 direct chemical analyses carried out since 1810 and published them in numerous papers. His evaluation, based mainly on examining relevant literature, yields a much different result: the atmospheric CO_2-content fluctuated considerably, with abrupt changes during a period of few days (24-25 July 1876: 290-390 ppm), over weeks and months (February 1883 – March 1884: 300-380 ppm), over mid-term periods of years and during long-term periods of more than hundred years (1810 – 1960: 300 – 440 ppm). Overall the variability in atmospheric CO_2 concentration is much greater than what has been known and used thus far for calculations. Examples showing variation for periods of different lengths are illustrated in Figures 6, 7 and 9 [10]:

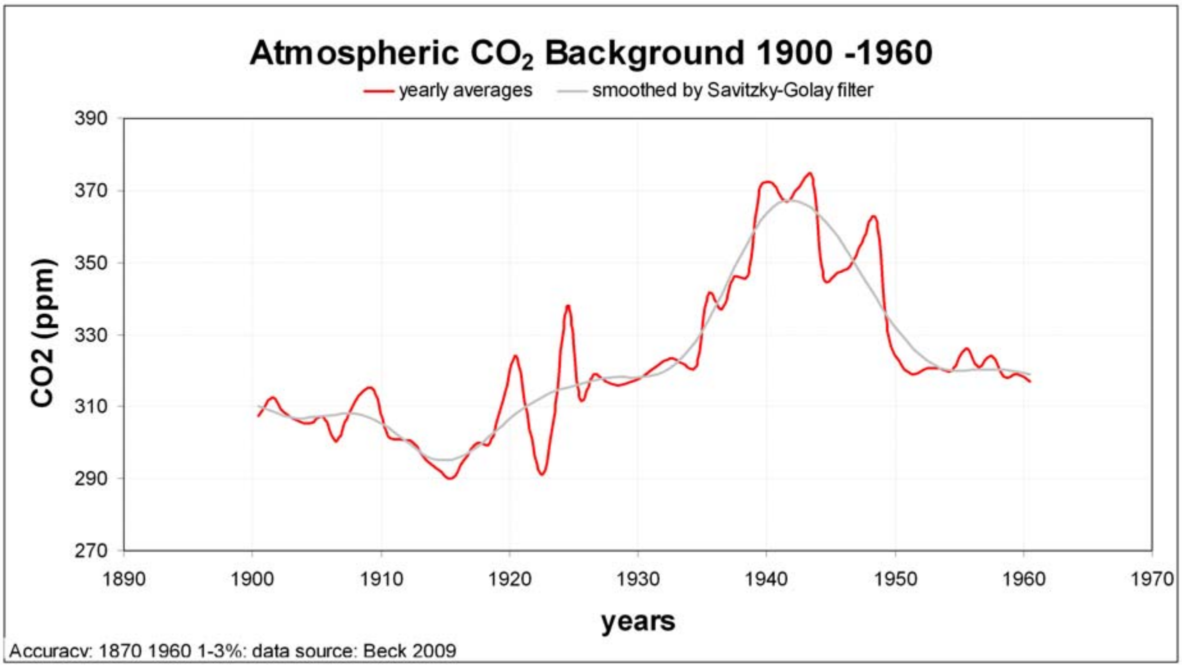
- Figure 6, 300-380 ppm, period of February 1883 to March 1884, recorded in Liege
- Figure 7, 290-370 ppm, period of 1900 to 1960
- Figure 9, 300-440 ppm, period of 1810 to 1970

Figure 6: Direct chemical analyses prove that wide variations in CO_2 concentrations existed, for 1883 in Liege, France.



It should be noted that the CO_2 concentrations shown in Figures 7 and 9 do not coincide for the period around 1940: 370 versus 440 ppm. This difference is explainable: Both graphs do not cover identical areas. Moreover, Figure 6 displays the yearly averages and Figure 8 presents the 5-year averages. Nevertheless, disregarding details, both curves match fairly well for the period between 1900 and 1960.

