Warsaw 2021.09.02

P.415051 Human activities resulting in an increase in the Earth's non-snow surface cause global warming of the Earth [1]. Supplement added.

The above study - its author used it in the patent application P.415051 in Poland on 2015.11.28. The solution can be used to regulate the amount of rain.

Allow me to introduce myself. My name is Adam Bednarczyk. I am a Polish citizen and a US citizen. I am a fine mechanical engineer by education, specializing in airborne and automatic devices. I am a passionate physicist and spent twelve years as an academic physics teacher.

In current publications it is believed that the increase in the amount of carbon dioxide in the Earth's atmosphere is the main factor causing global warming of the Earth. However, the facts we can observe in nature as well as theoretical studies contradict this statement.

In a very simplified way **[2],** the phenomenon of heating up the Earth's atmosphere can be described by the greenhouse effect. In order for the greenhouse effect to work well, it is necessary to have an enclosed space with a part of cover permeable to visible radiation and low permeability to infrared radiation. The visible solar radiation penetrates into the enclosed space, the substances inside the enclosed space are heated by visible solar radiation. The substances heated up by solar visible radiation radiate their energy in the form of infrared radiation, which cannot go outside because the covering substances are not transparent for that radiation. This process results in an increase in temperature inside the greenhouse.

Greenhouse gases are **[2]:** water vapour, water vapour with clouds, carbon dioxide CO_2, methane NH_4, nitrous oxide N_2O, ozone O_3 and freon compounds. Table 1 **[3]** shows the theoretical infrared absorption values for hypothetical atmospheres that of the gases listed in column 1.

In the case of the Earth's atmosphere consisting only of water vapor and clouds, the absorption of infrared radiation in such atmosphere is eighty-five percent. The second case of interest for us is a hypothetical atmosphere that does not contain carbon dioxide. Such an atmosphere absorbs ninety-one percent of infrared radiation.

This result shows that carbon dioxide alone absorbs only nine percent of infrared radiation. Using the linear approximation method, it can be demonstrated that a small increase in the amount of carbon dioxide can result in a very small, negligible increase in the absorption of infrared radiation by carbon dioxide. This small increase in infrared absorption cannot dominate the greenhouse effect.

Another proof that greenhouse gases excluding water vapor and water vapor with clouds have little effect on the temperature of the earth's atmosphere is the behavior of the earth's atmosphere in the deserts. Whoever has been in the desert knows that the temperature drops quickly after sunset.

In central European climate we observe an approximately ten degree drop in temperature after sunset with the average relative humidity of 78% [4].

According to the data [5], I quote „25.06.2020 · In those **deserts, temperatures** can **drop** from 100 degrees Fahrenheit during the day to 40 degrees during the night so the temperature drop on mentioned deserts is over" - drop of 33 degrees in Celsius.

The very fact that in the deserts we are dealing with a rapid drop in the temperature of the Earth's atmosphere after the sunset proves that the gases found there are with a small amount of water vapor up to twenty-five per cent **[6]** do not produce a significant greenhouse effect that stops the escape of infrared radiation from greenhouse.

Table 1. Absorption of infrared radiation by a hypothetical Earth's atmosphere devoid of some components **[3]**

Absorber removed from the mixture	**Part IR absorbed**
None	100%
H_2O	64 (64, RC78)
Clouds	84 (86, RC78) –
CO_2	91 (88, RC78) -23
O_3	97 (97, RC78)
The other GHG	98
H_2O + Clouds	34
H_2O + CO_2	47
All without (H_2O + clouds)	85
All without H_2O	66 (60-70, IPCC90)
All without CO_2	26 (25, IPCC90)
All without O_3	7
All without GHG	8
All are devoid	0%

Another proof that all greenhouse gases without steam have almost no impact on global warming are the different processes of temperature change in the Earth's atmosphere at the North Pole and South Pole.

At the North Pole, which is characterized by a fast decrease of glacier cover **[7]** and an increase in the amount of water vapor **[8]**, there is a rise in temperature. The magnitude of this temperature rise varies from one source of literature item to another.

