☑ Fact-Checked Science

EVIDENCE REVIEW · S0 NEWS GLOSSARY

The Observer Glossary's space-weather basics mostly hold; its disaster-cycle terms don't

S0 News of November 13 recommended the Catastrophism Research Association's free Observer Glossary as "238 terms, the ones you hear here regularly" [3 00:03:41–00:03:44]. It has 238 entries, and most of its space-weather definitions match NOAA's and the textbooks' [1] [4]. But of its 309 checkable claims, 212 are overstated, contradicted or unsupported: striking numbers that fail against the standard references, solar control of the weather and of health stated as settled, and a 6,000-year disaster cycle that this site has found false before (our analysis).

By Fact-Checked Science · Published November 13, 2026 · Updated November 14, 2026

OUR ANALYSIS marks our own reasoning and calculations: the count; the sorting of every entry and claim into classes under rules written in advance, and each claim's outcome; the Kp ratio; the temperature record around 1859; and the estimates of what storm currents can do to rock. The verdicts are our assessment. Everything else comes from the numbered sources. For the glossary [1], locators are the PDF's page numbers, and its entries are named in the text; for S0 News of November 13 [3], times in the video. Kp is the three-hourly index of geomagnetic activity, from 0 to 9; Dst measures a storm's depth in nanotesla (nT), more negative for a stronger storm; an excursion is a large, brief swing of Earth's magnetic field that stops short of a full reversal.

The count is right and most space-weather definitions are standard; the striking numbers, the health claims and the disaster cycle are not

OUR ASSESSMENT

238

entries as printed, the number the episode gave: 72 on space weather, 150 on the disaster cycle and 16 names used on the channel (our count) [1] [3 00:03:39–00:03:44]

150

entries open with a standard definition, 147 of them matched to NOAA's space weather glossary, the AMS Glossary of Meteorology or a review we read; 66 open with a claim instead, 5 are S0's own coinages and 17 are names, not rated (our analysis) [4] [5]

212

of the glossary's 309 checkable claims are overstated, contradicted or unsupported; 92 hold, 33 of them with a caveat (our analysis, in the hosted table)

THE CLAIMS

TRUE

"The observer glossery is 238 terms, the ones you hear here regularly."

S0 News of November 13 [3 00:03:39–00:03:44]; "glossery" is the automatic transcript's spelling

It is. The glossary prints 238 entries, each a headword and a definition, with 238 different headwords: 72 on space weather, 150 on the "Earth Disaster Cycle" and 16 names used on the channel (our count) [1]. A few entries define two or three terms at once, such as "Umbra and penumbra". See section 2.

PARTLY TRUE

The glossary's space-weather section defines the book's terms in plain, standard language

The glossary's first section; it says its terms are "defined the way the book uses them" [1 p. 1]

Mostly. 66 of its 72 space-weather entries open with a definition that matches NOAA's glossary, the AMS Glossary or a standard review, and 49 of the 82 checkable claims they add hold, 12 of them with a caveat [4] (our analysis). But some textbook errors are stated as fact: that flares launch coronal mass ejections, an idea long since disproven [6], that the equatorial electrojet forms from the ion fountain [7], and that cosmic rays reach Earth's core [8]. See section 3.

FALSE

Kp 8+ storms "can be 1,000 to 10,000 times more powerful" than Kp 5; filaments "can weigh trillions of tons"; the Carrington storm of 1859 brought a 7 °C spike; the field now loses "about 5% every eight years"

The glossary's entries "Kp index", "Plasma filament", "Carrington event" and "Magnetic field weakening" [1 p. 5], [1 p. 15] and [1 p. 22]

Each fails against the standard references. On the standard Kp-to-ap table a storm of Kp 8+ to 9 has about 5 to 10 times the disturbance of a Kp 5 storm, and even squared, as an energy would scale, at most about 70 to 105 times [9] (our analysis); prominences hold about 0.1–2 billion tonnes [10]; in HadCRUT5 no month after the 1859 storm sits more than 0.14 °C above the three years before it [11], and the Central England record shows no warm spike [12] (our analysis); and since 2014 the dipole has lost under 0.5% a decade (our check of S0's field-loss figures). See section 4.

OVERSTATED

An active or quiet Sun drives the NAO, the AMO, the PDO, ENSO, the jet stream, blocking, stratospheric warmings and clouds, and climate models leave most of the Sun out

About 30 of the glossary's geophysical entries [1 pp. 8–22]

Some solar signals in regional climate are reported, but they are small and disputed, and a review warns that much of this literature rests on weak statistics [13]. Two have the sign reversed: warm AMO phases bring the US less rain [14], and stratospheric warmings are not more frequent at solar minimum [15]. CERN's CLOUD experiment contradicts the cloud claim [16], and the models' solar input includes spectral light and particles [17]. See section 5.

OVERSTATED

Geomagnetic storms and cosmic rays lower heart rate variability, upset the body clock and raise cardiac, stroke, seizure, migraine, anxiety and mood risks

The glossary's entries on the autonomic nervous system, circadian rhythm, heart rate variability and "Space weather health effects" [1 p. 1], [1 p. 2], [1 p. 4] and [1 p. 7]

The studies are observational, small and point both ways: higher Kp went with lower heart rate variability in 809 older men [18], while higher solar radio flux and cosmic rays went with higher variability in a 16-person study [19]. Our review of storms and the brain found the evidence largely associative, and daily studies find deaths a fraction of 1% higher on stormy days (our check of a mortality preprint). See section 7.