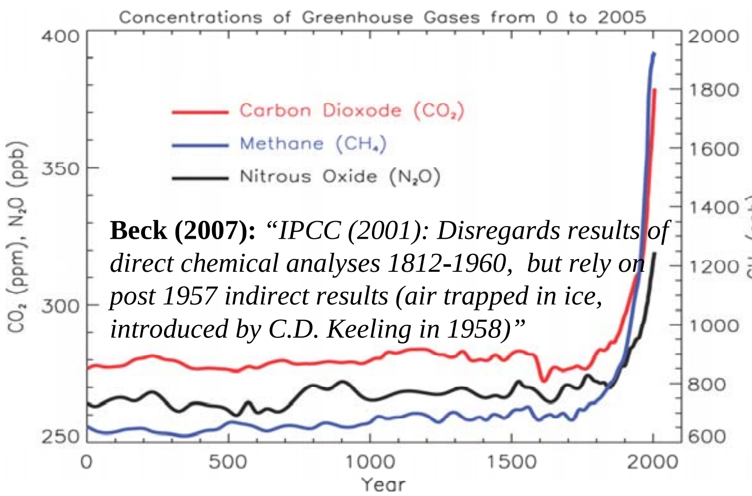
Figure 7: Direct chemical analyses prove that variations in CO_2-concentrations existed between 1900 and 1960.



Of course, direct chemical analyses should be the preferred method, and indirect determinations should only be regarded as a substitute for earlier times when direct analysis was not available. It is simply incomprehensible that the IPCC rejected using the direct chemical analyses and opted to use indirect analyses, as Figure 8 illustrates [3].

Figure 8: Alleged greenhouse gases concentrations, used by the IPCC.

IPCC: Greenhouse gas concentrations

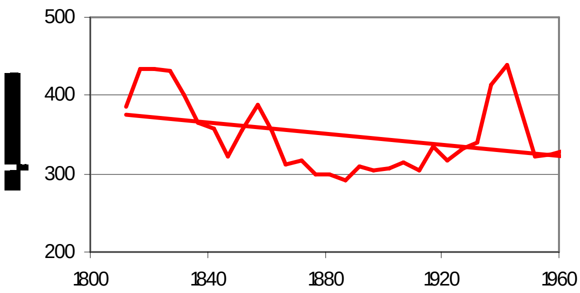


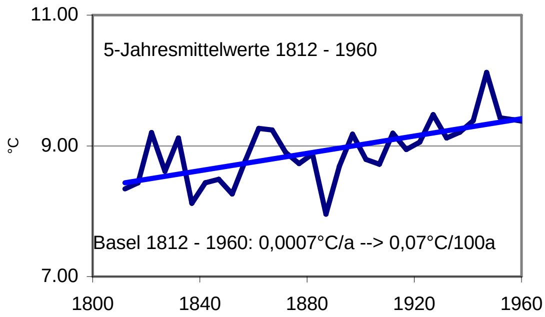
The method applied by the IPCC assumes a nearly constant CO_2 concentration of about 280 ppm over the last 2000 years. This has been contradicted by several authors, among them JAWAROWSKI [8]. EWERT [4] concludes that CO_2 concentrations during the pre-industrial age were often much higher than those used by the IPCC. Furthermore, the results elaborated by BECK [10] convincingly prove the existence of short-term, mid-term and long-term fluctuations of atmospheric CO2 concentrations.

Figure 8 also confirms that the constant greenhouse gas concentration assumed by the IPCC [3] for the last 2000 years is not correct. It shows that greenhouse gas concentration remained about the same in spite of all the temperature variations. If the present temperature rise depends on increasing CO_2 concentration, then a similar, causal dependency ought to have been postulated for the past. The temperature variations of the past should have fluctuated along with the CO_2 concentration. However, the graph in Figure 8 does not reveal such variations.

For the period 1810-1960, BECK [10] compared the 5-year average of temperatures in Basel with CO_2 concentration for the northern hemisphere (Figure 9). It is noted that not only did a contrary trend occur, but CO_2 concentration fluctuated considerably and reached much higher levels already 200 years ago (440 ppm) when anthropogenic CO_2-production was still negligible. BERNER et al [11] present even more convincing proof of the non-relationship between CO_2-concentration and temperature. About 300 million years ago probably the strongest glaciation ever occurred. The glacier reached southwards to approx. 35° latitude despite an atmospheric CO_2 concentration of at least 1000 ppm.