In some publications, it is said that over the last few decades, there has been an increase in average temperature at the North Pole of two degrees Celsius.

The impact of greenhouse gases on the South Pole's environment is completely different. At the South Pole, the water vapor content is negligible and amounts to 0.03% relative humidity **[9].** At the South Pole, it turns out that there is no increase in temperature when the amount of greenhouse gases increases. These data can be found in a publication by the University of Alabama based on temperature measurements at Huntsville Polar Station at the South Pole **[10]**. This data refers to temperature changes between 1980 to 2012 **[11]**. The results of the temperature measurement are shown in the attached graph **Fig.2**.

The Australian South Pole Weather station supervised by the Newmayer Institute also reports changes in the Earth's atmosphere temperature from 1980 to 2012 **[11].** The station reported a slight decrease in atmosphere temperature from 1980 to 2012 at the South Pole.

The lack of influence of the increase in the amount of greenhouse gases on the temperature of the earth's atmosphere both in deserts and in the South Pole proves that the increase in the amount of greenhouse gases that do not contain water vapor in the atmosphere has no influence on the increase in the Earth's atmosphere temperature.

Let us try to explain what causes the temperature of the Earth's atmosphere to rise at the North Pole. Temperature changes at the North Pole are certainly influenced by temperature changes in areas adjacent to the North Pole. The continuous increase of temperatures in Europe can have a particularly significant impact on temperature changes at the North Pole.

The increase in temperatures in Europe is caused by the increase in the number of housing estates and the increase in the amount of thermal energy used for industrial purposes.

"**In 2012**, on August 26, the Arctic sea ice extent reached the lowest value observed during the satellite record. Following that low, Arctic sea ice extent continued to drop, falling below 4 million square kilometers by September 5. Compared to September

conditions in the 1980's and 1990's, this represents a 45% reduction in the area of the Arctic Ocean covered by sea ice". [12] (Reference: National Snow and Ice Data Center).

Created water reservoirs around North Poland absorb significant amounts of heat and its temperature is rising. There is another factor resulting from the laws of physics. Every increase in air temperature allows to increase the amount of water vapor in the air **[13].** Steam and clouds in the Earths atmosphere are the best factors for creating the greenhouse effect in the earth's atmosphere.

So we are dealing with an increase in the greenhouse effect mainly caused by increase amount of water vapor or water vapor with clouds in atmosphere and not by carbon dioxide.

Further the importance of snowless winters in the global warming process is presented. Let us go back to the period about eighty years ago. In those years in the middle of Europe, Poland had much longer periods of cold winters. They lasted from mid-November, sometimes until the end of March. It was also cold in April, according to the Polish proverb "In April there is summer and winter".

In winter all water reservoirs were frozen and covered with a layer of snow and the ground was covered with a thick layer of snow. At the points where the snow meets the ground, the temperature never exceeds zero degrees Celsius. At very low temperatures of the Earth's atmosphere the temperature of the ground can drop to temperatures below zero.

From the stories of my ancestors I learned that at that time the earth was freezing up to half a meter deep. The snow cover began to shrink from the moment the settlements and towns where houses were built. High steep roofs enlarged and side walls of buildings increased the amount of absorbed solar energy. When there were more and more of them, the heat stored in buildings allowed to melt ice and that process was shortening the duration of winters.

In the process of industrial development and the creation of metropolitan centers, the amount of heat supplied to the earth's atmosphere has been constantly increasing. Winters were shortened and then a period of snowless winters began. In recent years nearly the whole of Europe has been dealing with almost snowless winters, with the exception of alpine areas.Let's read some of the terms for the thermodynamic imbalance of the Earth. One such term is the word ALBEDO. Albedo is the coefficient of reflection of solar energy from any surface.

Water reservoirs, water bodies reflect only three percent of the energy of the solar radiation, while 97 percent of the solar radiation is absorbed by the water bodies and water bodies become the great heat reservoirs.