FALSE

Catastrophes recur every 6,000 years with a magnetic excursion; one is under way and is expected to peak in the 2040s, when a solar micronova turns the crust 90° in a day; storm currents can melt the layer under the crust and set off earthquakes

About 80 framework claims in the glossary's "Earth Disaster Cycle" sections [1 pp. 8–24], and 12 claims across the glossary on earthquakes and eruptions [1 pp. 3–21]

This site has rated the pillars before: no 6,000-year rhythm of excursions and none under way (our guide to the field), no solar micronova (stop 15), no 90° turn in a day; the galactic current sheet is unsupported. The crust claims fall short by factors of 10^5 to 10^{10} (our analysis); no link between space weather and earthquakes has been shown [20], and a test across magnitudes found none [21]. 69 of the 80 framework claims are contradicted; of the 12 on earthquakes and eruptions, 4 are contradicted, 5 overstated and 3 unsupported. See sections 6 and 8.

1 · THE GLOSSARY

A 26-page glossary, "defined the way the book uses them", for a book it doesn't name

The Observer Glossary is a free 26-page PDF on the website of the Catastrophism Research Association (CRA), headed "Space Weather News & Research Publications 2026" and subtitled "Space Weather News Glossary from the GrokBot Team" [1 p. 1]. It offers "Plain-language definitions" of the space-weather and disaster-cycle "terms used in the book, defined the way the book uses them" [1 p. 1]. S0 News of November 13 recommended it [3 00:03:39–00:03:44].

Who issued it

CRA's page says "The glossary is Ben Davidson's own work", issued "under his Space Weather News imprint", and that each term is defined "the way his book uses it" [2]. The PDF itself names no author: it credits "the GrokBot Team", and every page carries the running head "Space Weather News & Research Publications 2026" [1 p. 1]. It cites no sources for any of its claims, gives no licence and has not been peer reviewed; CRA's site carries "© 2026 Catastrophism Research Association LLC" [2]. So we quote it in short phrases and host none of its text.

Which book

We don't name the book, because neither the glossary nor CRA's pages do. The glossary says "the book" 33 times and mentions some of its features, such as a closing table and a readiness scorecard [1 pp. 19–25]. CRA's glossary page calls it "his book"; its About, Researchers, Library and FAQ pages, which we also read, don't mention it [2]. We didn't read the book itself.

STEP 1

Rules first

Before reading a single definition, we wrote down how to count entries and how to sort every claim into five classes (section 11), with one amendment, added after the count and before any check.

STEP 2

Count

We counted the entries twice, by two methods, and compared the counts page by page.

STEP 3

Check

Definitions were checked in batches against NOAA, the AMS Glossary and standard reviews; each added claim on its own, against this site's earlier verdicts, the literature and three analyses of our own.

STEP 4

Publish the table

All 481 rows, with our one-line reason and our source for each, are in a hosted table that carries none of the glossary's definitions.

The five classes, and how many rows each holds

CLASS	WHAT IT COVERS	ROWS
A	A standard definition and nothing more; five of S0's own coinages ("Zero-day", "Float-away plan") are recorded as "own term", not rated	155
B	A checkable claim added to a definition: a number, a cause, an effect, or what scientists or models leave out	215
C	S0's own framework: the disaster cycle, an excursion or pole shift under way or due, the micronova, the galactic current sheet, the crust's tilt	80
D	Health and biology: heart rhythm, sleep, mood, animal navigation, UV damage to living things	14
E	Names of the channel, its community, products and events: listed, not rated	17

A definition can carry claims of several classes, so the 238 entries make 481 rows. Each B, C or D row gets one of six outcomes: holds, holds with a caveat the glossary leaves out, overstated, contradicted, unsupported or not checkable. The six verdicts above use the site's own scale. We don't rate the membership offer on CRA's page or its "Methodology Standards", which the page links [2].

2 · THE COUNT

238 entries, as the episode said

An entry is a headword followed by a dash and its definition. The PDF prints 238 of them, with 238 different headwords; a separate tally of the dashes in a plain-text version of the PDF also gives 238 (our count) [1].

In the episode's words From the automatic transcript; "glossery" is its spelling.

> *"Folks, to help out, we've got a new free resource from CRA. The observer glossery is 238 terms, the ones you hear here regularly."*
>
> S0 News of November 13 [3 00:03:37–00:03:44]

Entries by section, as the PDF's own outline divides them

SECTION	PAGES	ENTRIES
Space Weather	1–8	72
Earth Disaster Cycle: Geophysical	8–22	128
Earth Disaster Cycle: Astrophysical	22–24	16
Earth Disaster Cycle: Galactic	24	6
Ben-isms (names used on the channel)	25–26	16
All	1–26	238

Without the closing list of names, 222. A few entries define two or three terms at once ("Umbra and penumbra", "VLF, ULF and ELF"), so a count of terms rather than entries would come out a little higher. "The ones you hear here regularly" is the episode's description, which we don't rate. Our review of S0 News of November 13 rates the same sentence, with the same label and verdict.

3 · SPACE-WEATHER BASICS

Most space-weather definitions are standard; a handful of added claims are textbook errors

Of the 72 space-weather entries, 66 open with a definition that matches NOAA's space weather glossary and scales or a standard review. Of the 82 claims they add, 37 hold and 12 more hold with a caveat (our analysis) [4] [22].

