OBSERVER REVIEW

AUGUST 2025

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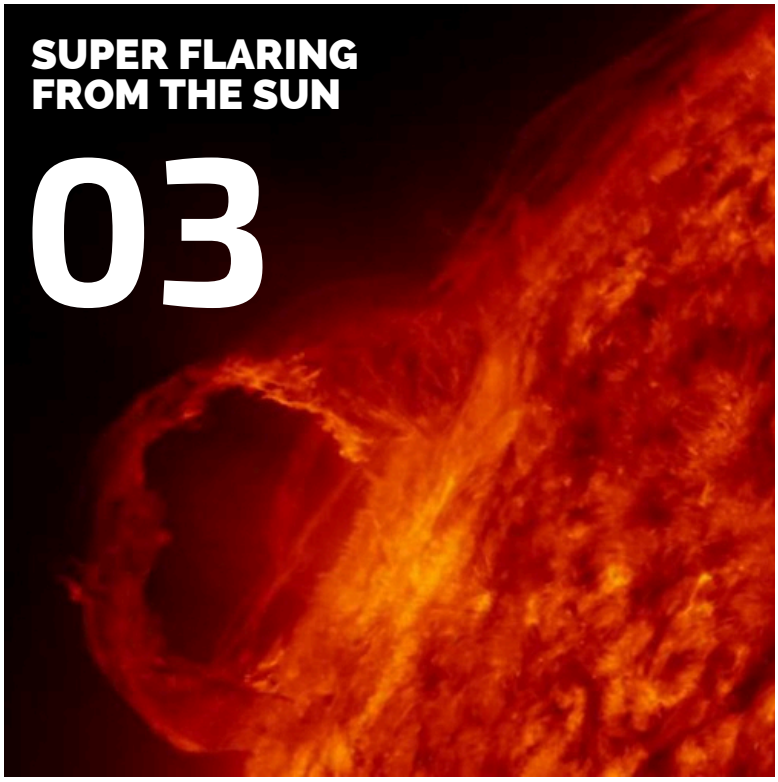
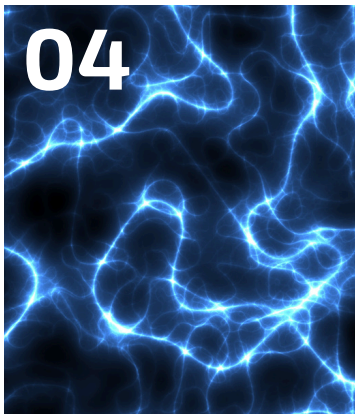
AUGUST





SOLAR FORCING OF THE GLOBAL ELECTRIC CIRCUIT

As we know, Earth's atmosphere is not just air, clouds, and weather. It is also part of a planetary-scale electrical system called the global electric circuit.

SOLAR FORCING OF TORNADOS

When most of us think about tornadoes, we picture warm, humid air, clashing weather fronts, and supercells towering over the American Midwest.

FEATURED ARTICLES

AND MORE!

SUPER FLARING FROM THE SUN

ARTICLE REFERENCED:
THE X-RAY CLASS OF THE CARRINGTON FLARE

The only superflare the sun has produced in modern times is the Carrington Event in 1859, when a massive solar storm caused major auroras visible at low latitudes, and the telegraph wires in the United States caught fire. It is estimated that a similar event today could take-out global power grids, leaving critical infrastructure crippled, and leading to the death of up to 90% of humans from lack of clean water, food distribution, emergency services, heating, etc.

Previous estimates of the X-ray class of the Carrington event ranged from X40 to X85, but a new study is re-evaluating that mark. The new analysis suggests that the likely range of energy during the event was X81 to X146, with the most-likely value being X105. This new value is in better agreement with the magnitude scaling and cyclical nature of solar superflares:

It is believed that an X1000 event occurs every 6000 years, an X500 occurs every 3000 years, and an X250 every 1000 years. Geologic evidence suggests a Carrington-level event hits earth about every 200 years, and that value should be close to X100. Previous estimates of a lower value left a questionable gap or uncertainty in the lower range of the solar superflare cycle, but this new study fills that gap, reduced the uncertainty, and comports with well-established estimates, mathematically.

We are 166 years past the Carrington Event, meaning that we are approaching the danger zone for another event, and deeper looks into historical geologic evidence suggests the bigger cyclical events are due soon as well. When (not if) the sun hits earth with another such event, it is likely to result in the end of modern civilization.

SOLAR FORCING OF THE GLOBAL ELECTRIC CIRCUIT

ARTICLE REFERENCED:
MAGNETOPAUSE LOCATION AND SOLAR WIND TURBULENCE LEVEL DURING FDS AND THEIR IMPACTS ON THE GLOBAL ELECTRIC CIRCUIT

As we know, Earth's atmosphere is not just air, clouds, and weather. It is also part of a planetary-scale electrical system called the global electric circuit. In this circuit, thunderstorms and electrified clouds act like batteries, charging the ionosphere positively while the ground is charged negatively. Between them, a steady current flows even in "fair-weather" skies, producing a global pattern of atmospheric electric fields.
One of the most intriguing features of this fair-weather field is its near-uniform daily variation, called the Carnegie curve, which scientists have measured over oceans and land for more than a century. The global electric circuit is not isolated. It is embedded in the solar wind.

One such solar influence comes from Forbush decreases, which are sudden drops in the intensity of galactic cosmic rays that penetrate Earth's atmosphere and help maintain its ionization. By reducing this ionization, Forbush decreases can change the resistance of the atmosphere, which in turn modifies the global electric circuit.

A RECENT STUDY BY LI ET AL. (2025) EXPLORES A CRUCIAL QUESTION: WHY DO ONLY LARGE FORBUSH DECREASES CAUSE A MEASURABLE INCREASE IN THE GROUND-LEVEL POTENTIAL GRADIENT OF THE GLOBAL ELECTRIC CIRCUIT, WHILE SMALLER ONES SEEM TO LEAVE IT UNAFFECTED?

Forbush decreases occur when large-scale solar wind structures, most commonly coronal mass ejections and sometimes corotating interaction regions, sweep past Earth. Their strong magnetic fields and turbulence act like shields, blocking incoming galactic cosmic rays.

Because galactic cosmic rays are a key ionization source in the middle and upper atmosphere, a sharp drop in their flux reduces atmospheric conductivity. If the upward current in the global electric circuit remains constant, the ionospheric potential must increase to maintain the current. This change is detectable as a rise in the potential gradient at the surface.

The study showed that only Forbush decreases with a large amplitude decrease in galactic cosmic ray flux (greater than about eight percent, measured directly by the Alpha Magnetic Spectrometer on the International Space Station) produced increases in the potential gradient at the Complejo Astronómico El Leoncito observatory in Argentina.