The average assumed albedo of ground for calculation in that presentation is 0.3 **[14].** Another term is Solar Insolation. This can be a week of a month or a year or a quarter. It is the amount of solar energy incident per square meter of flat horizontal surface.

Previous publications concerning global warming did not take into account the huge amount of thermal energy absorbed by the earth's surface without snow cover and water reservoirs without glacial and snow cover during the current snowless winters and elevated temperatures of the Earth's atmosphere.

***Table 2**. Different factors that may have influence on global warming (m-million)*

Factor/Area	The North Pole	The South Pole	Europe	Deserts
Area	14.8 m {km^2}	14.0 m {km^2}	10.2m {km^2}	20 m {km^2}
Amount of vapour in the air	Depends on the season, clouds during some months 4% at most [9]	0.2% at most [9] No clouds	20-100%	About 25% for Sahara
Additional sources of energy and pollution around the pole	Almost all highly industrialized countries around the North Pole	No additional energy, the surrounding oceans and seas absorb nearly 100% of solar radiation energy	Very highly industrialized	
The way in which glaciers melt	From the top and bottom	From the bottom of the iceberg, where the iceberg touches the seawater and slightly from the top [10]	Almost snowless winters. The thickness of the layer of glaciers and area in the mountains are reduced	N/A
Changes of average	Rise of the North Pole	No increase for the last 30	The highest rise in	

temperatures	temperature **[10]**	years **[10]** and **[11]**	temperature	

The average albedo of the ground covered with fresh or frozen snow is 0.7 [14].

This means that with an albedo of 0.7, the amount of reflected solar energy is 70% and only 30% is absorbed on the snow surface. Part of the long-wave infrared radiation created on the earth's surface with a wavelengths in the range of 8 -14 microns is output to the space outside the earth's atmosphere through the so-called spectral atmospheric window with negligible energy losses.

During snowless winters, the Earth's surface without snow cover and water reservoirs without ice and snow covers are heated by solar energy instead of being cooled. In central Europe conditions [5] total insolation E_{in} onto the horizontal surface in December, January and February per one square meter is equal to:

E_{in} = 127326 {Wh/m^2} = 458374 {kJ/m^2}.

E_{in} - average insolation for Central Europe for three months: December, January and February.

During the whole year the quantity of heat energy supplied by the human beings is:

E_{rh} = 0.028 {W/m^2} x 4 x π x (6370000{m})^2 x 24{h/day} x 3600{s/h} x 365{day/year} = 4.5 x 10^{20} {J/year}.

0.028 {W/m^2} is power of heat energy supplied by the human beings over each square meter of the Earth **[18]**

In order to reflect heat energy E_{rh} = 4.5 x 10^{20} {J/year}, when we use reflective foils with the foil reflection coefficient of 0.8 and for assumed transmission 0.82 of reflected radiation through atmosphere, the area A_{rhf} of needed foil for reflection will be calculated from the equation below:

(A_{rhf})x(161+23) x{*W/m*^{2}}x0.8x0.82x24{h/dobę}x3600{s/h}x365{dób/rok}=4,5x10^{20}{J/rok}
A_{rhf}= 1,18x10^{11}{m^2} **[2], Fig.1**

and is equal to the area of the square with the side of 343.5 {km}.

Currently, 7.8 billions (US billions) people live on the surface of the Earth. In order to send 4.5x10^{20}Joules to intergalactic space, every citizen of the Earth should install 15.1{m2} of reflective film on the surface of the Earth.

A_{rhf} Area of a reflective foil needed to derive heat from human activities on Earth within one year. A_{rhf} area = $1{,}18x10^{11}\{m^2\}$ would require reflective surfaces with an area equivalent to the surface of the roofs on approximately 1.2bn homes with the surface of the ceilings mounting to 100 $\{m^2\}$ on average. Assuming that the cost of painting of one square meter is 5 USD , the sum would amount to USD 590 billions.

In addition to the roofs of houses, we can use: modified side walls, tilting windows, car and train roofs, surfaces between railway rails, road surfaces, reflective surfaces with a fixed position and adjustable angle to the direction of solar radiation [19].

