

STOPPING THE RUNAWAY CLIMATE OF THE NORTHERN HEMISPHERE IS NOW POSSIBLE THANKS TO ITS ARCTIC POLAR VORTEX,

With the Montreal Protocol in 1987, the STATES unanimously banned the use of chlorofluorocarbons (CFCs) in everyday objects that destroy the ozone layer. And the hole in this layer began to fill in as early as 1990. We have a problem of the same type to solve, but for the moment there is no unanimity on the cause(s) of runaway climate change. For the past two years, Google research on global warming has been asking *"why do we need to remove these contrails from airliners?"* This is the first time that researchers have been concerned about stratospheric water vapour, a greenhouse gas that is more important than carbon dioxide.

1-THE NASA/GISS/GISTEMP V4 CURVE, reveals THE RUNAWAY CLIMATE limited to the northern hemisphere, and gives the temperature variation of the two hemispheres from 1880 to 2025 cf pages 6 and 7.

1880-1910, over the period there is COOLING of the planet but the southern hemisphere is less cold than the northern hemisphere. The major climatic event of this period, on August 27, 1883, occurred the explosion of the Krakatoa volcano in Indonesia (Latitude 6° South) which was characterized by fiery clouds and a volume of ash emitted into the atmosphere of 20 km³. These ashes will cool the world climate for a

period of 4 years from 1883 to 1887 like any terrestrial volcano explosion, the temperature drop that can be measured on this curve is 0.23°C.

1910-1966, over the period carbon dioxide CO₂, a greenhouse gas emitted by human activities using fossil fuels (coal, gas and oil) is the driving force behind the initial GLOBAL WARMING that can be dated back to 1910.

The major historical event was the First World War of 1914-1918, which caused the world thermometer to rise by 0.3°C. From 1922 onwards, the Northern Hemisphere was warmer than the Southern Hemisphere.

1966-1990, during this period the Southern Hemisphere is warmer than the Northern Hemisphere but the difference is insignificant.

1990-2025, sees the CLIMATE RUNAWAY of the Northern Hemisphere (see pages 6 and 7) take off in 2005 on a parabolic trajectory while the Southern Hemisphere continues on its linear trajectory. This very marked difference in trajectory clearly indicates that another greenhouse gas is to blame. Carbon dioxide CO₂ is not responsible for this runaway climate, which is only located in the Northern Hemisphere and the decarbonization of human activities is insufficient to stop it. We are beginning to read that carbon neutrality is impossible to achieve in 2050 (VACLAV SMIL latest book: 2050, Why a carbon-free world is almost impossible). In the northern hemisphere, the war in UKRAINE is causing the thermometer to rise by 0.22°C.

On the temperature record (page 16) we see that the ARCTIC Ocean in winter (January, February, March) since 2005 is irreversibly overheating. Before 2005 there is no overheating (t°C between -0.6° and 0.3° but for TWENTY-ONE years this overheating is

very abnormal between 2.1° and 7° . It is untenable, it is absolutely necessary to stop the runaway ARCTIC which conditions the climate of the NORTHERN HEMISPHERE.

But on January 15, 2022, the major climatic event of the contemporary period was the explosion of the Honga Tonga submarine volcano in the Central Pacific of the Southern Hemisphere. The volume of ash sent into the stratosphere up to 58 km altitude is 6.5 Km³, much less than for Krakatoa 20 Km³, the only difference, being an underwater volcano, is that 140 MILLION TONS OF WATER VAPOR were also propelled into the stratosphere.

Scientists expected the climate to cool down as with the Krakatoa explosion, but the opposite has happened. The Southern Hemisphere has warmed abruptly by $+0.23^{\circ}\text{C}$ (page 6), which is TWENTY times more than its historical average, and the melting of the extent of the Antarctic sea ice has been phenomenal (see table on page 13). And this exceptional warming of the Southern Hemisphere's climate between 1.25° and 3.5° from 2022 to 2025, due to stratospheric water vapour, will last for 4 to 5 years, i.e. more than 1500 days, because this water vapour is not eliminated in 10 days as in the lower troposphere when it falls as rain. Stratospheric water vapour is transported by atmospheric currents to the poles, north or south, and it is the polar vortex that eliminates it, and only during the three months of winter (see page 16). Its lifespan is unknown but can reach or even exceed 1500 days. When the extent of the Antarctic sea ice will have returned to an average value of the years 2015-2021, which is expected after the austral winter of 2026 (July, August and September). And this is what will give us the exact value of this lifespan of the water vapor that man deposits in the stratosphere.