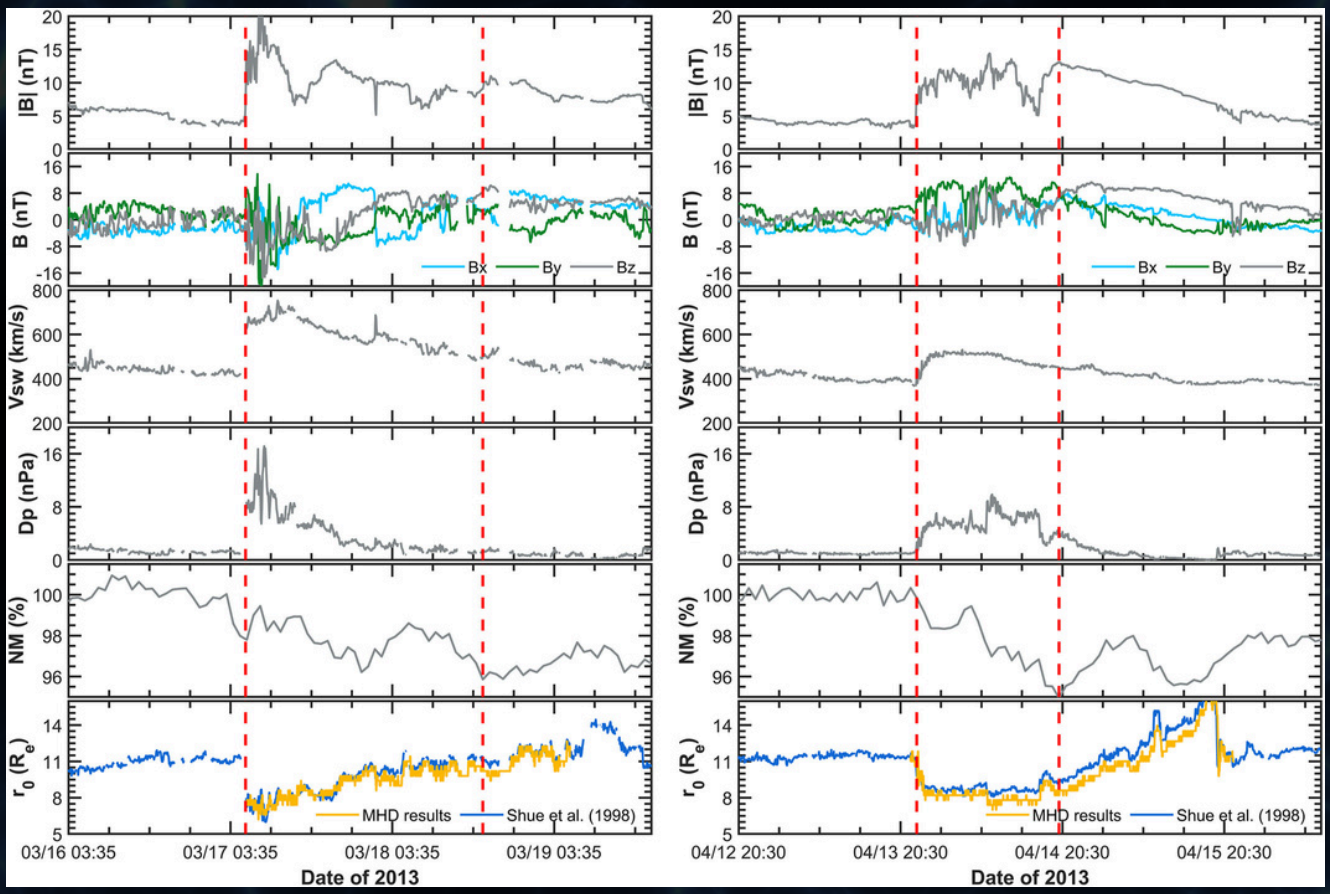
THIS HINTED AT TWO CATEGORIES OF FORBUSH DECREASES:

POTENTIAL-GRADIENT-EFFECTIVE

Large galactic cosmic ray flux drops, magnetospheric disturbance, potential gradient increase

POTENTIAL-GRADIENT-INEFFECTIVE

Smaller drops, minimal potential gradient change



"The subsolar standoff distance for two Forbush decrease (FD) events. The left (right) column is for event No. 9 (10) from Table 1 of Tacza et al. (2024). In both panels, from top to bottom, the magnitude of the magnetic field , the 3-components of , the solar wind speed , the dynamic pressure , the normalized neutron monitor (NM) counts from the Oulu station, and are shown. For , the yellow curve represents results from magnetohydrodynamic simulations, and the blue curve is derived from the empirical formula given in Shue et al. (1998). The vertical dashed lines in each panel are the FD starting time from the IZMIRAN database and the FD maximum time from the Oulu NM station, respectively."

The team also measured the turbulence level in the interplanetary magnetic field during Forbush decreases, quantified by the root mean square of the fluctuating magnetic field. Higher turbulence levels correlate with stronger scattering of galactic cosmic rays in the solar wind, which reduces their flux before they even reach Earth's magnetosphere.

Although the turbulence level and Forbush decrease amplitude were positively correlated, this was not enough to explain the potential-gradient-effective versus potential-gradient-ineffective divide. Events with similar turbulence levels could still differ dramatically in potential gradient impact, depending on whether the magnetosphere was strongly compressed.

THE RESEARCH ALSO SHOWS THAT LARGE FORBUSH DECREASES FOLLOW A TWO-PHASE PROCESS IN HOW THEY MODULATE GALACTIC COSMIC RAYS. IN THE FIRST PHASE, TURBULENCE WITHIN A CORONAL MASS EJECTION SHEATH OR A COROTATING INTERACTION REGION ACTS AS A SHIELD, REDUCING THE GALACTIC COSMIC RAY FLUX BEFORE THESE PARTICLES REACH THE MAGNETOSPHERE.

The second phase occurs only if the magnetosphere is significantly compressed, with the subsolar standoff distance dropping below about seven Earth radii. In this scenario, increased turbulence inside the compressed magnetosphere scatters and blocks even more cosmic rays, causing a sharper drop in atmospheric ionization and producing a measurable increase in the potential gradient.

According to this model, only Forbush decreases that feature both strong turbulence and a low standoff distance produce substantial changes in the global electric circuit. Then this framework was applied to 142 events identified by Wang and co-workers in 2023, they found that coronal-mass-ejection-driven Forbush decreases often met both conditions and had strong potential gradient effects, while those driven by corotating interaction regions rarely compressed the magnetosphere enough for the second phase to occur, explaining their weaker influence.

Event No. [a]	FD start (UT)	FD max decrease (UT)	A/MagnM (%)	R_0 [b] (Re)	α (nT)
6	2011/08/05 17:51	2011/08/06 23:00	13.6/4.8	6.53	1.15
7	2011/09/09 12:42	2011/09/10 22:00	8.1/3.2	7.30	1.11
8	2011/09/17 03:43	2011/09/17 22:00	6.6/2.4	7.51	0.44
9	2011/09/26 12:35	2011/09/26 19:00	19.3/5.1	6.78	2.86
10	2011/10/24 18:31	2011/10/25 05:00	10.3/6.5	6.33	1.25
11	2011/11/28 21:50	2011/11/30 03:00	2.5/1.8	8.03	0.59
15	2012/02/14 01:00	2012/02/15 22:00	6.7/2.4	8.97	0.25
16	2012/02/27 12:00	2012/02/29 00:00	8.4/2.1	7.89	0.29
20	2012/04/25	2012/04/26 00:00	3.2/1.3	9.43	0.35

"CME-Induced Forbush Decreases Events Examined in This Study"

- "a Event numbers are from Table 3 of Wang et al. (2023).
- b Computed using the Shue model (Shue et al., 1998)."