Figure 9: Opposing trends between CO_2 concentration and the temperature in the northern hemisphere in Basel between 1810 and 1960, 5-year average [10].





The low and nearly constant atmospheric CO_2 concentration assumed by the IPCC actually never existed. Consequently, recent CO_2 concentrations and their trends must be viewed differently. The disregard of 90,000 chemically determined CO_2 concentration measurements implies an absolute distrust of chemical analytics used in the 19^{th} and 20^{th} century. How can we be expected to trust the correctness of quantitative analysis for iron or sulfate – or whatever – if we refuse to even acknowledge the results of CO_2 analyses – particularly when we take the sources of error using the KEELING-method into account? They are probably greater than those of the conventional and proven chemical analytical methods.

Biochemical equilibrium

In the media we often hear or read that CO_2 is a poison. But we must recall that plants use CO_2 and water to generate glucose via photosynthesis (and oxygen):

$$\mathbf{6CO_2 + 6H_20 \rightarrow C_6H_{12}O_6 + 6O_2}$$

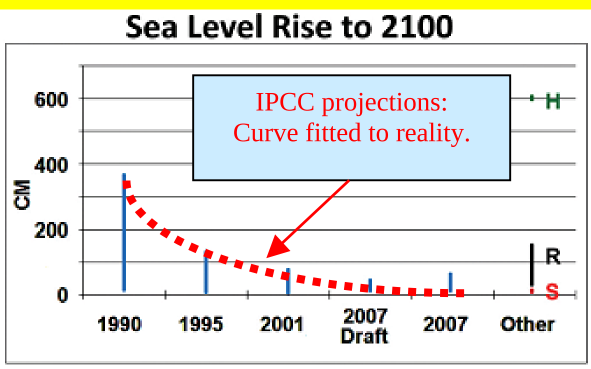
This simply means that CO_2 is the main ingredient of the food chain – and life. Without CO_2, there would be no bread, no vegetables, no butter, no meat, etc. Therefore. when calculating a balance for CO_2, it is absolutely wrong to focus only on physical equilibria. One comes to wrong conclusions – perhaps without being aware of it – if the essential factors for terrestrial life are disregared: CO_2-supply, water-supply, temperature, type and quality of soils as well as LIEBIG's law of the minimum. For aquatic life, the influential factors are even more complex and decisive. Not all plants are well provided for with an atmospheric CO_2 concentration of 300 or 400 ppm. Many plants would benefit further from higher CO_2 concentrations as KÜPPERS [12] has proved. Foresters have noticed an increased growth of trees, and tests have shown wheat yield would be 35% greater if the CO_2 concentration doubled. Dutch farmers even pump CO_2 into their greenhouses to improve tomato yield. An increase in atmospheric CO_2 concentration also steadily creates a new biochemical equilibrium. If this is ignored, purely physical calculations will fail completely.

Rising sea levels?

Sea level variations are a normal geological occurrence. Melting glaciers deliver water into the oceans, with large amounts causing sea level rise around the world. In addition to such eustatic rises, isostatic rises also occur. They are caused by rising or sinking seabed due to inflowing or out flowing magma. Eustatic changes act worldwide, isostatic ones are limited to local regions. Rising or dropping water levels shift the coastline – known as transgression or regression.

During the last glaciation the ocean level was 120 m below our present level. In the end, the glaciers delivered water to the oceans and caused their levels to rise accordingly. The increasing melt-water volumes shifted the coastline between Scandinavia and Britain southeastwards, thus creating the North Sea and separating Britain from the continent. That process went on as the glaciers retreated, lasting until about 8000 years ago, before slowing down. Variations in the level of the North Sea are still occurring, and now they are governed by a sinking seafloor. The IPCC assumes that the recent warming causes a tremendous glacial reduction, which in turn, results in considerable sea level rise.