OUR ANALYSIS

The definitions that hold include Dst [23] and its storm classes, such as −100 nT or below for a major storm [6] and −250 nT or below for a superstorm [24], NOAA's R, S and G scales and the flare classes [22], the glossary's 9 to 13 years for a single solar cycle, within the 9–14 years a review gives [25], the 22-year Hale cycle and the even-odd rule [26], coronal holes and the compressed fronts their fast streams drive [27], the surface field of 25,000–65,000 nT [28] and the total solar irradiance of about 1,361 W/m² [29]. So do many added claims: long-duration flares are likelier to come with a coronal mass ejection [4], cosmic rays peak near solar minimum [30], and storms can push the magnetopause in to geosynchronous orbit and beyond: Arase crossed it at 4.96 Earth radii in May 2024 [31], the storm that our check of a 2026 paper on its ring current covers.

Where the space-weather section goes wrong

ENTRY	THE GLOSSARY SAYS	WHAT THE REFERENCE SHOWS	OUTCOME
Coronal mass ejection	A shockwave cloud "blasted from the sun by a solar flare or an erupting plasma filament", the thunder to the flare's lightning [1 p. 2]	The belief that flares cause CMEs "has since been disproven"; CMEs often come without flares, and both are parts of one magnetic eruption [6] [32]. Erupting filaments are closely associated with CMEs [6]	Contradicted, for the flare
Equatorial electrojet	Forms from the equatorial ion fountain [1 p. 3]	It comes from the E-region dynamo and the enhanced conductivity at the magnetic equator; the fountain is an F-region uplift [7]	Contradicted
Galactic cosmic rays; Earth's core	The most penetrating reach Earth's mantle or core [1 p. 3]	Even TeV muons stop within a few kilometres of rock; only neutrinos, which hardly interact, pass through the Earth [8]	Contradicted
Plasma filament	Filaments "can weigh trillions of tons" and, with flares, trigger CMEs [1 p. 5]	Prominence masses are about 10^{14} to 2×10^{15} g [10]; NOAA puts a CME's load at "billions of tons" [33]; flares don't trigger CMEs [6]	Contradicted
Stream limit	A proton storm plateaus because the CME's own magnetism holds back further increases [1 p. 7]	The plateau comes from waves the streaming protons themselves generate; the later shock peak is real [34]	Contradicted (the second punch holds)
Flux transfer event	A solar energetic particle event is an extreme version of it [1 p. 3]	Flux transfer events are brief links at the magnetopause, about every eight minutes [35]; particle events are accelerated at flares and CME shocks [34]	Contradicted
Umbra and penumbra	The penumbra is "an electric effect at the surface" [1 p. 7]	A region of strongly inclined magnetic field whose filaments carry the Evershed flow [36]	Contradicted
Bow shock	Passes up to 11% of solar-wind energy on, which "current models leave out" [1 p. 1]	No source is given for 11%, and we found none; global models include the bow shock and are used to study its share [37]	Contradicted
Solar EMP; X-rays	A great storm's pulse would destroy grids and electronics; a big flare's X-rays would cause "an instant EMP" [1 p. 6] [1 p. 8]	NOAA's worst level lists grid collapse and transformer damage, not electronics destroyed wholesale [22]; we found no evidence for a flare pulse at the ground	Overstated; unsupported
Halo CME	A CME headed toward Earth [1 p. 4]	A halo can come from the front or the back of the Sun [4]	Holds with a caveat

The Kp claim is in section 4. Every row is in the hosted table, with its reason and source (section 11).

4 · NUMBERS STATED AS FACT

The glossary's most striking numbers don't survive a check

None of these numbers comes with a source. We checked each against the standard reference for it, and ran two tests of our own, with rules written before we looked at the data.

Kp 8+ against Kp 5

THE GLOSSARY

1,000–10,000×

how much more powerful it says a Kp 8+ storm can be than a Kp 5 storm [1 p. 5]

THE DISTURBANCE OUR ANALYSIS

5–10×

Kp 8+ is ap 236 on the standard table, 4.9 times Kp 5's 48 (5o) or 6.1 times its 39 (5−); Kp 9o, ap 400, is 8.3 or 10.3 times [9]

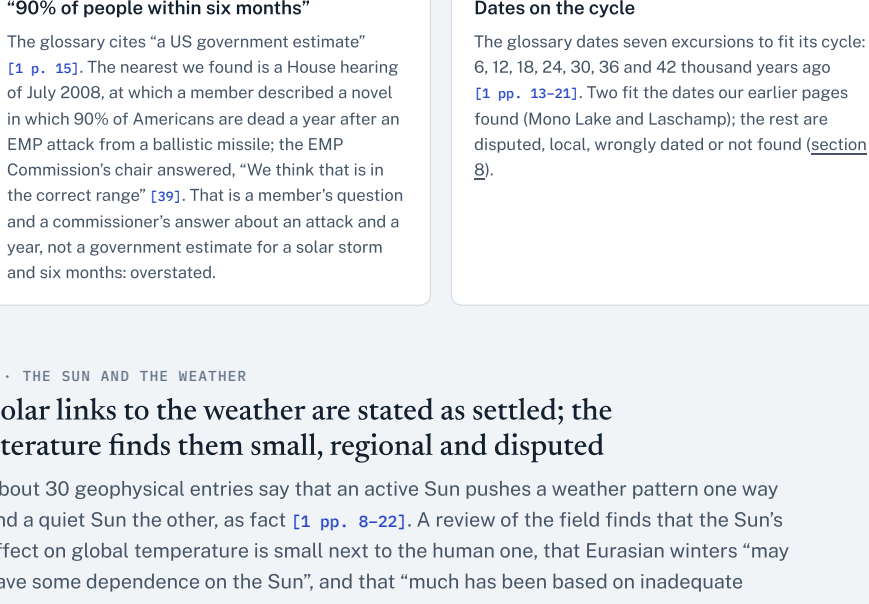
EVEN SQUARED OUR ANALYSIS

70–105×

the largest ratio, Kp 9o against Kp 5, squared as an energy would scale: about 70 with Kp 5 read as 5o, about 105 with 5−; the ring current's energy of May 2024 against a moderate storm is about 8×