SOLAR FORCING OF TORNADOS

ARTICLE REFERENCED:
OCCURRENCE OF TORNADO OUTBREAKS INFLUENCED BY SOLAR WIND–MAGNETOSPHERE–IONOSPHERE–ATMOSPHERE COUPLING

When most of us think about tornadoes, we picture warm, humid air, clashing weather fronts, and supercells towering over the American Midwest. But a growing body of research is pointing to an "unexpected" co-conspirator: the Sun.

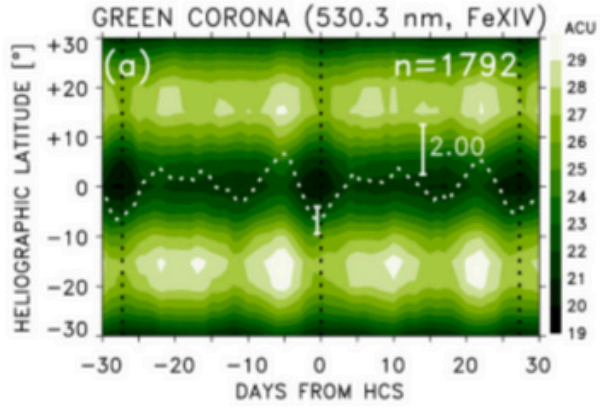
A study by Prikryl and Rušin (2025) has found that many of the United States' largest tornado outbreaks show a striking statistical link to bursts of solar activity that ripple through the space–Earth system. The connection relates to how the solar wind interacts with Earth's magnetosphere, ionosphere, and atmosphere, subtly altering conditions far below in the troposphere where storms form.

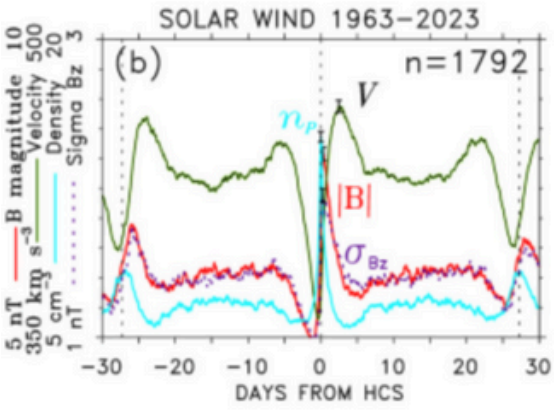
THE TEAM EXAMINED SIX DECADES OF U.S. TORNADO RECORDS, ALIGNING THEM WITH EVENTS IN THE SOLAR WIND, LIKE THE FOLLOWING:

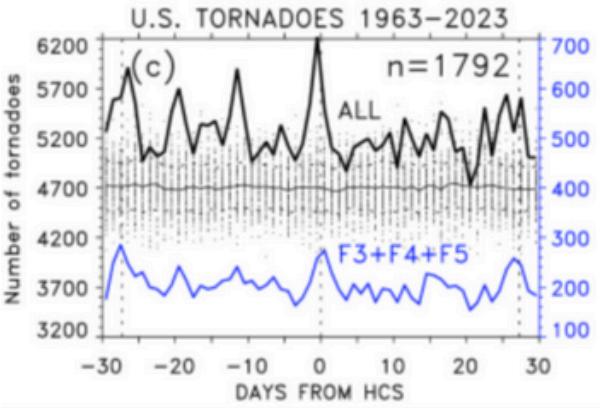
The Heliospheric Current Sheet is a vast, wavy boundary in the Sun's magnetic field, and crossings occur when Earth moves through this magnetic divide.

Co-rotating Interaction Regions form where compressed plasma builds at the front of high-speed solar wind streams emerging from coronal holes.

Also, Interplanetary Coronal Mass Ejections are powerful shocks that travel outward from the Sun following large solar eruptions.







By applying a “superposed epoch” analysis, essentially stacking many events on a timeline to find common patterns, they found that the cumulative number of tornadoes peaked just before or right at these solar wind disturbances.

THE SIGNAL WAS STRONGEST FOR LARGE OUTBREAKS (20+ TORNADOES IN A DAY), WHICH OFTEN FELL INTO FOUR CATEGORIES:

TYPE A: FOLLOWING CIR ARRIVALS.

TYPE B: NEAR HIGH-DENSITY PLASMA ADJACENT TO AN HCS.

TYPE C: AFTER ICME IMPACTS.

TYPE D: IN THE DECLINING PHASE OF MAJOR HIGH-SPEED STREAMS.

CONCLUDING THOUGHTS

Solar wind activity can trigger auroras in the upper atmosphere, which generate atmospheric gravity waves that travel downward into the troposphere. Though weaker at lower altitudes, these waves can interact with the jet stream and frontal boundaries, releasing conditional symmetric instability that strengthens extratropical cyclones, the systems that often produce supercells.

Type	Dates (UT) (# of tornadoes)	Location/State	Key date of HCS, CIR or ICME
?	12 Apr 1965 (47)	Midwest	? (data gap)
A*	7–8 May 1973 (18, 25)	Midwest, Southeast	CIR: 6 May*
A	28–29 May 1973 (41, 23)	Midwest, Southeast	HCS/CIR: 28 May
A*	3–5 Jun 1973 (18, 20, 24)	Midwest	CIR: 2 Jun*; HSS $> 700\,\mathrm{km\,s^{-1}}$
A	4 Apr 1974 (143)	Midwest to South	HCS/CIR: 3 Apr
A	30–31 May 1985 (17, 30)	Midwest, Great Lakes	HCS/CIR: 31 May; HDP
C	24–25 Nov 2001 (23, 45)	Southeast	ICME: 24 Nov (Dst −221 nT)
B	5 Apr 2011 (46)	Southeast	CIR/HCS: 5 Apr; HDP
B	10–11 Apr 2011 (27, 20)	Midwest	HCS/CIR: 11 Apr; HDP
B	15–17 Apr 2011 (56, 67, 55)	Great Plains, Southeast	HCS/CIR: 17/18 Apr; HDP
A	20 Apr 2011 (80)	East North Central	CIR: 20 Apr
D	26 Apr 2011 (50)	South	CIR: 24 Apr; HSS declining
B*	27–28 Apr 2011 (110, 173)	Southeast	HCS/CIR: 28/29 Apr*; HDP
B*	25–26 May 2011 (49, 93)	Midwest, Great Plains, South	HCS/CIR: 26 May*; HDP
B*	19–21 Jun 2011 (17, 10, 37)	Great Plains, Midwest	HCS/CIR: 21 Jun*; HDP
D	14–16 Apr 2012 (14, 84, 14)	Great Plains	CIR: 12 Apr*; HSS $\sim 600\,\mathrm{km\,s^{-1}}$
A	11 Dec 2021 (68)	Central	HCS/CIR: 10 Dec
A	16 Dec 2021 (125)	Midwest	CIR: 15 Dec

“Large tornado outbreaks (* recurrent). Tornado daily counts centered on 00:00 UT ±12 h for the given dates are shown in parentheses.”