Contrary to geological experience, in the early 1990s the IPCC postulated a global sea level rise for the 21st century of maximum 3.67m. But as it turns out, that was overly exaggerated. Hence, it is understandable that the IPCC has reduced its projections step by step over the years, as compiled by PULS in Figure 10. Today sea level rise is expected to reach 0.38 m/100a on average (IPCC-Report 2007). It is quite likely that even this rate will not be accepted in the near future, but will be further revised significantly downwards because of the new cooling phase which started several years ago. This cooling phase will stockpile more ice at the poles and glaciers, and will inevitably reduce or end the supply of water from glaciers to the oceans.



	IPCC 1990	IPCC 1995	IPCC 2001	2007 Draft	IPCC 2007	Hansen (H)	Rahmst. (R)	Singer (S)
Max	367	124	77	43	59	600	140	20
Min	10	3	11	14	18	600	50	18

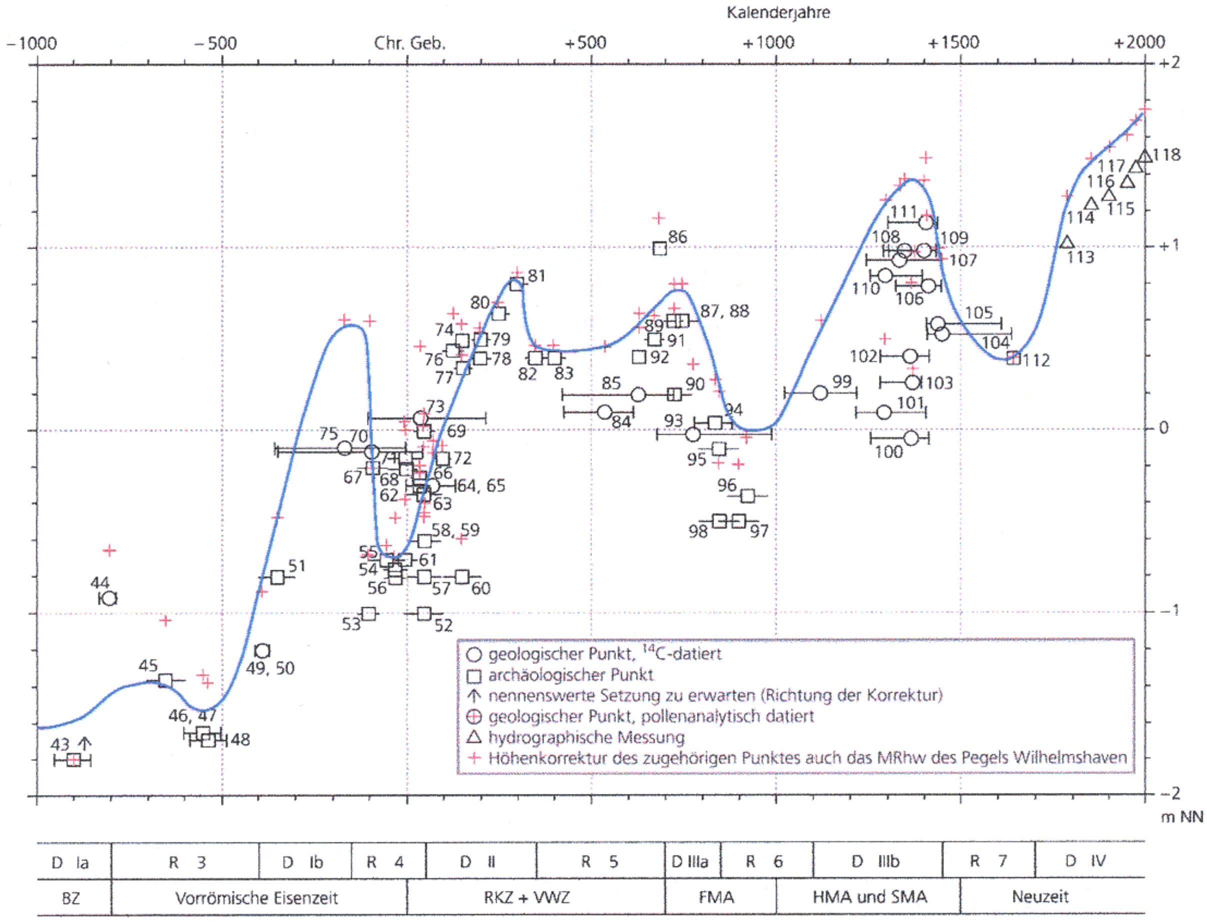
Figure 10:
Continuous downward revision of projected seal level rises by the IPCC.