The only human activity that deposits water vapour, 300 million tonnes in the stratosphere between 10 and 13 km above sea level, is Air Transport. The very significant proportions are 93% of flights in the Northern Hemisphere and only 7% in the Southern Hemisphere.

This is the cause of the runaway climate of the Northern Hemisphere. Every year in the Northern Hemisphere, the deposition of water vapor from high-altitude jet aircraft is more than TWICE that injected by the explosion of the Hunga Tonga. This is untenable and making the trails disappear is insufficient.

The only solution to make this water vapor neutral for the climate is to IMPERATIVELY limit the cruising level of World Air Transport to less than 8000 meters in the northern hemisphere between 40° and 90° north latitude. And between 40° South and 40° North limit the cruising level in the troposphere to less than 11000 meters.

In this way, runaway warming will be stopped and global warming in the northern hemisphere will be brought back to the level of the southern hemisphere +0.8°C (ref 1951-1980) at the end of 2027 or at the latest in 2030, by gently decarbonizing human activities without disrupting economic growth.

2-WATER VAPOR,

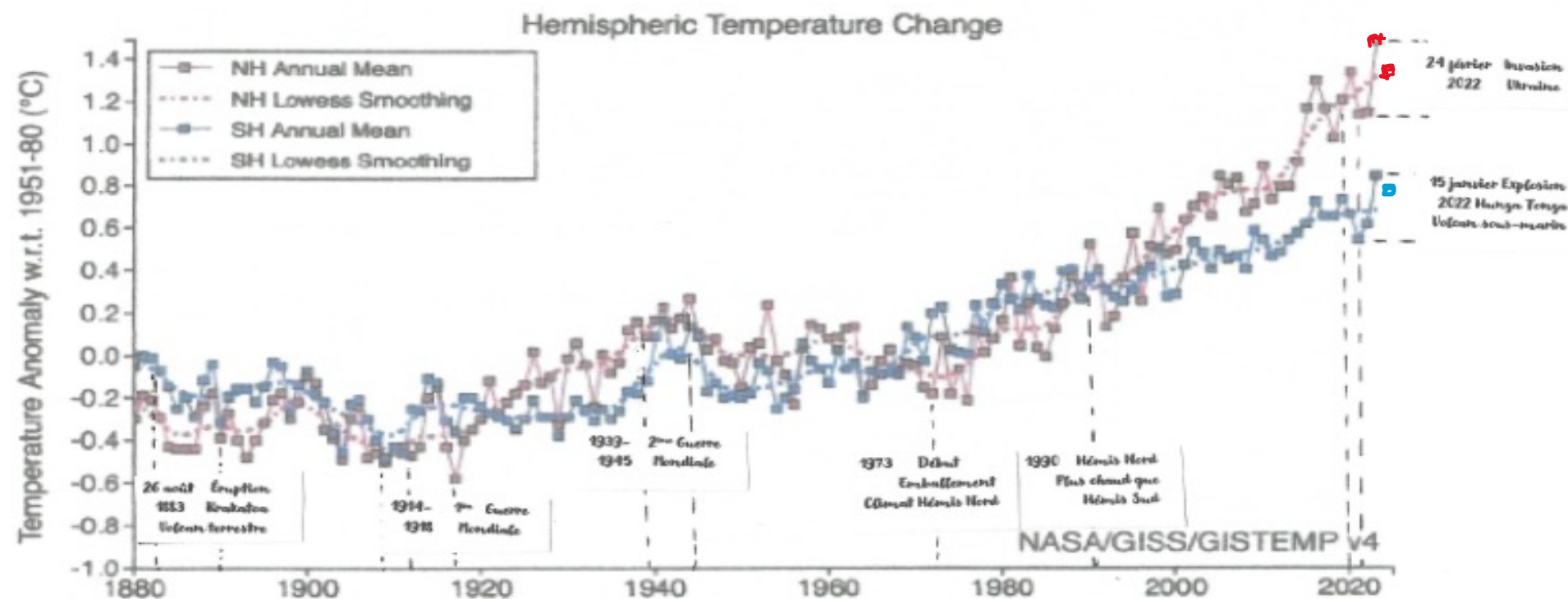
We have to face the facts, it is the most important greenhouse gas that accelerates global warming. It is also the one that amplifies violent and destructive weather phenomena. If decarbonization is ineffective, there is an urgent need to dehydrate the atmosphere A LOT.