SOLAR FORCING OF THE JET STREAM

ARTICLE REFERENCED:
THE DISRUPTED JET STREAM AND ITS INFLUENCE ON FLIGHT TIME DURING SOLAR PROTON EVENTS

A team led by Xiaoheng Xu has provided the first direct evidence that solar proton events can physically shift the polar jet stream. This high-altitude band of westerly winds helps steer weather systems across continents.

In the mesosphere and upper stratosphere, solar proton events produce reactive nitrogen and hydrogen compounds that rapidly destroy ozone.

Ozone loss changes how the atmosphere absorbs and redistributes solar energy, disturbing the balance of temperatures between the equator and the pole. This affects the polar vortex, a large circulation of stratospheric winds. Through a chain of connections between atmospheric layers, changes in the polar vortex can shift the position of the tropospheric jet stream below.

The new analysis, which covered forty-two solar proton events across an entire solar cycle, found a consistent pattern. In the days following a solar proton event, the polar jet stream moved toward the pole. Over mid-latitudes between about forty-five and sixty-five degrees north, winds weakened. At higher latitudes between sixty-five and eighty degrees north, winds strengthened. This shift typically lasted three to four days.

The researchers found a novel way to detect this shift by using commercial airline data. They examined more than sixteen thousand flights along fifteen transcontinental routes near the polar jet stream. During solar proton events, westbound flights, which normally face strong headwinds, arrived on average seven minutes earlier. Eastbound flights, which normally benefit from strong tailwinds, took about seven minutes longer.

The pattern fits the physics. A jet stream that has shifted toward the pole means weaker winds along mid-latitude flight paths, altering the balance of headwinds and tailwinds. Although seven minutes may sound minor, across thousands of flights these changes can add up to significant fuel use and cost differences. In extreme winter cases, shifts were far more dramatic, with eastbound flights taking as much as twenty-three minutes longer and westbound flights arriving up to fifteen minutes earlier.

When the Sun flares, the jet stream can shift, and that change is now measurable from the ground and from the air.

SOLAR STORMS AND AIRCRAFT INCIDENTS

ARTICLE REFERENCED:
THE RELATIONSHIP BETWEEN TURBULENCE-RELATED AIRCRAFT ACCIDENTS AND GEOMAGNETIC STORMS IN CIVIL AVIATION

Newly compiled record of civil aviation incidents between 1928 and 2024 reveals something unusual about turbulence. In 35 fatal turbulence-related accidents worldwide, every single one coincided with a geomagnetic storm.

From the nearly 2,000 fatal civil aviation accidents analyzed, only 35 were directly caused by turbulence. The pattern emerged when researchers cross-referenced the dates and locations of those 35 accidents with geomagnetic storm records:

40% OCCURRED AT LATITUDES ABOVE 40°

37% BETWEEN 30° AND 40°23%

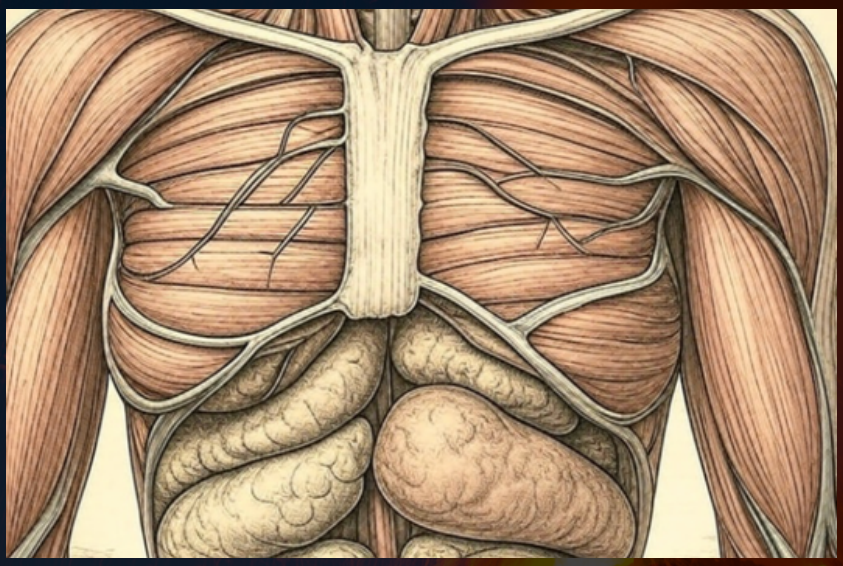
BELOW 30° WHILE THE SEVERITY OF THE STORMS VARIED, MODERATE STORMS ACCOUNTED FOR 45% OF CASES, WEAK STORMS FOR 42%, AND STRONG OR VERY STRONG STORMS FOR 12%, THE LINK WAS CONSISTENT.

Even more striking, these accidents tended to cluster during specific phases of the solar cycle, most often in the decreasing phase or at the tail end of the increasing phase, when coronal holes are more common and high-speed solar wind streams regularly buffet Earth's magnetosphere

The fact that many of these fatal incidents occurred during months near the equinoxes, March, April, September, and October, adds another clue. Equinoxes are known periods when Earth's magnetic field is more directly aligned with incoming solar wind streams, making geomagnetic disturbances more likely and potentially more intense.

SOLAR FORCING OF HUMAN HEALTH

ARTICLE REFERENCED: HTTPS://WWW.NATURE.COM/ARTICLES/S43856-025-00887-7 HTTPS://WWW.RESEARCHGATE.NET/PROFILE/NIKOLAY-TAKUCHEV/PUBLICATION/394005066_SOLAR_ALPHA_PARTICLES_WITH_HIGH_ENERGY_INFLUENCE_NEOPLASMS_MORTALITY_IN_EUROPE_AND_THE_MEDITERRANEAN/LINKS/6883627600A2407910A3D9A3/SOLAR-ALPHA-PARTICLES-WITH-HIGH-ENERGY-INFLUENCE-NEOPLASMS-MORTALITY-IN-EUROPE-AND-THE-MEDITERRANEAN.PDF?__CF_CHL_TK=8D1YRUV5LKE4DGHQI9IB7YRTRPG.IEJIBRZK9AANJAM-1753914563-1.0.1.1-LNOCPNPJDDPYLYZMOOZ46Z0PIG1.KAZCFRXKDEOGGY0



TWO NEW STUDIES ARE ADDING TO THE BROAD ARRAY OF KNOWLEDGE ON SPACE WEATHER IMPACT TO THE HUMAN BODY, CONFIRMING PREVIOUSLY KNOWN CORRELATIONS WITH HEART ISSUES AND CANCER, WHILE ADDING DETAIL.