Sea level variations in the southern part of the North Sea have been studied recently by PULS [13]. Regardless of the temporary regressions and transgressions, the sea level rose about 3.3 m during the last 3000 years (Figure 11). The rate of change of rising and falling varied over centuries, and for the latest rise beginning at 1600, the following rates have been measured:

- 1600 till 1800 – 0.85 m, i.e. 0.45 m/100a
- 1800 till 1900 – 0.20 m, i.e. 0.20 m/100a
- 1900 till 2000 – 0.20 m, i.e. 0.20 m/100a

Thus, it amounts to a total rise of 1.25 m for the 400-year period.

Figure 11: Sea level rise in the southern North Sea during the last 3000 years.



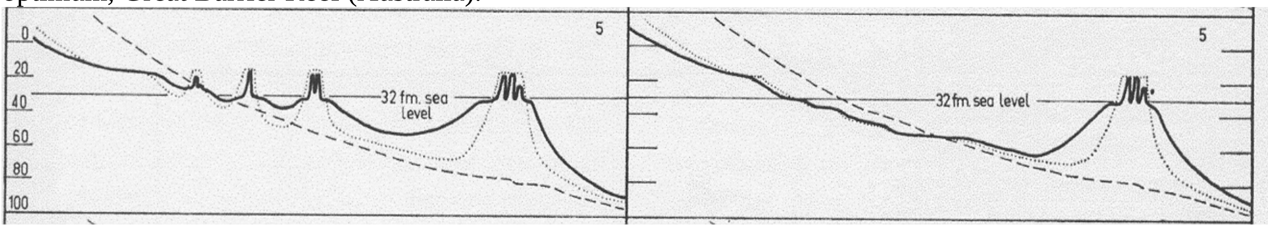
At the outset we distinguished between eustatic and isostatic sea level changes. In principle the latter applies to the North Sea because the seafloor is sinking due to the slow migration of magma towards the northeast where it is needed to compensate for the uplift of Scandinavia. Scandinavia is moving upwards to a new isostatic equilibrium. This began after its huge glaciers melted, thus removing their heavy loads.

The years between 1600 and 2000 comprise the Little Ice Age and subsequent recovery from 1700 and 2000. Intense melting of glaciers can be excluded for the 17th and 18th centuries. The recent retreat of glaciers began around 1850, as shown in Figure 5. Thus, the rise of the North Sea level was – and is – mostly isostatic, which is limited to this region. It does not signify a eustatic rise of global sea level. To the contrary, it seems that such a eustatic rise is either very small, or it did not even occur during the latter centuries. This is substantiated by observations that we will now explain.

Coral reefs grow as long as their uppermost layer remains below the water level. Deep reefs are produced if the seafloor sinks and is in sync with reef growth. Reef growth ends if the seafloor stops sinking, or the water level drops. In the latter case, the reef dries up. This is exactly what happened during the last centuries as the following two cases illustrate.

The Great Barrier Reef along the eastern coast of Australia repeatedly shows isolated dark rocks of coralline limestone rising a few meters above the normal water level. According to MAXWELL [14] they are remnants of a reef flat which has not yet fully eroded. That particular reef grew during periods of higher sea level, which reflects an earlier warming period when glaciation was minimal and the ocean level was correspondingly high – probably during the mediaeval climate optimum. Subsequent cooling enlarged the glaciers and, hence, the ocean level fell. As a result, the upper section of the reef dried up and died. This process still continues today and the water has remained at a low level for centuries (Figure 12).

Figure 12: Remnants of a reef flat indicate a higher ocean level existing during the mediaeval climate optimum, Great Barrier Reef (Australia).