The figures speak for themselves, the century-old variation between 1922 and 2022 in CO2 (26% contribution to the greenhouse effect) is 759 billion T, that of Water Vapor (60% contribution to the greenhouse effect) over the same period is 939.4 billion T, i.e. 180 billion T.

Subsequently, to reduce the frequency and intensity of hurricanes, it is therefore necessary to reduce the amount of water vapor produced by the evaporation of the oceans (North Atlantic, South Indian and Central Pacific) by implementing my EUROPEAN PATENT by installing PIU stations around certain tropical islands.

Filed in August 2019, the patent was granted on April 3, 2024 by the European Office in Munich, which incorporated the lessons learned from the climatic events that occurred over the period 2019-2024.

The halt of Global Air Transport in December 2019 and 2020 following the COVID 19 epidemic, the suppression of the overflight of the Arctic Ocean with the war in Ukraine and the explosion of the submarine volcano, these three events have revealed the preponderant and unique influence of stratospheric water vapor in climate runaway.



Annual and five-year lowess smooth anomalies (vs. 1951-1980) separately for the Northern and Southern Hemispheres based on land and ocean data.

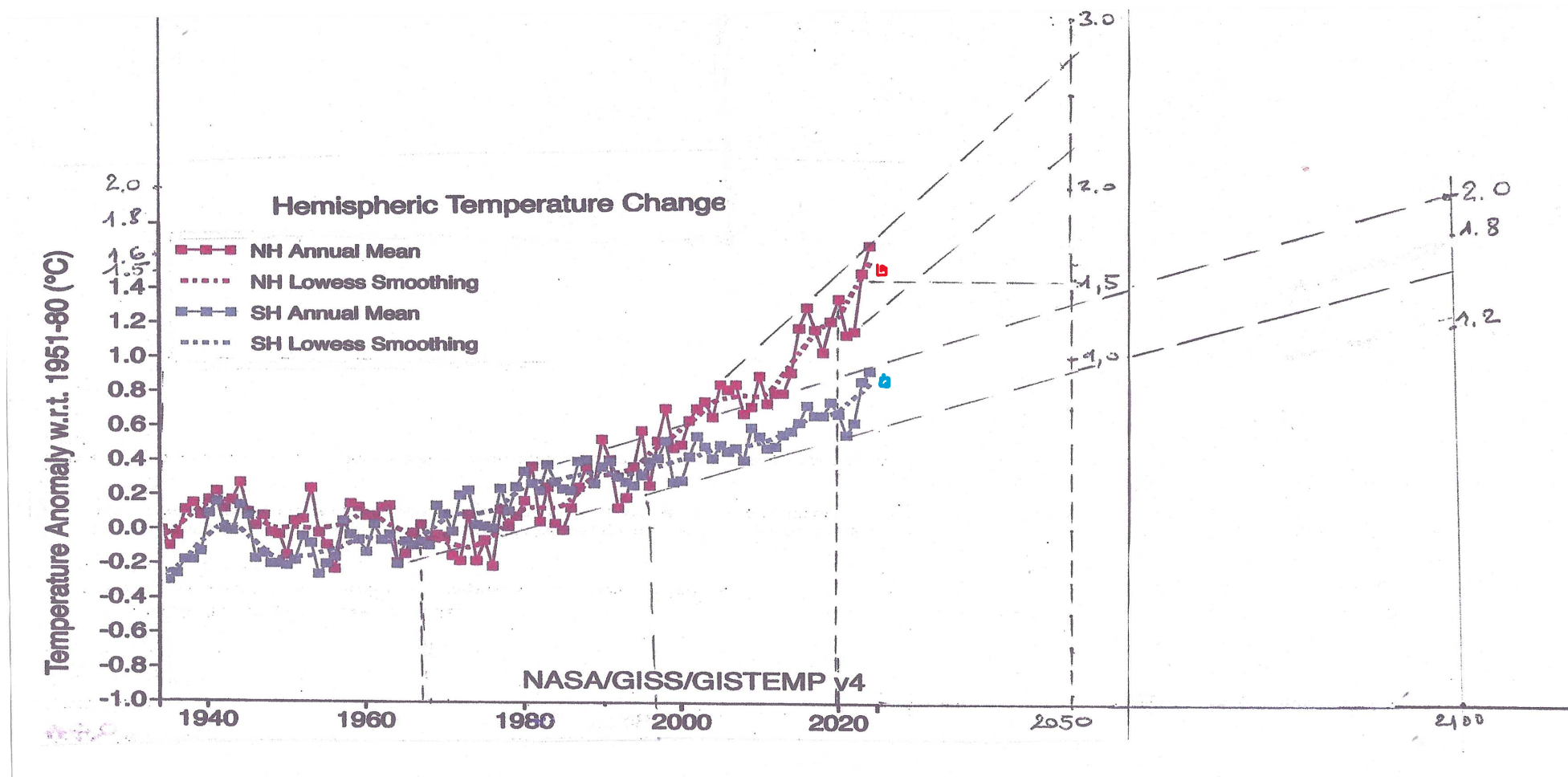
Figure also available as a [PNG](#), [PDF](#), [HTML](#), [plain text](#) and [CSV](#) (data columns 2, 3), or [Generate PNG](#) of the visualization's current state.