The first study covers myocardial infarction during solar storms. While there have been hundreds of studies on the solar connection (geomagnetic) to heart attacks, this study looked at the difference in reaction between men and women at the low latitude region of Brazil. The study not only confirmed the connection between geomagnetic disturbances and heart attacks, with a 300% increase in infraction events during significant solar storms, but it also demonstrated that women are considerably more vulnerable to the environmental electromagnetic impact than men.

The other study investigates the hypothesis that high-energy solar alpha particles, capable of penetrating the Earth's atmosphere, increase mortality from neoplasms (deadly tumors) in a specific latitudinal band between 30° and 60° north latitude, particularly affecting Europe and the Mediterranean. The analysis reveals a statistically significant correlation, especially in mountainous areas, suggesting alpha particles contribute to neoplasm mortality by ionizing atoms and impairing cellular metabolism.

These studies, and the numerous others on the solar electromagnetic impact to human health, not only inform the field about the connections, but as earth's magnetic field continues weakening in the ongoing magnetic pole shift, each connection is expected to amplify.

PRE-EARTHQUAKE SIGNALS

ARTICLE REFERENCED:
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HTTPS://WWW.SCIENCEDIRECT.COM/SCIENCE/ARTICLE/PII/S0273117725007100
HTTPS://WWW.SCIENCEDIRECT.COM/SCIENCE/ARTICLE/ABS/PII/S0273117725007641
HTTPS://GENESCELLS.RU/0016-7940/ARTICLE/VIEW/683623

A 2024 study in Türkiye applied advanced machine learning to ionospheric data, achieving remarkable accuracy in detecting days before large earthquakes. Using the Random Forest algorithm, researchers classified days into four categories: geomagnetically quiet, geomagnetically disturbed, pre-earthquake, and earthquake days. Accuracy rates rose with earthquake magnitude, from 86.72 percent for a magnitude 6.7 event to over 95 percent for the magnitude 7.8 Kahramanmaraş earthquake. The ability to detect pre-earthquake disturbances with F1-scores above 84 percent points to ionospheric monitoring as a serious candidate for integration into future early warning systems.

While many earlier studies focused on a single atmospheric or ionospheric indicator, a large-scale analysis of earthquakes in Japan in 2011 paired geomagnetic field data with total electron content (TEC) measurements. Over 694 magnitude 5.0 and greater events were examined across a 60-day lead time, excluding days affected by geomagnetic storms. Anomalies in both parameters were detected even under geomagnetically quiet conditions.

Geomagnetic disturbances appeared more frequently than TEC anomalies, but when both occurred, they aligned in time, often emerging up to a month before the mainshock. The findings support the lithosphere–atmosphere–ionosphere coupling model, in which tectonic stress changes propagate upward, subtly disturbing the upper atmosphere.

On March 28, 2025, Myanmar experienced a powerful magnitude 7.7 earthquake. By analyzing 49 parameters across lithospheric, atmospheric, and ionospheric layers, researchers identified clear anomalies in the 16 days prior.

THESE INCLUDED CHANGES IN AEROSOL OPTICAL DEPTH, SURFACE TEMPERATURE, OUTGOING LONGWAVE RADIATION, ATMOSPHERIC GASES, TEC, AND GEOMAGNETIC FIELD COMPONENTS. USING A FUZZY INFERENCE SYSTEM TO COMBINE THESE INDICATORS, THE TEAM PREDICTED THE EVENT TWICE IN ADVANCE; ONCE AT 16 DAYS AND AGAIN AT 4 DAYS BEFORE THE MAINSHOCK. THE RESULTS REINFORCE THE VALUE OF COMBINING MANY INDEPENDENT SIGNALS, AS NO SINGLE PRECURSOR IS CONSISTENTLY RELIABLE ACROSS ALL EARTHQUAKE CONTEXTS.

Not all pre-earthquake signals require weeks of monitoring. An integrated ionospheric study of the magnitude 8.1 earthquake east of Simushir Island on January 13, 2007, found that 13 to 14 hours before the event, distinct anomalies appeared in both the E- and F-regions over two ionosonde stations within the preparation zone.

The anomalies were further validated by examining the Barbier δ-parameter, which helped separate genuine seismic precursors from unrelated ionospheric fluctuations. Such short-term signals may be especially valuable in rapid-response early warning systems.

TAKEN TOGETHER, THESE STUDIES SHOW THAT EARTHQUAKE PREPARATION PROCESSES LEAVE DETECTABLE FINGERPRINTS IN THE ATMOSPHERE AND IONOSPHERE. MACHINE LEARNING CAN IMPROVE CLASSIFICATION ACCURACY, DUAL-PARAMETER APPROACHES CAN REDUCE FALSE POSITIVES, AND MULTI-PRECURSOR FUSION CAN BRIDGE THE GAP BETWEEN SHORT- AND LONG-LEAD PREDICTIONS. THE PATH FORWARD LIKELY LIES IN COMBINING REAL-TIME MONITORING OF GEOMAGNETIC AND IONOSPHERIC CHANGES WITH ATMOSPHERIC, THERMAL, AND GAS EMISSION DATA.

MESOSPHERIC ECHOES

ARTICLE REFERENCED:
HTTPS://WWW.MDPI.COM/2073-4433/16/8/898
HTTPS://MUNIN.UIT.NO/HANDLE/10037/37599

In our previous looks at polar mesospheric echoes, we have been highlighting the undisputed increase in these radar echoes, while combatting the primary mainstream explanation for their increase. Most scientists try to suggest that global warming is causing the extra echoes, but this makes little sense- the echoes are driven by the ice, dust, and electrical ionization in the polar mesosphere, and so we've argued that the better explanation for their increase over the last few decades is the magnetic pole shift, which is allowing extra cosmic ray and solar proton bombardment to amplify the electrical activity in the upper atmosphere.

While some studies have confirmed this electromagnetic mechanism, and even blamed the sun, two new studies are adding to this alternative-explanation side of the argument. These new studies not only identify the critical importance of electron density and turbulence for creating these echoes- turbulence at high altitude is also driven by space weather- but they identify space weather events specifically.

They noted a dramatic increase in mesospheric echoes during solar flares, high speed solar wind, and geomagnetic disturbances. Since the sun and space weather activity has been generally declining during the last few decades, while these echoes have been increasing, the only explanation is that earth's weakening magnetic field is leaving our atmosphere more vulnerable to energy from space. This is expected to continue, and get worse.