Kp is a quasi-logarithmic index of a 3-hour range of disturbance, given in thirds of a unit, so that 5− is 4⅔; the ap index converts it back to an equivalent range [9]. The ring current's energy goes with the depth of Dst, and May 2024 reached about −406 nT in Kyoto's provisional index (our check of a May 2024 paper), against the −50 nT the glossary gives for a moderate storm. By the rule we fixed in advance, with Kp 5 taken as 5o, every ratio stays below 100 and the claim is contradicted; with 5−, the squared ratio is about 105, which the same rule would call overstated. Even on that reading the claim is about 10 to 100 times too large.

The Carrington event and a 7 °C spike



Our analysis of HadCRUT5's global monthly series, version 5.0.2.0 (Met Office Hadley Centre and Climatic Research Unit; © British Crown Copyright, Met Office; Open Government Licence v3.0) [11]. From September 1859 to February 1860 no month sits more than 0.14 °C above the mean of the 36 months before, −0.40 °C; the series' own 95% range in those years is about ±0.2–0.3 °C.

OUR ANALYSIS

The glossary says the 1859 storm "caused a temperature spike of about 7°C lasting a few months" [1 p. 22], without saying where. Our test speaks to the global and hemispheric means. To lift the global mean by 1 °C, the threshold we fixed in advance, a 7 °C spike would have to cover about a seventh of the globe. The largest month is +0.14 °C, within the month-to-month scatter of the three years before (standard deviation 0.13 °C); the Northern Hemisphere's is +0.12 °C, and HadCRUT5's current version, released in September 2026 after the one we used, gives +0.16 °C and +0.12 °C [11]. The Central England series, the longest instrumental temperature record, for a patch of England between Lancashire, London and Bristol, shows no warm spike either: all six months were cooler than their average over the ten years before [12]. These three checks were added after a fresh review and were not fixed in advance. A global series can't exclude a spike over a region up to about the size of Europe, some 2% of the globe, and the glossary names no region. The same entry says Carrington's auroras "were matched only by the May 2024 storm": the 1872 and 1921 storms took the auroral oval farther toward the equator, and 1958 and 1959 about as far as 2024 (our check of a May 2024 paper). A reappraisal of 1859 puts its lowest auroral sighting at about 18° geomagnetic latitude, and May 1921's at 15.3°, the lowest credible sighting on record [38 §2.2.2.1].

The other numbers

"Trillions of tons"

Prominence masses measured from hydrogen and helium lines run from about 10^{14} to 2×10^{15} grams [10], 0.1 to 2 billion tonnes: about a thousand times less than the glossary's figure. NOAA puts even a coronal mass ejection's load at "billions of tons" [33]. The filaments' lengths, many Earth diameters, hold.

"5% per decade"

The glossary credits ESA's Swarm director with a speed-up from 5% a century to 5% a decade, and adds "about 5% every eight years" now [1 p. 15]. Stop 6 of our video check rated the Swarm attribution False, and our check of S0's field-loss figures found the dipole losing 0.46% a decade since 2014.

"90% of people within six months"

The glossary cites "a US government estimate" [1 p. 15]. The nearest we found is a House hearing of July 2008, at which a member described a novel in which 90% of Americans are dead a year after an EMP attack from a ballistic missile; the EMP Commission's chair answered, "We think that is in the correct range" [39]. That is a member's question and a commissioner's answer about an attack and a year, not a government estimate for a solar storm and six months: overstated.

Dates on the cycle

The glossary dates seven excursions to fit its cycle: 6, 12, 18, 24, 30, 36 and 42 thousand years ago [1 pp. 13–21]. Two fit the dates our earlier pages found (Mono Lake and Laschamp); the rest are disputed, local, wrongly dated or not found (section 8).

5 · THE SUN AND THE WEATHER

Solar links to the weather are stated as settled; the literature finds them small, regional and disputed

About 30 geophysical entries say that an active Sun pushes a weather pattern one way and a quiet Sun the other, as fact [1 pp. 8–22]. A review of the field finds that the Sun's effect on global temperature is small next to the human one, that Eurasian winters "may have some dependence on the Sun", and that "much has been based on inadequate statistics and non-robust procedures" [13].