Similar features exist at the antipodes of the globe. Along the shores of Caribbean Islands, reef flats still exist a few meters above today's water level. They indicate a correspondingly higher sea level at the time of their growth. Such a reef flat exists near the beach of Sosua at the northern coast of the Dominican Republic. Its surface is approximately 3.5 m above the water level. Most probably a similar development took place as that described for the Great Barrier Reef. Reef growth occurred at a higher water level until the end of the mediaeval climate optimum, and then growth ended and was followed by drying up as sea levels dropped because of growing glaciation.

The author photographed the reef flat and the coralline fossils about 40 years ago (Figure 13), with the photo showing that Sosua Beach is new. The big stone indicated by the red arrow at the shore has neither changed its position nor its function. Children are still using it as a springboard today. Its position proves that the sea level has not changed over the last 40 years – and if it has, then only by a few centimeters, namely downwards!

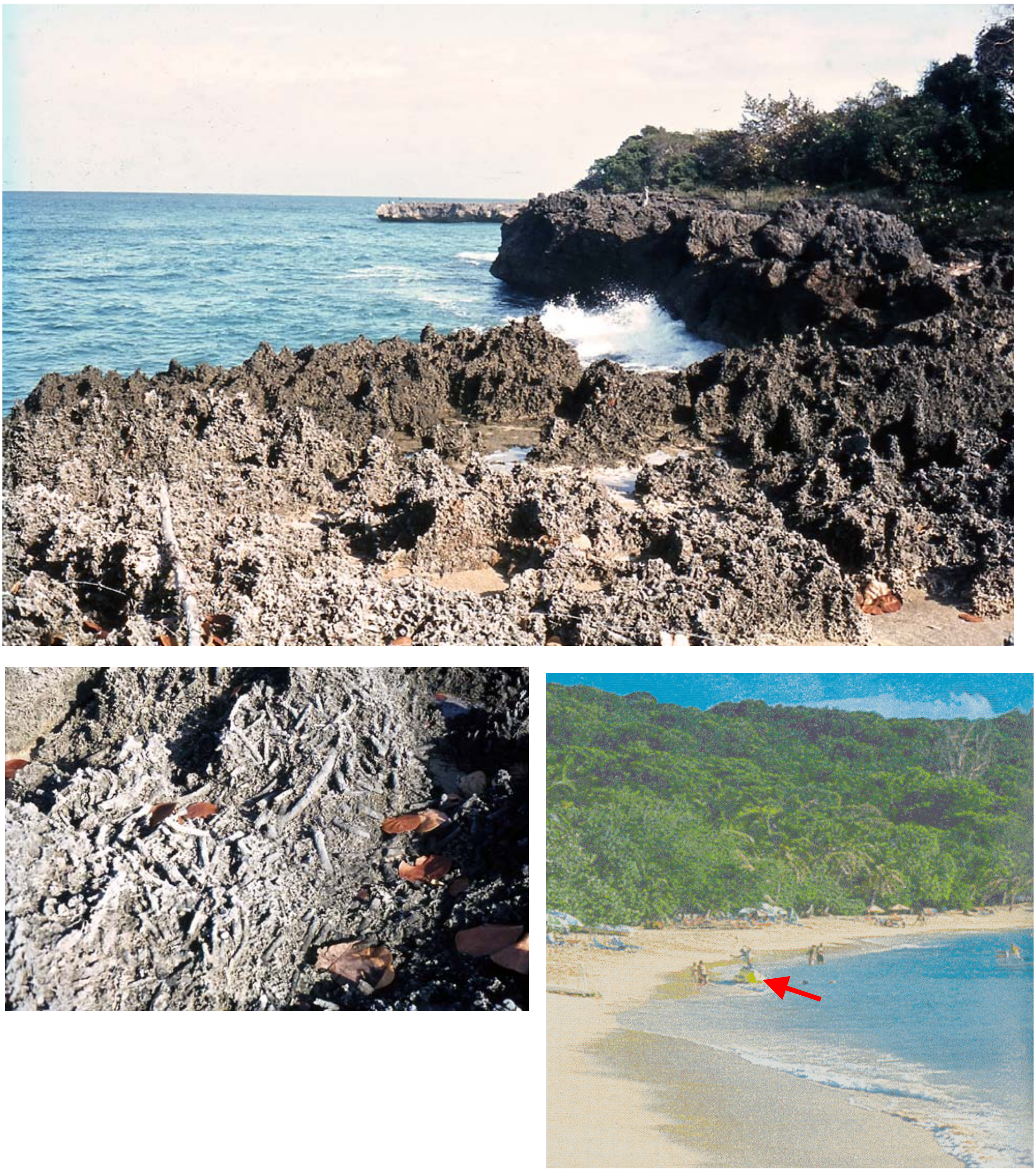
The remnants of a reef flat at the Great Barrier Reef east of Australia and the reef flat along the shores of Caribbean Islands have most probably the same, synchronous origin. The conclusion that a considerable eustatic rise of the ocean level has not occurred during the last centuries is rigorously supported.