SMOC COLLAPSE AND REVERSAL

BY: BEN DAVIDSON

ARTICLE REFERENCED:
RISING SURFACE SALINITY AND DECLINING SEA ICE: A NEW SOUTHERN OCEAN STATE REVEALED BY SATELLITES

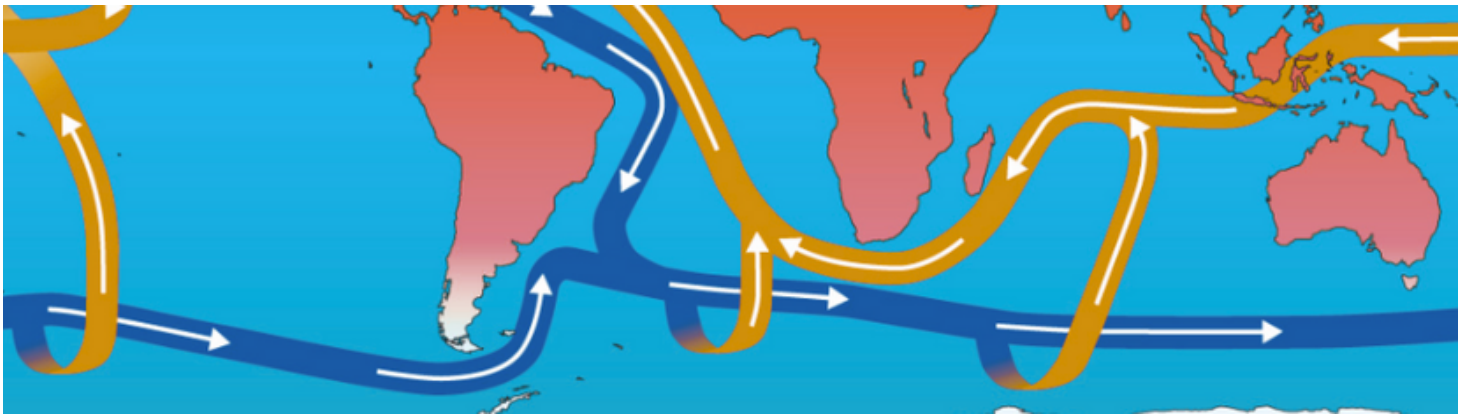
A new bombshell study is revealing that the southern meridional overturning circulation (SMOC) has collapsed and reversed. This is a major problem, and one that has been underreported in both visibility and importance.

The SMOC is one of the anchor flows of the oceanic transport flows, and it is connected to every ocean. Recently, there has been considerable news about the collapsing Atlantic meridional overturning circulation (AMOC), which could lead to a tremendous cooling phase onset over a very short period of time- the movie The Day After Tomorrow was based on the collapse of the AMOC.

The rapid decline of the AMOC has been very well documented, but it has come with a glaring question: How could it possibly be collapsing so quickly? The collapse and flow-reversal of the SMOC is the answer. The fact that this flow has been collapsing, and has already reversed, now makes the changes to the AMOC and the "North Atlantic Cold Blob" make sense.

All of the oceanic changes are being driven by a combination of the magnetic pole shift and climate variability, and as we move deeper into the geomagnetic event, all the ocean heat transport systems are expected to eventually collapse, leading to a major cold event on earth, where we basically enter a new ice age in a very short period of time.

It should also be noted that the collapse of the SMOC occurred in 2015, and we are just hearing about it in 2025. Whether by error, ignorance, or intentional obfuscation, it is a serious issue that it took so long for scientists to recognize, acknowledge and inform the public about this event.



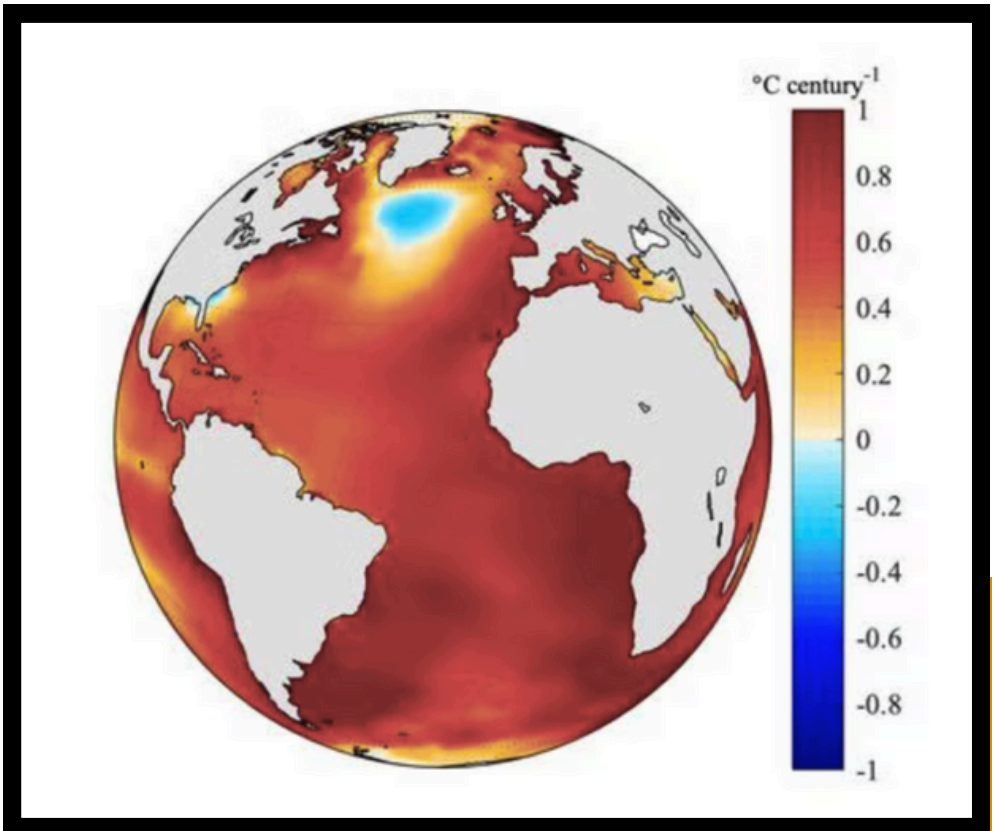
AMOC AND ATLANTIC COLD BLOB

ARTICLE REFERENCED:
TRANGE ATLANTIC COLD SPOT TRACED TO OCEAN SLOWDOWN

South of Greenland, a pool of cold water known as the "Atlantic Cold Blob" has remained a persistent feature. A new study points to a steady weakening of the Atlantic Meridional Overturning Circulation, or AMOC.
The AMOC is one of the largest circulation systems on the planet. It carries warm, salty water northward near the surface and sends colder, deeper water back toward the tropics. This constant exchange redistributes heat and salt, influencing rainfall patterns, storm tracks, and seasonal temperatures across vast regions.

The study, published in Communications Earth & Environment, analyzed more than a century of temperature and salinity records, as direct AMOC measurements have been collected for only about 20 years. The research team compared these observations with nearly 100 climate model simulations. Only the models that included a weakened AMOC reproduced the distinctive cooling south of Greenland.

When the AMOC slows less warm, salty water reaches the subpolar North Atlantic. This allows cooler water to dominate the surface, while freshwater from glacial melt and precipitation lowers salinity.
These shifts alter atmospheric circulation, including changes to the position of the jet stream, which in turn influences weather patterns far beyond the North Atlantic. The reconstruction suggests that the weakening of the AMOC has been underway for more than a century.