[Global Monthly Mean Surface Temperature Change](#)

[Annual Mean Temperature Change in the United States](#)

[Seasonal Mean Temperature Change](#)

A-2100 PROJECTION OF SOUTHERN HEMISPHERE TEMPERATURE CHANGE THAT RESPECTS THE 2015 COP



B-RECORDS OF VARIATIONS IN GLOBAL AIR TEMPERATURE COMPARED TO THE PRE-INDUSTRIAL PERIOD 1880-1900

The monthly temperature variations recorded by NASA from January 2021 onwards have been reconstructed (reference 1880-1900) to compare them since the explosion of Hunga Tonga on January 15, 2022.

Because it is the explosion of this underwater volcano that revealed this water vapor amplifying phenomenon, from 1.13° in January 2021 to 1.72° in February 2024 in 3 years which can be stopped by our solution after more than 1500 DAYS, by limiting the cruising altitude of World Air Transport.

NOTES:

1-Over the period 1997-2021, the development of World Air Transport shows that temperature variations depend on the deposition of water vapor produced by the combustion of kerosene in the stratosphere.

2-The annual variation is 0.61° in 1999 and 1.47° in 2024, i.e. an acceleration of 0.86° in 25 years for an average growth of 0.48° in 99 years from 1900 to 1999. The culprit is indeed stratospheric water vapour.

- Monthly averages of NASA temperature changes from 2001 to 2026

compared to the pre-industrial period 1880-1900

	2021	2022	2023	2024	2025	2026
<i>January</i>	1,13°	1,24°	1,24°	1,62°	1,69°	1,37°
<i>February</i>	0,95°	1,13°	1,22°	1,72°	1,51°	1,49°
<i>March</i>	1,08°	1,22°	1,42°	1,61°	1,60°	1,47°
<i>April</i>	1,04°	1,05°	1,11°	1,54°	1,44°	1,38°
<i>May</i>	0,99°	0,98°	1,17°	1,32°	1,23°	1,29°
<i>June</i>	1,11°	1,06°	1,25°	1,40°	1,19°	1,42°
<i>July</i>	1,02°	0,99°	1,33°	1,28°	1,18°	
<i>August</i>	1,03°	1,07°	1,45°	1,34°	1,21°	
<i>September</i>	1,00°	1,07°	1,44°	1,38°	1,28°	
<i>October</i>	1,06°	1,07°	1,49°	1,42°	1,22°	
<i>November</i>	1,12°	1,02°	1,62°	1,56°	1,36°	
<i>December</i>	1,05°	1,01°	1,56°	1,48°	1,27°	
 NASA						
<i>Avg/year</i>	1,03°	1,07°	1,36°	1,47°	1,35°	

Arctic sea ice extent from 2005 to 2026-

Since the annual low in 2020 of 10.15 million Km², the Arctic sea ice is recovering in 2021 by the cessation of the deposition of water vapor produced by the overflight of the Arctic Ocean to serve the Far East following the covid 19 pandemic.

But the outbreak of the war in Ukraine in February 2022 is once again increasing the melting of the sea ice. In 2023 and 2024, its extent will return to its 2007 value. In 2025, it will return to its 2016 value.