Climate definitions and contradictions

Neither climate definitions nor contradictions are key issues in the public forum. But they have to be dealt with because they are essential parts of the problem.

The climate has always changed; stable periods were usually short-lived. Long before climate change became an issue and its natural origin known, VON REGEL in 1957 differentiated between 'temperature variation' and 'climate change' [15]. Temperature variations are of smaller extent and do not impair the conditions of life as climate changes certainly do. The increase or decrease in temperature that turns a temperature variation into a real climate change is not defined yet – perhaps that is intended.

Figure 13: Reef flat a few meters above water indicate that an even higher sea level existed earlier in the millennium and that the reef had been growing. Today the sea level is at the same position as 40 years ago.



The mean temperatures in Berlin and in Frankfurt/Main are 8.8°C and 9.7°C respectively. The difference of 0.9°C hardly impairs conditions for life, and both regions share a similar climate. Thus, the difference of 0.9°C is not really a climate change, but merely a temperature variation. By contrast, Milan has a mean temperature of 12.77°C, thus the difference to Berlin or Frankfurt is 3.97°C or 3.04°C respectively. Milan certainly belongs to a different climate region. This simple comparison proves that it one has to distinguish between a temperature variation and a climate change, and that the difference in between is certainly more than 1°C. The order of the difference is questionable and other parameters are important too. Without a binding rule, even the smallest variation will be seized upon for advocating climate change. Such climate changes can also be utilized to accomplish political or economical goals.

The IPCC reports point out: *"Climate in a narrow sense is usually defined as the 'average weather' over a period of time. The classical period is 30 years, as defined by the World Meteorological Organization (WMO)."*

Comparing this definition with IPCC's own practice reveals remarkable contradictions:

- According to Tables 2 and 3, cooling dominates the period between 1950 and 1980. Why did the global climate change become an issue during the 1980s? Recall that the IPCC was founded in 1988! Either the professionals involved were not aware of the facts, but did not hesitate to carelessly formulate a global catastrophe, or politicians simply used that approach to pursue their goals.
- The period between 1980 and about 2005 experienced warming. The IPCC rule requires a long-term observation to permit reliable assessments. Applying the 30-year rule, 60 years would be the shortest permissible time to identify a variation, provided the second period is significantly warmer or cooler. The IPCC did not bother to wait for the second period, and were already sure after just the first 10 years, that we were already facing a global climate change caused largely by our CO_2. The enormous consequences of their prognosis normally would require professional excellence. The example of rising sea level illustrated in Figure 10 sufficiently characterizes the IPCC's working attitude, and so the question arises: Could other predictions be more reliable?

Conclusions

When the conditions of life are accepted as the decisive criterion, the rates of change listed in Tables 2 and 3 characterize only temperature variations instead of a real global climate change. In addition to regional cooling, a slight warming, within the scope of periodic temperature variations, occurred until 2000. It more reflects the recovery from the Little Ice Age, with the warming period between 1980 and 2000 having probably reached its end as solar irradiance would suggest in Figure 14. In 2002 the trend turned. Figure 15 reveals that temperatures are again decreasing.