The main solar–weather claims, against the literature

GLOSSARY CLAIM	WHAT THE LITERATURE SHOWS	OUTCOME
An active Sun drives the NAO, the annular modes, the jet stream and the westerlies positive, lagging the cycle by 1–4 years	A lagged NAO-like response after solar maximum was reported [40]; a later study found no solar signal in the NAO before the mid-1960s and a marginal one since [41]	Overstated
The AMO's warm phase brings a wetter North America; its cool phase, drought	The reverse: in warm phases most of the US gets less rain, including the droughts of the 1930s and 1950s [14]; recent US droughts came with a warm AMO [42]	Contradicted
An active Sun drives the AMO positive	One proxy study finds solar and volcanic forcing paced it after the Little Ice Age [43]; its drivers remain debated	Overstated
An active Sun shifts the PDO positive	A review explains the PDO as tropical forcing plus North Pacific air–sea processes; its abstract names no solar driver [44]	Unsupported
More solar activity favours El Niño; minima favour La Niña; the ends of solar cycles line up with ENSO's swings	One team reports that the ends of solar cycles line up with switches from El Niño to La Niña [45]; but the main model study finds a La Niña-like response at solar peaks [46], and the coincidence can arise by chance [47]	Overstated
Low solar activity brings more blocking	Solar activity shifts where blocks form, but its effect on blocking frequency over the whole Atlantic is negligible [48]	Overstated
Stratospheric warmings come more often at solar minimum	In winters with westerly QBO winds, no major midwinter warming occurred with sunspot numbers below about 100; with easterly winds they occurred whatever the cycle [15]	Contradicted
Cosmic rays make more cloud seeds, so low solar activity brings more clouds, rain and cyclones	Ions do speed up particle formation [49], but cosmic-ray variations "do not appreciably affect climate through nucleation" [16]	Contradicted
Climate models use total irradiance as their only solar input	The solar forcing for the latest model round includes spectral irradiance and, for the first time, particles [17]; only some models use the particles (note n1, Overstated)	Overstated
CO_2 plays a secondary role to the Sun	Greenhouse gases warmed the planet by 1.0–2.0 °C since 1850–1900; natural drivers, solar and volcanic, changed it by −0.1 to +0.1 °C [50]	Contradicted
The Little Ice Age, about 1300 to 1850, came during ultra-low solar activity	It contains two deep solar minima, the Spörer and the Maunder, but its most prominent cold spell began, and its last one came, during relatively high solar activity, and several of its cooling steps track volcanic eruptions; a 2017 study finds no credible case for simple cause and effect [51 §2] [51 §4]	Overstated
Solar activity modulates the monsoons over decades and centuries	Stalagmites from Oman tie monsoon swings over decades to centuries to solar activity [52] [53]; the routes the glossary adds are its own	Holds with a caveat

"Overstated" here means some published basis, stated as settled. The hosted table rates the rest of these entries: Hadley cells, the trade winds, the Aleutian Low, storm tracks, hurricanes, the MJO, the ITCZ, sea temperature and precipitation.

6 · THE SUN AND THE CRUST

Storm currents are far too weak to melt rock, stress faults or set off earthquakes

Several entries say solar storms drive currents into faults and the "low-velocity zone" beneath the crust, triggering earthquakes, and that a large enough storm, or the micronova, could melt that layer and unlock the crust [1 pp. 11–17]. The U.S. Geological Survey says a causal link between space weather and earthquakes "has never been demonstrated" [20], and a test across magnitudes found none [21].

OUR ANALYSIS

The three numbers

We took a storm's electric field in the ground as 1 to 20 V/km; the largest 100-year field estimated for the US Mid-Atlantic is 24 V/km [54], and repeating the tests at that value changes nothing.

- **Heat.** Joule heating in a partly molten layer is at most 4×10^{-4} W/m³ at 20 V/km, and 6×10^{-4} W/m³ at 24 V/km. A day of it falls tens of millions of times short of melting the rock; even in the most generous case, with the least heat needed to melt it, doing so in 24 hours would take fields of 120–1,200 V/m, some 5,000 to 50,000 times the largest 100-year estimate.
- **Squeeze.** The piezoelectric stress in even an ideally oriented quartz crystal is at most about 0.005 Pa, at least 100,000 times below the stresses of the solid Earth's tides.
- **Push.** The force of the field on the induced currents is at most about 10^{-6} N/m³, some 10^{10} times less than the rock's own weight.

The inputs, conductivities from dry to melt-rich rock and textbook values for quartz and melting, are stated in the rules file. No plausible change in them closes a gap of this size.

Where the layer is, and what it does

The glossary puts the low-velocity zone between the crust and the mantle, calls it the Earth's most conductive layer and says it "glues the crust to the mantle" [1 p. 15]. It lies in the mantle, under a rigid lithosphere averaging at least 80 km thick over much of the Earth, and it is the weak layer on which the plates move [55]. A partly molten layer conducts well next to the rock around it [56], but the iron core [57] and seawater conduct far better.

All the way to the core?

The glossary says storms induce currents "all the way down" to the core and that the most energetic cosmic rays reach it [1 p. 11]. Storm-time variations of 14 hours to four months are what geophysicists use to sound the mantle [58]; we found nothing showing that they drive currents in the core, under 2,900 km of conducting rock. Cosmic-ray muons stop within kilometres [8].

These claims belong with the disaster cycle in the verdict panel: the site has rated claims of a Sun–earthquake link False or Unsupported before (stop 2 of our video check, and our check of S0's 2015 paper on the Sun's polar fields and earthquakes). The glossary's "pre-earthquake signals", radon and ionospheric anomalies among them, are studied, but none has produced a successful short-term forecast [59]: overstated.

7 · HEALTH AND BIOLOGY

Health effects are stated as settled; the studies are small, observational and point both ways

The glossary tells readers that heart rate variability "drops" when solar activity is high [1 p. 1] and that storms, cosmic-ray surges and strong flares "raise cardiac, stroke, seizure, migraine, anxiety and mood risks" [1 p. 7], with no hedge. Of its 14 health and biology rows, 12 are stated as fact and 2 attributed to the book; 8 are overstated, 2 unsupported and 4 hold, two of them on the UV that ozone loss lets through.