Let us also calculate the area of snow which will remove the quantity of energy E_{rh} = 4.5×10^{20} {J/year} into the intergalactic space during three winter months.

$A_{rhs} x\ 458374\ kJ/m^{2x} = 4.5 \times 10^{20}$ {J/year}.

A_{rhs} reflection area for removing heat from human activities using snow

$A_{rhs} = 9.8x10^{11}\ m^2 = 9.8x10^5\ \{km\}^2$ = about one million sq. kilometers and it responds area of a square with the side of 991 {km}.

Let us calculate the quantity of heat energy E_{rt} accumulated by the Earth as a result of the lack of the thermodynamic equilibrium during the entire year.

As written at [2] "the climatic system is not at in the state of thermodynamic equilibrium: each square meter of our planet accumulates 0.9J of energy on average in each second". For the whole year our planet accumulates:

E_{nrt} = 0.9 $[W/m^2]$ x 4 x 3.14 x $(6370000m)^2$x 24hx3600s/24 hours x 365 days/year $E_{nrt}=1.5x10^{22}$J/year.

E_{nrt} is the energy of the thermodynamic imbalance of the Earth for one year.

For the purposes of further analysis, we will find the size of the area covered by snow which will lead to obtaining the full thermodynamic equilibrium.

A_{st} x458374{kJ/m^2x1000 J/m^2= A_{snow} x458374000 J/m^2=$1.5x10^{22}${J/year}

$A_{st}=3.3x10^{13}\{ m^2/year\} = 33\ \{m\ (km)^2/year\}$

In order to obtain the full thermodynamic equilibrium, i.e. to remove 1.5×10^{22} {J/year} (when we assume the average insolation typical to the center of Europe), we need to add an additional surface totally covered with snow of 33 {m km^2/year}. That area is smaller when we take into account longer periods of being covered by snow.

There are some chances to cover the necessary surface of the Earth with snow in order to reverse the process of global warming of the climate. This method involves the mounting of reflective surfaces on the terrains where the snow usually remains for short periods. The terrains where snow remains for shorter periods are the best choice. These include mountain areas and the terrains next to the mountains. It is known that each square meter of foil reflects 48W/m^2 on average in winter in the Center of Europe during three winter months conditions. This is the power which restores thermodynamic equilibrium on the area of 53 m^2. This figures suggest the possibility of existence of positive feedback in acquiring additional areas covered by snow.

If the glaciers on the South Pole and other glaciers disappear, there is a danger that the level of ocean waters will rise by more than 70 meters.

For the removal of solar energy from Earth into interstellar space can be additionally used painted with reflective paints: car roofs, surfaces between railway rails, road surfaces, any reflective surfaces with a fixed position or adjustable angle of incedation in relation to the direction of solar radiation attached to the walls of building, columns and trees [1].

Now let's find the area A_x covered with snow that will restore the thermodynamic balance of the Earth for the following terms: three months of occurrence of snow and the average solar insolation typical for center of Europe in winter time. A_x means the size of the desired snow-covered area.

458374[kJ/m²] x A_x [km^2]=1,5x10^{22} [J]
A_x= 32.7 mln [km^2]

According to my observations, a significant decrease in the period of snowy weather all over the Earth occurred in the seventies of century. After reviewing the available snow surface reduction maps for all the different quotas, I accepted the following data:

1. The snow cover of Europe has decreased by. - 7 millions km^2,
2. The area of the former Soviet Union is lowered by 12 millions km^2,
3. China, Japan, Korea and Himalaya together - 3 millions km^2,
4. part of the North Pole and adjacent sea basins 6 millions km^2,
5. the United States and Canada - 4 millions km^2,
6. Lands in the South America – 2 millions km^2