	Janu	Febru	March	April	May	June	July	Augu	Septe	Octob	Novem	Decem	Annual
2005	13.66	14.37	14.69	14.09	12.91	11.16	8.649	6.301	5.504	7.352	10.22	12.23	10.907
2006	13.47	14.33	14.42	13.91	12.52	10.92	8.46	6.496	5.862	7.541	9.659	11.96	10.773
2007	13.7	14.51	14.54	13.85	12.78	11.22	7.943	5.342	4.267	6.04	9.76	12.03	10.474
2008	13.89	14.95	15.18	14.35	12.97	11.21	8.678	5.913	4.687	7.35	10.34	12.36	10.978
2009	13.91	14.81	14.98	14.5	13.19	11.32	8.465	6.136	5.262	6.92	9.772	12.2	10.932
2010	13.74	14.58	15.14	14.66	12.87	10.59	8.075	5.875	4.865	6.984	9.614	11.83	10.711
2011	13.46	14.36	14.55	14.11	12.68	10.75	7.724	5.503	4.561	6.465	9.772	12.15	10.483
2012	13.73	14.55	15.2	14.63	13.01	10.67	7.672	4.723	3.566	5.886	9.388	12.01	10.406
2013	13.7	14.72	15.03	14.3	13	11.36	8.132	6.014	5.208	7.455	9.939	12.18	10.897
2014	13.65	14.42	14.76	14.09	12.7	11.03	8.108	6.078	5.22	7.232	10.12	12.35	10.79
2015	13.6	14.4	14.37	13.89	12.47	10.88	8.378	5.599	4.616	6.966	9.846	12.05	10.566
2016	13.46	14.2	14.4	13.68	11.92	10.41	7.938	5.371	4.528	6.082	8.658	11.46	10.163
2017	13.19	14.12	14.29	13.75	12.63	10.76	7.939	5.481	4.822	6.767	9.493	11.74	10.393
2018	13.08	13.97	14.3	13.7	12.23	10.78	8.268	5.615	4.785	6.134	9.823	11.86	10.355
2019	13.57	14.39	14.57	13.43	12.19	10.59	7.589	5.026	4.364	5.735	9.353	11.9	10.201
2020	13.64	14.64	14.73	13.62	12.34	10.59	7.294	5.07	4.001	5.334	8.985	11.73	10.15
2021	13.5	14.39	14.66	13.79	12.68	10.77	7.647	5.715	4.952	6.816	9.83	12.15	10.552
2022	13.87	14.61	14.59	13.99	12.88	10.88	8.287	5.95	4.897	6.657	9.725	11.89	10.661
2023	13.36	14.19	14.43	13.92	12.82	10.99	8.207	5.514	4.381	6.412	9.682	11.98	10.469
2024	13.92	14.61	14.87	14.04	12.74	10.85	7.87	5.13	4.351	5.934	9.146	11.41	10.391
2025	13.11	13.75	14.12	13.83	12.49	10.41	7.66	5.413	4.747	6.317	8.775	11.22	10.130
2026	13.11	14,098	14,131	13,568	12,14	10,422							

Antarctic sea ice extent from 2005 to 2026.

Between 2005 and 2021, fluctuations around 11.5 million Km² but since the explosion on 15/02/2022 of the submarine volcano HUNGA TONGA, there has been an accelerated melting and a sudden decrease in this area of more than 1 million Km² (-7.5% in 2022 and -15% in 2023) and a very marked warming of the southern hemisphere which is not linked to CO₂ but to the 140 million tons of water vapor propelled into the stratosphere.

Antarctic sea ice in 2023 reached its annual low of 9.931 million km² and is gradually recovering. In 2024, it has recovered 530,000 km² and in 2025, it has recovered 732,000 km² compared to the 2023 low.

In 2025, the sea ice will return to its 2020 and 2017 extent and is on track to return to its historical average of between 11 and 12 million km².