The health and biology claims

GLOSSARY CLAIM	WHAT THE EVIDENCE SHOWS	OUTCOME
Heart rate variability drops with solar activity, "a sign of cardiac stress"	Higher Kp went with lower variability in 809 older men [18]; higher solar radio flux and cosmic rays went with higher variability in 16 people [19]	Overstated
Storms raise cardiac, stroke, seizure, migraine, anxiety and mood risks	Associative studies; deaths a fraction of 1% higher per standard deviation of geomagnetic activity (storms and the brain, mortality)	Overstated
Very quiet and very stormy conditions are both health risks	A few ecological studies tie quiet years or cosmic rays to deaths, weakly; unconfirmed (mortality)	Overstated
Storms disrupt the body clock; ELF and ULF fields alter its genes	The gene effect we found is one cell-culture study at 0.1 mT and 50 Hz [60], about a hundred times the largest storm-time swings at the ground, at a power-line frequency	Overstated
Sunlight drives the body clock	Light is the main signal that sets it [60]	Holds
The Schumann resonance is a pathway from space weather to the brain (attributed to the book)	The resonance is real, near 8 Hz [61 §1]; we found no evidence for the pathway	Unsupported
Animals navigate by the field; as it weakens, navigation fails and the food chain is at risk	Many animals do use the field, and robins orient in a field a tenth of their local one after hours of exposure; we found no forecast of widespread failure (our check of a bat study)	Holds; unsupported
With less ozone, more UV reaches the surface and damages DNA, plants, plankton and insect eyesight (two entries)	UV-B, which the ozone layer blocks, damages DNA, plants and marine life [62]; we did not check insect eyes	Holds

8 · THE DISASTER CYCLE

The framework terms rest on claims this site has already found false

80 rows belong to S0's framework: a disaster cycle every 6,000 years, an excursion or pole shift under way, a solar micronova, the galactic current sheet and a 90° turn of the crust with its "great waves" [1 pp. 8–24]. 69 are contradicted, 6 unsupported, 3 overstated and 2 not checkable. 67 of the 80 are stated in the glossary's own voice, as fact.

The framework, theme by theme, and the earlier verdicts it rests on

THEME	GLOSSARY ENTRIES	EARLIER VERDICTS ON THIS SITE
A 6,000-year cycle	Earth disaster cycle; Geomagnetic excursion; Paleomagnetism; Heinrich events; Dansgaard-Oeschger events; the excursions' pairings	FALSE "Excursions come about every 6,000 years" (guide); stop 3 and stop 5
Under way now; a flip in the 2040s	Earth disaster cycle; Geomagnetic excursion; Geomagnetic reversal; Magnetic field weakening; Pole shift; Tipping point (March 2023)	FALSE "An excursion is under way now" (guide); stop 10, Unsupported; "Final acceleration has begun", False (November 11); extra x3, Misread
The trigger	Galactic current sheet; Galactic trigger; Galactic dust; Galactic magnetic reversal; Accretion; Magnetic kick; Solar micronova; Four horsemen sequence	UNSUPPORTED stop 14; FALSE stop 15; note n15, Misread; note n9, False
The tilt and its waves	Crust tilt; Great earthquake; Great waves; Inertial wave; Slosh-back wave; New poles; Safe zones; Surge deposits; Frozen mammoths; Arctic dinosaur eggs; Ohmic heating; Low-velocity zone	FALSE "Earth turns over 90° in a day" (guide); stop 17; note n8; our check of ECDO's Earth flip
Extinctions and isotopes	Extinction-level event; Geomagnetic reversal; Nova-level isotopes; Disaster layers	FALSE "Excursions take out much of life" (guide); stop 4; stop 16
What the elites know	They Know; Project Nanook; Elite bunkers; Clown World	UNVERIFIED note n7, Project Nanook; CONTEXT note n12

The glossary also ties ozone loss to the weakening field; our review of October 24 rated "Weak field explains ozone hole" False (October 24), and our check of the 2026 ozone season covers this year's hole.

The excursions the glossary places on its cycle

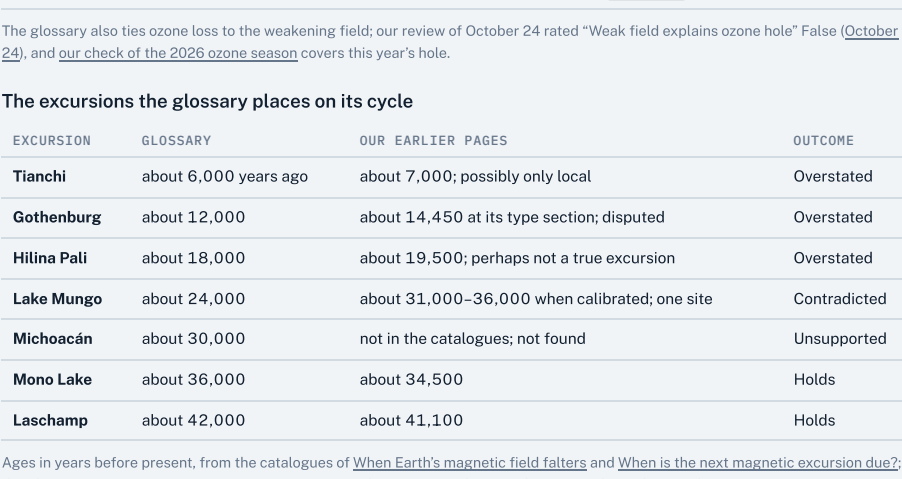
EXCURSION	GLOSSARY	OUR EARLIER PAGES	OUTCOME
Tianchi	about 6,000 years ago	about 7,000; possibly only local	Overstated
Gothenburg	about 12,000	about 14,450 at its type section; disputed	Overstated
Hilina Pali	about 18,000	about 19,500; perhaps not a true excursion	Overstated
Lake Mungo	about 24,000	about 31,000–36,000 when calibrated; one site	Contradicted
Michoacán	about 30,000	not in the catalogues; not found	Unsupported
Mono Lake	about 36,000	about 34,500	Holds
Laschamp	about 42,000	about 41,100	Holds