In total, it gives an area of 34 millions km^2. This 34 millions km^2 corresponds to the calculated area A_x = 32.7 millions km^2 that will restore snow that will restore the thermodynamic imbalance balance of the Earth. Two years ago there were shown the ski slopes on the Europe News television showing Alps only partially covered with snow. These images are showing the horror of the situation that the Alps will soon be free of snow. If this happens, the globe will get a huge snow-free areas, which will absorb huge amounts of additional heat causing an increase of thermodynamic imbalance. We would be dealing then with a faster increase in snow melting and increase of glacier melting rates at the North Pole. These processes should have caused a rapid increase in the temperature of the Earth's atmosphere..The increasing size of the snow-free surface causes an increase in absorbed solar energy by the Earth's surface, which again accelerates the melting of glaciers. This is a process with positive feedback such as in nuclear reactions. What could we expect from this process in the near future:

- Total melting of high mountain glaciers. This process will enlarge the snow-free area and will provide additional solar energy each year.
- The total melting of glaciers in the North Pole and then the melting of glaciers in the Antarctic, that is, in the South Pole.

In Antarctica and Greenland there are 99 percent of clean drinking water on Earth. These data come from the National Snow and Ice Data Center of the University of Colorado, USA. Melting of Antarctic ice will increase water levels in the oceans by 60 meters. Melting of the glacier in Greenland will increase the water level in the oceans by further 6 meters.

After melting all the glaciers, we will have new water bodies, which will absorb 97 percent of the incoming solar radiation and at the same time we will be deprived of the reflective surfaces that were previously glaciers. This fact will cause an even faster increase in the temperature of the Earth's atmosphere. This increase in temperature will threaten the existence of life on the Earth's surface at some time.

It might simply not be possible to stop this process due to the absorption of huge amounts of solar energy through enlarged water reservoirs and no reflection of solar radiation by glaciers.

All of the above energy calculations are based on 2009 data [2]. At present, the data is probably different. In particular, with regard to the thermodynamic imbalance value for one square metre of 0.9{W/m2}.

The calculations did not take into account the transport of thermal energy by infrared radiation, taking into account the escape of heat as infrared radiation through the atmospheric window between wavelengths from 7.6 micrometers to 14 micrometers.

Shown study proves that the cause of global warming is not carbon dioxide. The reason is "Human activity causing an increase in the size of the Earth's snowless area". I sent this study to many institutions: several times to: the Ministry of the Environment in Poland, the Swedish Nobel Prize Committee, the Swedish Academy of Sciences, to Swedish King, to the management of the Climate Conference in Paris 2015, eight scientific centers specialized in global warming worldwide, the UN and some presidents.

At the COP 24 Conference in Katowice I handed over a copy of my study on climate issues to the Deputy Secretary-General of the United Nations, who promised to read the text and respond to my document

I asked all of them to assess the correctness of my analysis on global warming and I received a a thanks letter from President D. Trump.

Polish President A. Duda recommended me to apply for evaluation in the Ministry of Education .

In Poland I found two physics university professors who agreed with my study. One of them stated: The text is scientifically correct but politically incorrect. Both of them withdrew from the scientific support to me.

Is it possible to eliminate the thermodynamic imbalance of our planet by using reflective surfaces?

Each square metre of reflective surface with albedo 0.8 and coefficient of transmission of reflected radiation through atmosphere 0.82 can on average restore a thermodynamic balance for surface 117.3 $\{m^2\}$. **[Fig.1]**

$A_r = 161\{W/(m^2)\} \times 0.8 \times 0.82/0.9\{W/m^2\} = 117.3\ \{m^2\}$.

By selecting the optimal geographical location of the reflective layers, it is possible to create a positive feedback loop in the restoration of snowy surfaces.

There is also possible application of shocking therapy for a restoration of snowy surfaces. This shock therapy of restoring thermodynamic equilibrium is to consist in simultaneously huge reducing the consumption of heat energy worldwide in a favorable climatic period to cause snowfalls.

The current system of accounting for countries for the amount of carbon dioxide produced should be replaced by accounting for the amount of thermodynamic imbalance produced. On a micro scale, there should be such numerous industrial plants, offices and even families.

From my observations of the distribution of temperatures on Earth, it was clear that there was a slowdown in the rise in the temperature of the Earth's atmosphere in 2019 and 2020y.