	Janu	Febru	March	April	May	June	July	August	Septem	Octob	Novem	Decem		Annual
2005	4.752	2.97	4.082	7.032	10.29	13.29	16.16	17.92	18.81	18.48	16.32	9.68		11.695
2006	4.164	2.651	3.215	6.01	9.456	13.35	16.11	18.1	19.09	18.73	16.23	9.854		11.461
2007	4.673	2.905	3.835	6.418	9.648	13.29	15.96	17.68	18.86	18.51	15.89	11.98		11.687
2008	6.414	3.895	5.284	8.242	11.05	14.06	16.1	17.65	18.15	17.99	16.25	11.51		12.239
2009	5.707	2.991	4.441	7.798	10.93	13.91	16.26	18.1	18.96	18.3	15.85	10.74		12.049
2010	4.958	3.106	3.847	6.715	10.64	14.41	16.92	18.61	18.8	18.65	16.76	11.27		12.107
2011	4.512	2.519	3.368	6.097	10.09	13.33	15.75	17.81	18.74	18.22	15.76	11.2		11.501
2012	5.654	3.553	4.55	7.309	10.46	13.55	16.3	18.1	19.21	18.59	16.11	10.39		12.004
2013	5.543	3.836	5.017	7.623	10.92	14.16	16.81	18.66	19.39	19.02	16.87	11.85		12.524
2014	6.327	3.843	4.901	8.343	11.52	14.69	17.11	18.91	19.76	19	16.39	11.93		12.776
2015	6.852	3.799	4.964	8.373	11.72	14.48	16.78	17.75	18.44	18.41	16.18	10.66		12.414
2016	4.689	2.79	4.069	7.222	10.1	13.24	16.02	17.89	18.15	17.46	14.22	8.279		11.202
2017	3.784	2.288	2.699	5.436	9.014	12.41	15.3	17.22	17.91	17.78	15.11	9.482		10.749
2018	4.211	2.326	3.54	6.033	9.321	12.89	15.7	17.42	17.96	17.73	15.1	9.188		11
2019	3.868	2.655	3.169	5.718	8.852	12.25	15.3	17.48	18.34	17.94	15	9.409		10.876
2020	4.598	2.92	4.003	6.662	9.871	13.28	15.72	17.76	18.84	18.49	16.23	10.58		11.602
2021	4.777	2.892	4.484	7.132	10.4	13.54	16.45	18.19	18.51	17.69	15.04	9.245		11.579
2022	3.935	2.213	2.859	5.948	9.418	12.22	14.99	17.05	18.06	17.47	15.16	8.839		10.726
2023	3.296	1.978	2.838	5.538	8.447	11.12	13.57	15.58	16.89	16.28	14.38	8.765		9.931
2024	4.047	2.187	3.221	6.253	9.363	11.85	14.2	16.41	17.15	16.65	14.31	9.593		10.461
2025	4.693	2.218	3.002	6.173	9.273	12.11	14.67	16.5	17.64	16.97	14.58	9.219		10.663
2026	4.492	2,912	3,568	6,178	9,345	12,332								

3-THE POLAR VORTEX,

The polar vortex is an upper-level depression located in the upper troposphere and stratosphere. The cyclone rotation in the northern hemisphere is counterclockwise while in the southern hemisphere it is clockwise.

The polar vortex intensifies in winter and weakens in summer because it depends on the thermal difference between the equator and the poles.

In other words, the intensification and decline of the polar vortex is driven by the movement of stratospheric air masses that transfer heat from the equator to the poles.

It is also noted that these polar vortices are also animated by a downward movement from the stratosphere to the middle troposphere.

And it is thanks to this downward movement that **water vapour can then be evacuated from the stratosphere and only at the poles and in winter when the polar vortex reaches its maximum intensity.**

In Antarctica, on the record of temperatures in winter (July, August and September) we see that in 2020 and 2021 the normal temperature is close to zero or negative around -1° . While after **the explosion of the Hunga Tonga underwater volcano on January 15, 2022, which sent 140 million tons of water vapor into the stratosphere of the southern hemisphere**, there is a **sharp warming compared to the previous year**. There was $+2.2^{\circ}\text{C}$ at the South Pole in the 1st quarter of 2022 with a maximum of 0.94°C for the hemisphere. This deviation from the South Pole is 1.57° in 2023. This gap rises to 2.3° in 2024 and 3.7° in 2025. MORE THAN 1000 days after the explosion, the water vapor injected into the stratosphere has not been completely evacuated and the Polar Vortex is playing its role but with fluctuations.

Below on the last page has been reconstructed a table of the

Surface temperatures of the two polar vortices in winter, spring, summer, autumn

Thanks to the GISS NASA GLOBAL TEMPERATURE (GISTEMP v4) readings by clicking on World Maps, with a choice of temperature reference 1951-1980. I just add $+0.21^{\circ}\text{C}$ to these differences to directly find the temperature differences compared to the reference of the pre-industrial period 1880-1900. HN= Northern Hemisphere. HS= Southern Hemisphere.