Ages in years before present, from the catalogues of When Earth's magnetic field falters and When is the next magnetic excursion due?; the glossary's ages are from its entries [1 pp. 13–21]. The pairings with Heinrich events fail too: those iceberg surges came 7,000–15,000 years apart, and only during the last ice age (stop 5).

9 · WHERE IT IS CAREFUL

Where the glossary is standard, careful or open about whose view it gives

A fair reading starts with what holds: 150 of its entries open with a standard definition, and 92 of its 309 checkable claims hold, 33 with a caveat.



Each bar is one section's checkable claims, the number beside its name (our analysis; every row is in the hosted table). The space-weather section is mostly sound; the Earth Disaster Cycle sections are mostly not.

OUR ANALYSIS

What holds

Beyond the space-weather basics (section 3): fresh water in the Beaufort Gyre rose about 40% [63]; ozone loss lets through UV-B that harms DNA and plants [62]; an 88-year Gleissberg cycle shows in radiocarbon [64]; the equinox effect's link to the tilt of Earth's axis, which the glossary attributes to "the book", fits the Russell–McPherron effect, which turns on Earth's dipole tilt and which a 2020 study finds behind almost all of the semi-annual variation in average activity, though not in the largest storms [65 §1.1] [65 §6]; the Last Glacial Maximum [66] and the Laschamp and Mono Lake excursions (see the catalogues in When Earth's magnetic field falters and When is the next magnetic excursion due?) are dated about right; polar mesospheric echoes have become slightly more frequent (extra x4); and sudden stratospheric warmings do favour cold outbreaks [67].

OUR ANALYSIS

Whose view it gives

21 claims are attributed to "the book" rather than asserted, and several of the book's own ideas are labelled as such: "the book's term", "the book's answer". The galactic "superwave" is presented as a rival explanation, with the book's reasons for rejecting it, and the entry on the Texas "rock wall" mentions the mainstream view that it is natural, before saying that the book rejects it. A 1909 study supports that view: the "wall" is a set of disconnected sandstone dikes, and the iron-stained sand between their joints was "mistaken for mortar" [68 pp. 690–691] [69]. But 67 of the 80 framework claims, and 12 of the 14 health and biology claims, are stated in the glossary's own voice.

Some claims rest on a real study but stretch it: the Grand solar cycle of "roughly 400 to 440 years" is near the 350–400-year cycles one group's dynamo model proposes [70], but isotope records show such long cycles only intermittently [25]; urban stations do bias raw US temperature trends, but adjustment removes the bias for recent decades [71]; and Heinrich events followed a slowdown of Atlantic overturning and subsurface warming, not simply surface warming [72]. One entry runs into a real study head on: young dinosaurs from northern Alaska, at the highest palaeolatitude known for dinosaurs, above 75°, show that they bred there and probably lived there all year [73]. So the region was polar then, against both the entry's premise that dinosaurs could not have lived in the Arctic and the book's answer that it was not polar.

10 · LIMITS

What this review can and can't show

Our classification

Sorting 238 entries into 481 rows is judgement, made under rules written in advance by one reader; the hosted table lets anyone check each row. A row's outcome speaks to the claim as the glossary words it.

Abstracts and records

Many papers were read as abstracts only; each source says so. The sites of four open papers refused our client: Owens and colleagues (2017), Cliver and Dietrich (2013), Lockwood and colleagues (2020) and Price (2016). The site's owner had supplied Cliver and Dietrich's on November 11, for another page, and supplied the other three after publication, with a 1909 paper from JSTOR; we read all five in full and checked the rows that rest on them, and one outcome changed, on the Little Ice Age (section 5).

The book is unread

We checked the glossary, not the book it summarizes, which neither it nor CRA names.

The glossary can change

We read the PDF fetched on November 13, 2026 (its SHA-256 is in source 1), and the same file was served again later that day. A later version may differ.

Unfound sources

We found no source for the bow shock's "11%", a "60–200%" rise in particle precipitation, an "F4 layer", a "Michoacan excursion", a "Heinrich-Bond solar cycle" or "rare cosmological event crystals". Those numbers and names are unsupported, not disproven. Where an entry adds a claim we could test, its row is rated on that: that "current models leave out" the bow shock's share, that ozone loss is the main effect of the extra particles, that the low-latitude F3 layer is new, and that a 6,000-year cycle exists.

What would change these verdicts

01 Sources for the unsourced numbers, such as the bow shock's 11% or the precipitation rise, would move those rows.

02 A robust, repeated detection of solar signals in the NAO, ENSO or the PDO would turn some "overstated" rows into "holds with a caveat".

03 An excursion recognized worldwide about 6,000 years ago, or a measured start of one now, would reopen the framework rows, which rest on this site's earlier verdicts.