Figure 14: Infrared irradiance (from the internet)

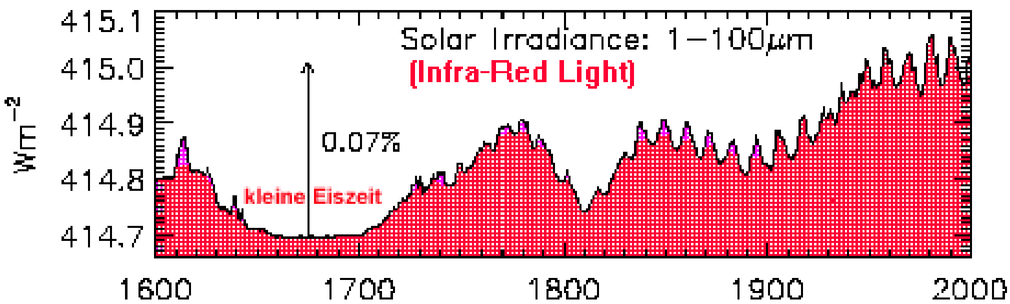
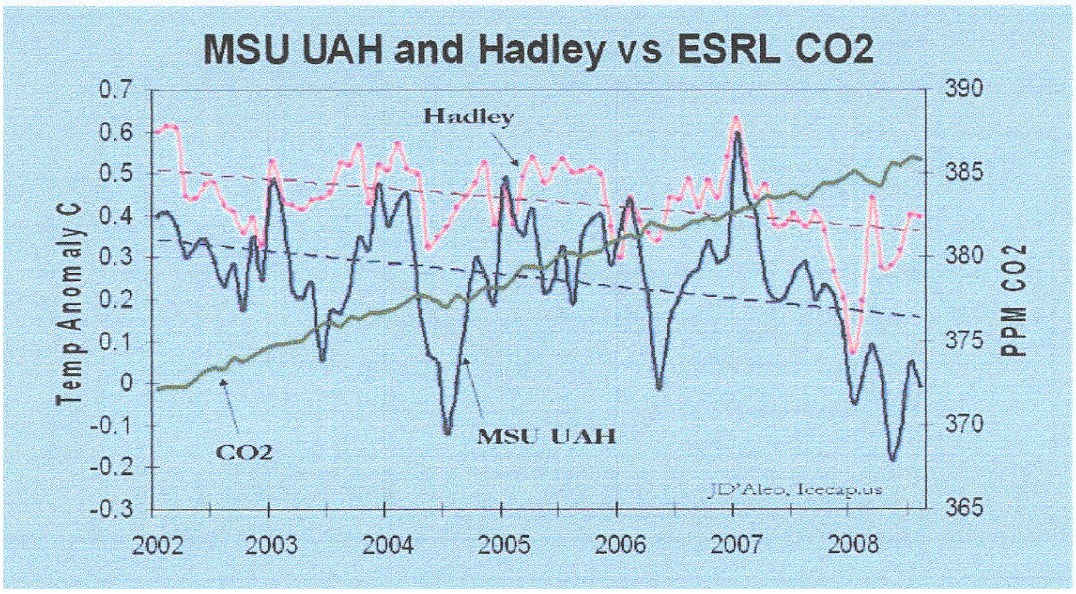


Figure 15 also illustrates that the atmospheric CO_2 concentration continues to increase. This discrepancy supports the assertion that there is no correlation between temperature and CO_2-content.

The IPCC considered only temperature readings taken after 1860 and CO_2-measurements since 1960. Temperature readings carried out before 1860 and the results of direct chemical CO_2-analysis were not taken into account. Then using computer modelling, the selected data were used to develop a scenario for this new century. Furthermore, by distorting the scale in prominent graphs, the IPCC produced the impression of great danger to our industrialized societies. However, the results presented by the IPCC fail to agree with reality.

Figure 15: Decreasing temperatures since 2002 despite increasing CO_2 concentration.



JAWAROWSKI [8] characterized the disregard of 90,000 direct chemical CO_2-analyses understandably as *"the greatest scientific scandal of our time"*. After studying natural sciences and life-long work in geology, it is stunning to realize that an intergovernmental panel believes that 150 years of CO_2 data are not worth being considered for conducting a comprehensive scientific analysis.

Expression of thanks

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