NASA, due to a lack of federal budget, no longer updated its site, which was very unfortunate for the follow-up, but fortunately since November 14, 2025 it has resumed its updates. The Antarctic sea ice seems to be on the right track to return to normal, we have to wait for the next surveys to see this.

The lifespan of water vapor in the lower troposphere is only 10 days and then falls back as rain. **The lifespan of water vapor in the stratosphere is of the order of more than 1500 days, or ONE HUNDRED FIFTY times more** and only evacuating through the polar vortex in winter, **it is the main cause of the planet's runaway climate.**

This is what we have seen in the ARCTIC, with a virtual blockage and maximum and abnormally high temperature differences at the North Pole since 2005. The last year with negative temperature differences is 2004, in other words the polar vortex played its role fully until the beginning of 2005 and then it was insufficient to evacuate all the stratospheric water vapor. There are five more or less normal years with deviations of less than 3.6° at the North Pole, and include the two covid years 2019 ($+3.3^{\circ}$) and 2020 ($+3.2^{\circ}$), which saw the halt of global air transport. Since 2005, there have been fifteen years with a runaway Arctic climate equal to or greater than 4°C . The records are in 2016 with $+7^{\circ}$, in 2025 $+6.5^{\circ}$ followed by $+6^{\circ}$ in 2011 and 2018 then 2023 with $+5.8^{\circ}$ and 2021 with 5.5° .

ACTING FOR THE ARCTIC MEANS ACTING FOR EVERYONE. The Arctic is a global regulator. By protecting it, we are acting for the planet. **To stop the runaway climate of the ARCTIC Ocean, it is time to stop the war in Ukraine and the stratospheric water vapor deposition of the World Air Transport which in the northern hemisphere is equivalent to TWO annual explosions of an underwater volcano of the Hunga Tonga type.**

Quarter	1st	Jan Feb March		2nd	Apr May June	3rd	Jul Aug Sep	4th	Oct Nov Dec
year	North Pole	South Pole	Notes	North Pole	South Pole	North Pole	South Pole	North Pole	South Pole
Season	Winter	Summer		Spring	Fall	Summer	Winter	Fall	Spring
2004	-0,6°	-0,1°		0,25°	-0,65°	-0,5°	-4°	-0,8°	0,6°
2005	4,5°	1,2°		1,6°	-0,25°	0,3°	1,3°	3°	1,7°
2006	4°	-0,25°		2,5°	-1,1°	0,8°	0,4°	3,4°	-0,6°
2007	3,5°	0°		2°	1,8°	1°	1°	3,5°	0,1°
2008	2,1°	0,3°		1,65°	0°	1,4°	0,75°	3,5°	0,2°
2009	6°	-1,7°		0,37	0,9°	1,8°	0,4°	5,4°	1,1°
2010	4°	2°		3,5°	-1,2°	1,1°	-0,4°	4°	0,8°
2011	6°	1°		2,3°	-1,1°	1,3°	2,7°	4,2°	2,6°
2012	5°	1,1°		2,2°	-0,6°	2°	-1,1°	6°	1,9°
2013	2,6°	1,3°		1,6°	-0,9°	0,3°	3,8°	2,8°	1,6°
2014	5,5°	-0,8°		1,75°	1,52°	0,7°	1,7°	2°	0,6°
2015	4°	0°		1,5°	-0,7°	1,3°	-1,5°	4,5°	0,7°
2016	7°	-0,9°		1,5°	-0,3°	3°	-0,2°	7,5°	1,2°
2017	5°	1,1°		0,7°	1,22°	0,8°	-0,75°	4°	0,7°
2018	6°	0,9°		0,45°	1°	1,15°	0°	4,2°	2,7°
2019	3,4°	1,6°	Covid 19	2,7°	-0,4°	2,2°	1,15°	4,9°	0,4°
2020	2,2°	0°	Covid 19	4,3°	1,7°	1,6°	0°	5°	0°
2021	5,7°	-0,3°		3,2	-2°	2°	-1°	4,5°	-0,7°
2022	4,8°	0,3°	explosion	1,6°	1,12°	1,6°	2,1°	3,7°	-1,8°
2023	5,9°	-1°	Volcano	1,5°	0,42°	2,2°	1,5°	5°	-1,2°
2024	4,2°	-1,2°	Hunga	3,1*	1°	2,1°	3,2°	6,5°	-0,2°
2025	6,5°	0°	Tonga	1,60°	1,62°	1,6°	3,7°	7°	-0,2°
2026	6°	0°		2,3°	0°				