Chicago 2020-07-05

Supplement to the above elaboration below.

From the basic knowledge of physics contained in the above elaboration it follows that with the increase in the size of the Earth's snowless surface, the amount of the solar energy absorbed by the Earth's surface increases and thus should correspond to the increase in temperature of the Earth's atmosphere.

Two years ago, there was a huge increase in the size of snowless area in the Alps and I in the North Pole. Probably a similar process occurred in other mountain massifs. From my observations of temperature changes on maps I noticed stabilization and even decrease of average temperatures during the summer and winter in last years

I have come to the conclusion that there must be some other process that counteracts the rise in the Earth's atmosphere temperature. The only reason that could turn back or slow down the process of the Earth's atmosphere temperature rise could be the decrease of the solar energy reaching the Earth from the Sun. My searches went in this direction.

I found that: since 2014 (as interpreted by the authors of the article) we have been dealing with a continuous process of decreasing the amount of solar energy reaching the Earth from the Sun.

I also found an article informing that there is a predicted period of a small ice age, such as we had in the 17th century in Europe. From Poland to Sweden you used to ride a sleigh. The Swedish army then crossed the Baltic Sea and conquered the Netherlands.

Climatologists **[20]** assume that the period of a small cold era began in 2012 and will last for thirty years. Farewell to global warming.

The ppzn.fc.pl website **[21]** contains a more detailed description of the global warming process. I was lucky in 2009 to find information on the Internet that a giant tsunami flew over the surface of the Sun visible from the Earth. No reason for this phenomenon was given. One can guess that the Sun from the invisible side was hit by some heavy object.

Recapitulation.

The presented solutions in [1], [19] and [21] allow for:

1. Temperature regulation of the Earth's atmosphere.
2. Adjusting the amount of rain.
3. Snowfall regulation.
4. Reducing the heating of building houses with solar radiation during the summer.