"Atlantic sea surface temperature trend, 1900-2005 in ˚C, from the average of six observation datasets. (Kai-Yuan Li/UR)"

BEAUFORT GYRE RELEASING SLOWLY

ARTICLE REFERENCED:
BEAUFORT GYRE LIQUID FRESHWATER CONTENT CHANGE UNDER GREENHOUSE WARMING FROM AN EDDY-RESOLVING CLIMATE SIMULATION

The Beaufort Gyre, long recognized as the Arctic's largest liquid freshwater reservoir, has been under close watch for decades. We have tracked its steady accumulation of meltwater and its potential to release large volumes into the North Atlantic.

Using a model that captures ocean features down to about 5 kilometers in the Beaufort region, the research team simulated changes from 1850 to 2100.

The results align with past observations, showing a rapid build-up from around 16,000 cubic kilometers of freshwater in the early 2000s to more than 22,000 cubic kilometers today, followed by a plateau. Looking forward, the model projects continued growth in freshwater content, combined with stronger variability on roughly ten-year cycles.

While earlier research often pointed to wind as the primary force shaping the Beaufort Gyre's freshwater budget, new modeling shows that sea ice melt plays an equally significant role. Locally melted ice releases freshwater directly into the Gyre, while drifting ice from surrounding areas adds another 20 to 30 percent to the supply.

With less ice to absorb wind energy, momentum transfer from the atmosphere to the ocean becomes more efficient, strengthening surface stress curl and enhancing Ekman transport that pulls additional freshwater into the Gyre. Together, these processes boost both long-term freshwater storage and the strength of the Gyre's natural decadal variability.

RATHER THAN A SUDDEN DRAINAGE, THE GYRE'S RELEASE EVENTS APPEAR TIED TO ITS NATURAL CYCLES. WHEN THE SYSTEM SLOWS, MORE FRESHWATER EXITS TOWARD THE SUBPOLAR NORTH ATLANTIC THROUGH THE FRAM AND DAVIS STRAITS. TRAVEL TIME FROM THE BEAUFORT REGION TO THESE GATEWAYS IS UNDER FIVE YEARS, BUT THE RELEASE ITSELF IS SPREAD OUT OVER A LONGER PERIOD.

The additional freshwater weakens the Labrador Sea branch of the Atlantic Meridional Overturning Circulation by up to 0.5 Sverdrups, or about 10 percent locally.

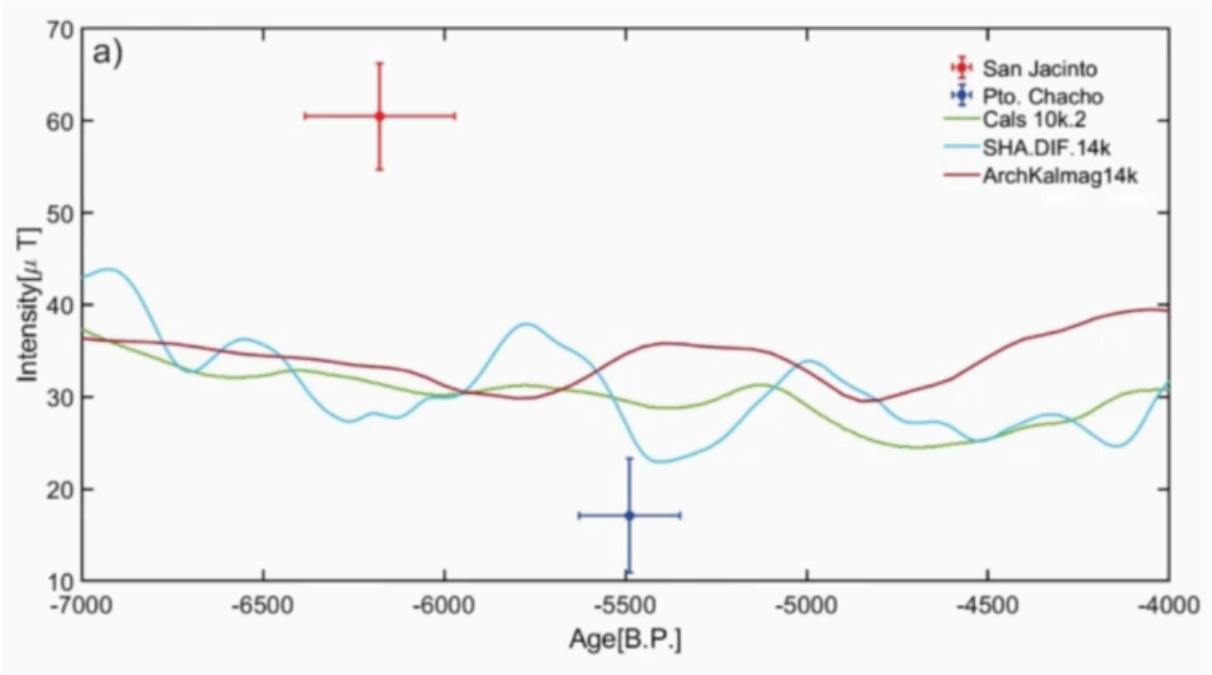
THE LAST DISASTER RECORDED IN SOUTH AMERICA

ARTICLE REFERENCED:
ABSOLUTE GEOMAGNETIC PALEOINTENSITIES OBTAINED FROM THE AMERICAS' PRESUMABLY OLDEST POTTERY

The earth disaster cycle of ~6000 years has been solidly established, and yet the last of the events to be officially discovered is the most recent, 6000 years ago. The evidence for it has also only been unearthed in Asia and Northern Europe.

A new study has identified the event in the Americas for the first time. By examining pottery from Northern Colombia, the team determined that there was an extremely short-lived and deep minimum intensity period of earth's magnetic field- one of the hallmarks of a geomagnetic excursion. This matches the previous finding of the event, which comes from cooled lava remnant magnetization and other sediments.

In the image, the magnetic field had been fairly strong around 6200 BP (4200 BC) at the red cross, and there was a significantly low point marked around 5500 BP (3500 BC) at the blue cross. The idea is that a brief strong period preceded the excursion around 6000 BP (4000 BC), and the blue cross is catching the magnetic field rising again to the model results at the colored lines.



MAGNETIC POLE SHIFT EXTINCTIONS

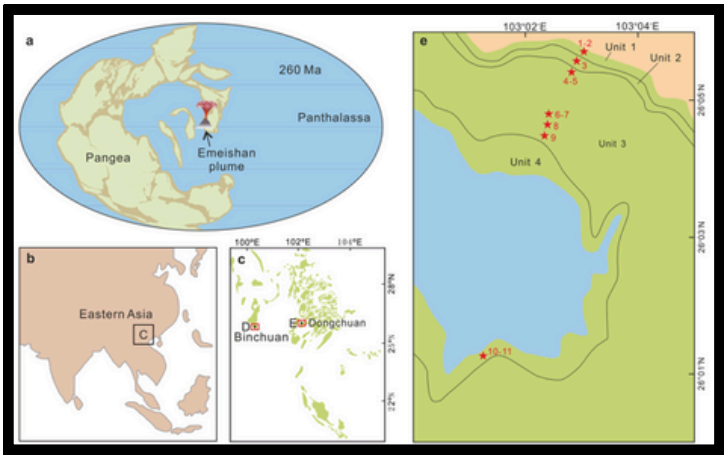
ARTICLE REFERENCED:
EXTREMELY WEAK GEOMAGNETIC FIELD FOLLOWING PERMO-CARBONIFEROUS REVERSE SUPERCHRON AND ITS GEOLOGICAL IMPLICATIONS