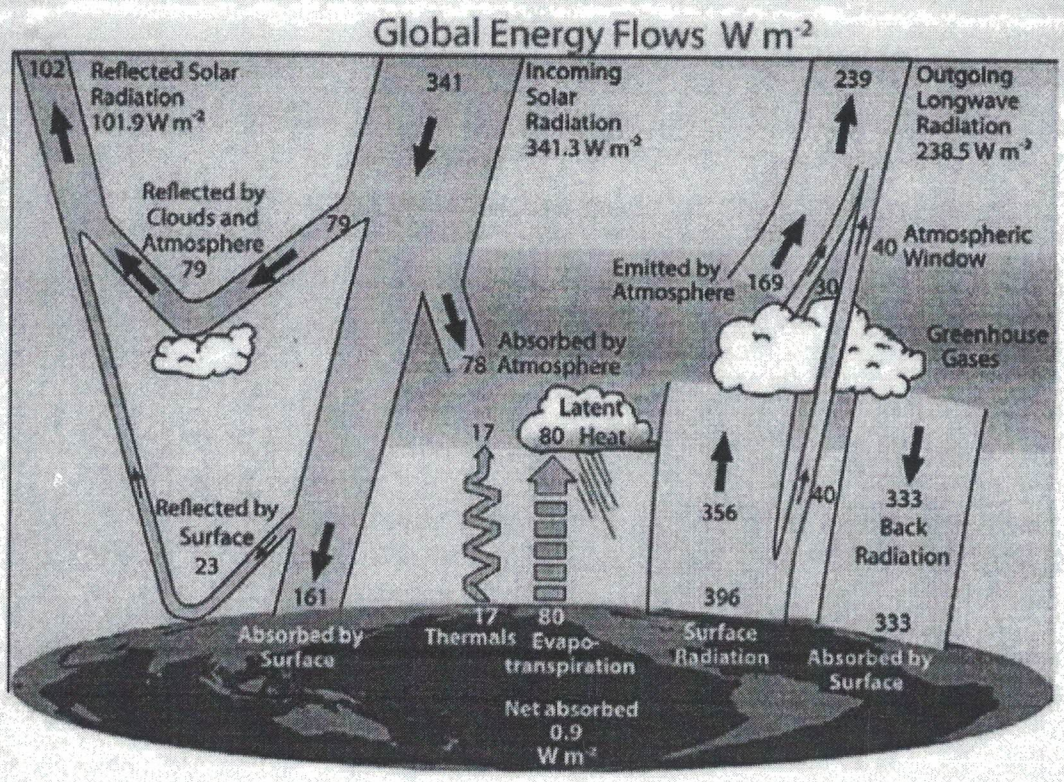

FIG. 1. The global annual mean Earth's energy budget for the Mar 2000 to May 2004 period (W m^{-2}). The broad arrows indicate the schematic flow of energy in proportion to their importance.

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Fig.1. Taken from [18].

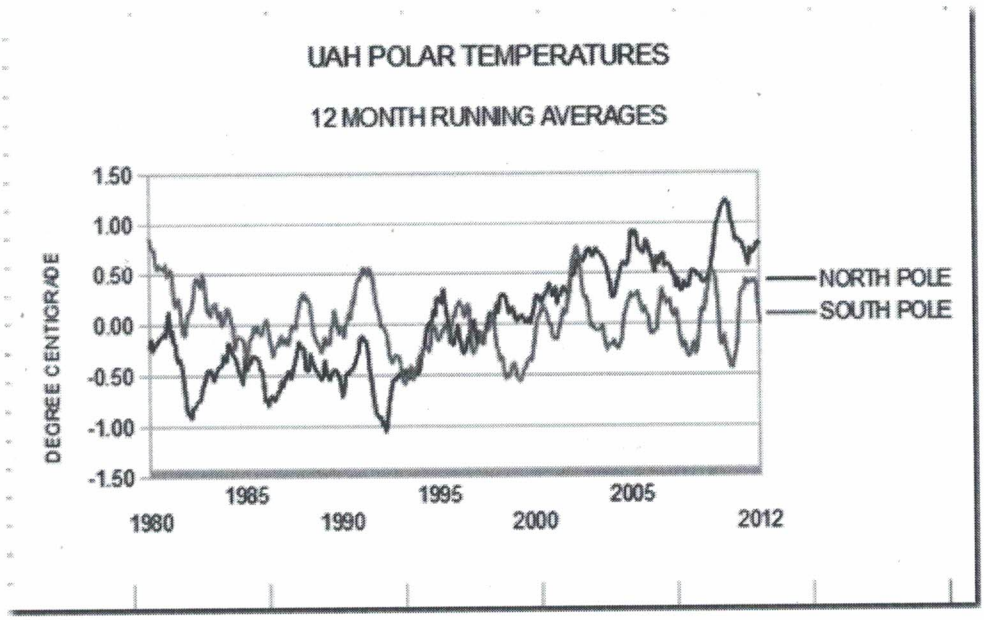


FIG.2. 12 MONTH RUNNING AVERAGES TEMPERATURES FOR THE NORTH POLE AND SOUTH POLE BY The University of Alabama in Huntsville Polar Temperatures 1980-2012

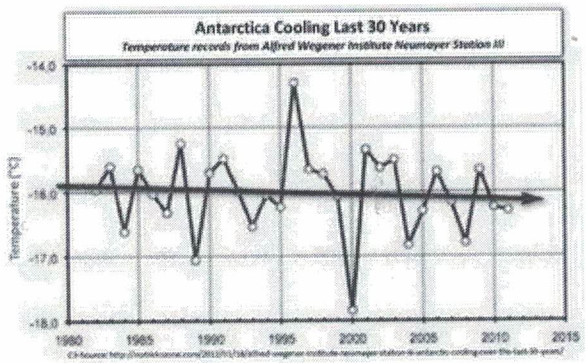
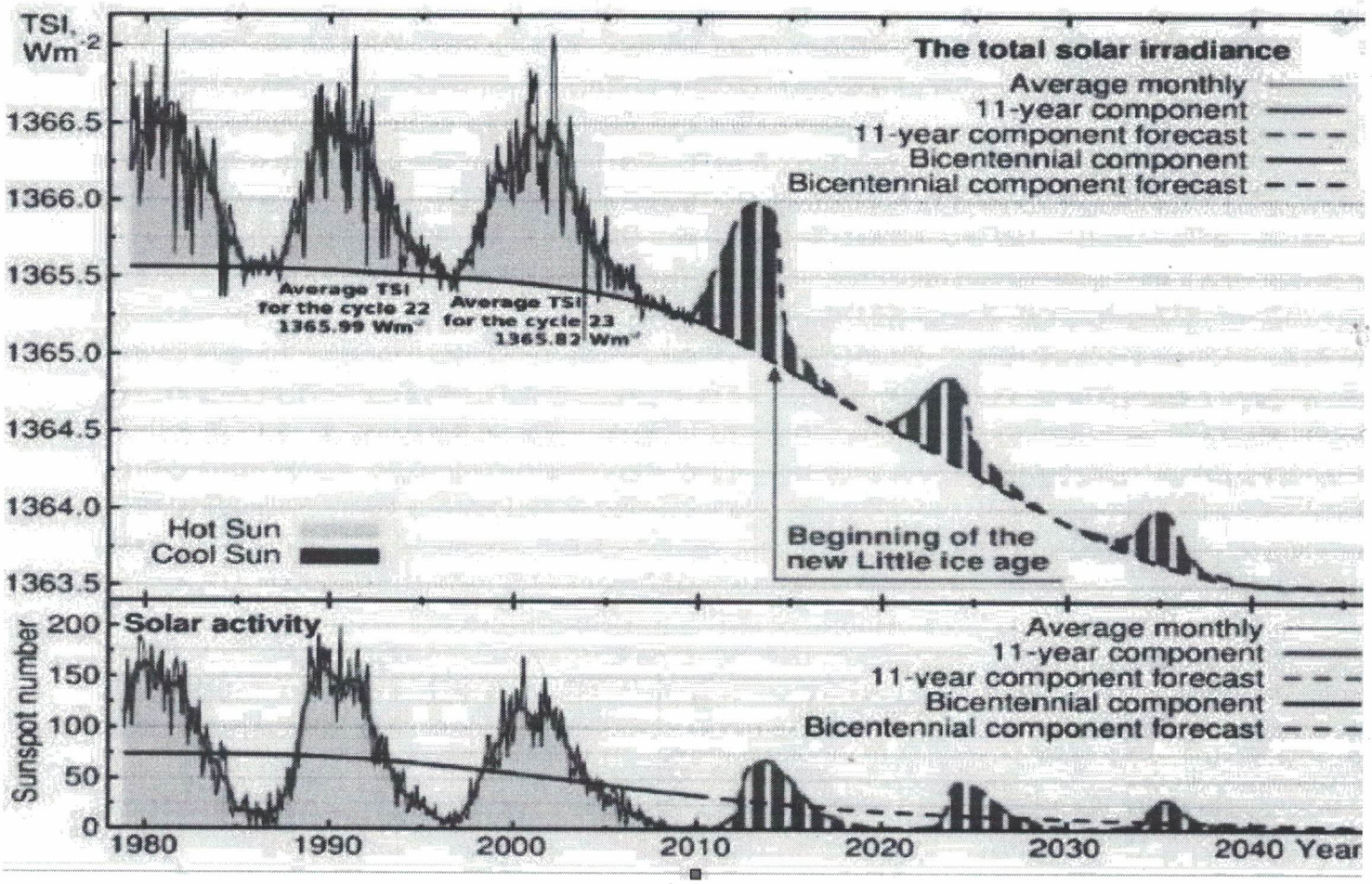


Fig.3 . TEMPERATURE RECORDS FROM ANTARCTIC STATION III OF ALFRED WEGENER INSTITUTE IN NEUMAYER FOR THE LAS 30 YEARS



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Sincerely,

Adam Bednarczyk