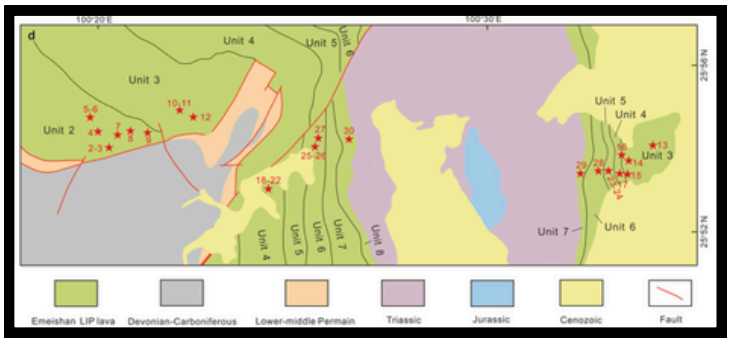
A new study is solidifying two key elements of the earth's magnetic pole shifts that will be extremely relevant in the years ahead as the next such event unfolds. This new analysis confirms that the low points in magnetic field strength, which occur during the magnetic pole shifts, are correlated with large volcanic events and extinction surges within the biosphere.

The study found that large igneous provinces tended to preferentially erupt during these geomagnetic minima, likely resulting from the increased cosmic ray intensity during those times, which directly impacts the viscosity of magma within subterranean chambers. The study also suggests that significant core-mantle boundary heat releases may play a role in these eruptive events.

More importantly, the alignment of large extinction events with these geomagnetic minima is beyond mere statistical chance. Not only do they come with severe volcanic events, but the radiation that causes them is damaging to biological cells and impactful upon the weather.

These changes to the environment are the factors that other studies have found responsible for extinctions during these magnetic pole shifts, and they are why the ongoing event is such a critically underreported aspect of geophysics at this time. Our time is almost up.

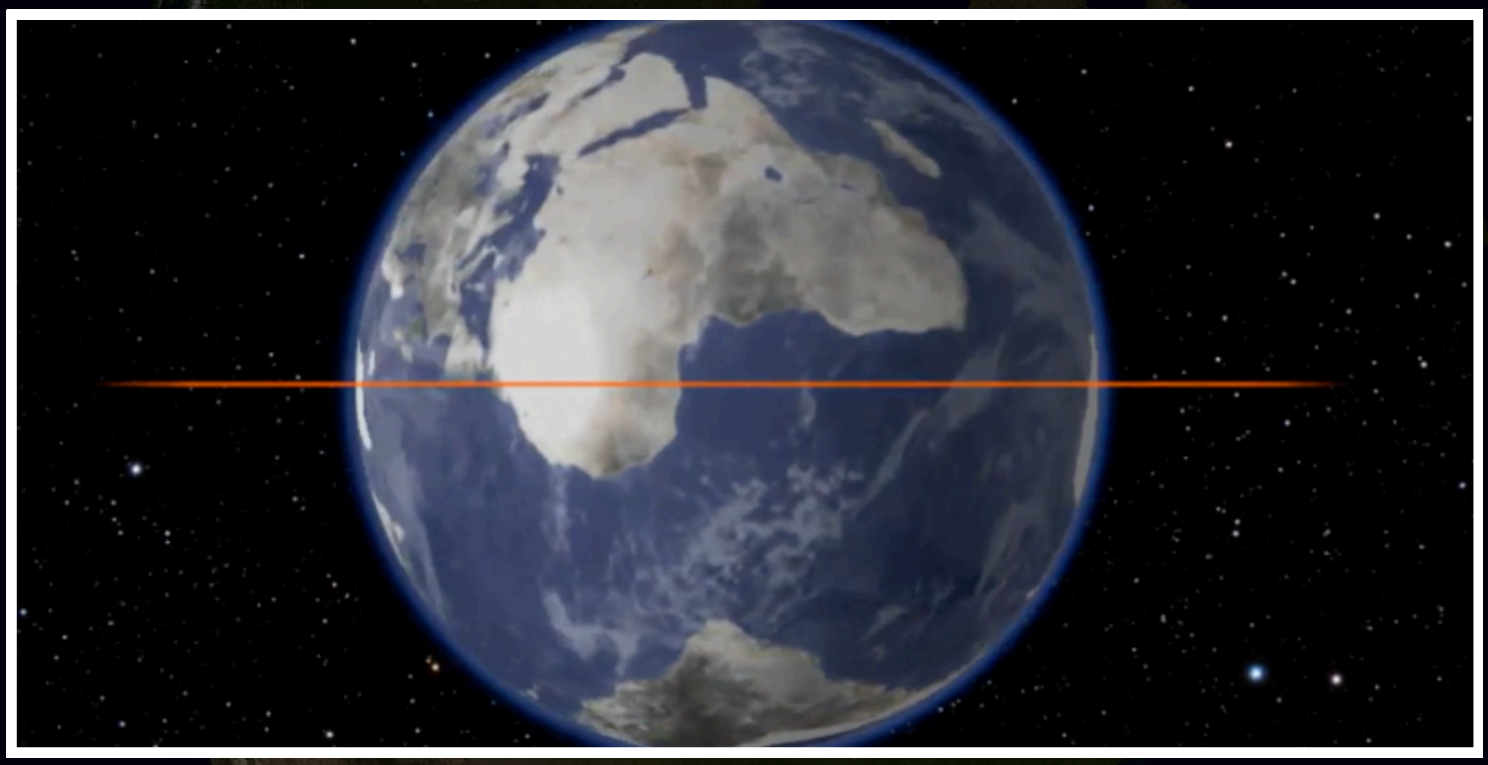




POLAR MOTION INCREASING

BY: BEN DAVIDSON

ARTICLE REFERENCED:
PRELIMINARY ANALYSIS OF THE ANNUAL COMPONENT OF THE POLAR MOTION OVER 180-YEAR DATA INTERVAL



Imagine Earth's axis isn't perfectly steady—it wobbles a tiny bit like a spinning top that's slowing down. This wobble is called polar motion, and it has two main parts: one that repeats every year (the annual component) and another called the Chandler wobble that takes about 14 months. In a new paper, scientists looked at old data from the 1840s to around 2018 to study how the annual part has changed over 180 years.

What they found is pretty shocking: the strength of this yearly wobble, measured in tiny units called milliarcseconds, grew steadily from about 60 to 90 over time, and its timing shifted by around 45 degrees. They also noticed this lines up with differences in winter temperatures between the Northern and Southern Hemispheres, hinting that climate parameters like air, ocean, and water movements might be influencing Earth's spin, or may be influenced by it.

Overall, the study suggests we should keep investigating how Earth's rotation and weather are connected. You should be aware that this dramatic increase in polar motion likely is related to the ongoing magnetic pole shift, and it will likely exacerbate in the years ahead as the next geomagnetic excursion occurs.

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