11 · THE FULL TABLE AND OUR NUMBERS

Every row, our rules, our scripts and their outputs; the glossary itself stays with CRA

The table lists every entry by name with its class, our outcome, our one-line reason and our source; it carries none of the glossary's definitions. The scripts fetch their inputs by URL under a plain client name and check each against the copy we used [1] [9] [11] [12].

TSV **glossary-terms.tsv · glossary-sources-key.tsv**
All 481 rows: entry, section, term, row, class, how the glossary carries the claim (asserted, hedged or attributed), outcome, our reason and our source code; and the key to the codes, with what we read of each source · 114 KB

TXT **RULES_classify.txt · RULES_classify_amendment1.txt**
How entries are counted and claims classified and rated, written before any definition was read, and the one amendment, written before any row was classified · 11 KB

TXT **RULES_kp_ratio.txt · RULES_crust_forces.txt · RULES_carrington_temperature.txt**
The three tests, fixed before they ran · 5 KB

PY **count_terms.py · kp_ratio.py · carrington_temperature.py**
The count (it needs pdftotext); Kp against the NCEI table, with the reading of Kp 5 as 5−, which the rules didn't fix; HadCRUT5 around 1859 · 10 KB

PY **crust_forces.py · crust_forces_sensitivity.py · carrington_regional.py**
The three crust numbers; then two checks added after the run and not registered: the crust numbers at 24.29 V/km, and the Northern Hemisphere, HadCRUT5's current version and Central England around 1859 · 10 KB

TXT **count_terms.txt · kp_ratio.txt · carrington_temperature.txt · crust_forces.txt · crust_forces_sensitivity.txt · carrington_regional.txt**
Their outputs · 6 KB

TXT **HASHES.txt**
The SHA-256 of every file here; the rules files are byte for byte as registered · 2 KB

When each rule was fixed, on November 13, 2026 (UTC)

RULES FILE	REGISTERED	BEFORE
RULES_classify.txt	16:08	any definition was extracted or read; the PDF was fetched at 16:06
RULES_classify_amendment1.txt	16:30	any row was classified or checked; after the count and one reading
RULES_kp_ratio.txt	16:30	any ratio was computed; the NCEI page had been fetched at 16:14
RULES_crust_forces.txt	16:30	any number was computed; its inputs are fixed in the file
RULES_carrington_temperature.txt	16:30	any temperature data were fetched

Five departures. The crust rules call 20 V/km more than the largest storm-time field reported, but Love and colleagues estimate a 100-year extreme of 24.29 V/km at one site [54]; `crust_forces_sensitivity.py`, added after the run and not registered, repeats the tests at that value, and nothing changes. The rules also cite NERC's benchmark of 8 V/km, which we did not re-read, so the page compares with Love and colleagues' figure instead. The temperature rules justify their 1 °C threshold by saying that a 7 °C spike in any large region would lift a global or hemispheric mean by well over 1 °C; that is wrong, since the spike would have to cover about a seventh of the globe, or of a hemisphere. The decision stands as registered, and after a fresh review we added the checks in `carrington_regional.py`, which the rules did not fix. The Kp rules read Kp 5 as 5o; read as 5−, the largest squared ratio is about 105, which the same rule would call overstated. Two rows on UV damage to DNA, plants and plankton were classed B, though rule 2 puts effects on plants and animals in D; a fresh review caught it, and we moved them to D after checking, which rule 2.5 does not provide for. Three definitions were moved from class A to B when checked, as rule 2.5 provides: the halo CME, "umbral magnetic fields" and ion-induced nucleation.

Run it

In an empty folder `<base>`: `python3 -I count_terms.py <base>` (needs pdftotext, from Poppler or Xpdf), `python3 -I kp_ratio.py <base>`, `python3 -I carrington_temperature.py <base>` and `python3 -I carrington_regional.py <base>` fetch their inputs and say whether they match ours; `python3 -I crust_forces.py` and `python3 -I crust_forces_sensitivity.py` need no input. Each output should match its .txt file. The PDF and its text stay in your folder: the glossary has no licence, so we don't host them.

Related checks

- FALSE Every 6,000 years? The Disaster Cycle, Fact-Checked
- UNSUPPORTED The galactic current sheet The Disaster Cycle, Fact-Checked
- FALSE A solar micronova? The Disaster Cycle, Fact-Checked
- OVERSTATED Particles "left out of climate models" The Disaster Cycle, Fact-Checked
- UNSUPPORTED The Sun and volcanoes The Disaster Cycle, Fact-Checked

Sources

Bracketed numbers refer to this list. For the Observer Glossary [1], p. is a page of the PDF, and its entries are named in the text; CRA's page [2] is cited as a whole; for S0 News of November 13 [3], locators are times in the video, from the automatic transcript. For papers, § is a section and p. a page. Where only an abstract was read, the entry says so. The hosted table's source codes are explained in glossary-sources-key.tsv. nT is the nanotesla; ap is the Kp index converted back to an equivalent range of disturbance. Links checked November 13, 2026.

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2 Catastrophism Research Association (2026). Glossary, the page that links the Observer Glossary. Retrieved November 13, 2026, at 16:06 UTC, with the SHA-256 d782735f0ca83bf6077863c84979f619fabafcaebd52fa37b7b94ab006f6cf66. Its About, Researchers, Library and FAQ pages were read too, for the book's title, which none gives. © 2026 Catastrophism Research Association LLC; quoted, not hosted.

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METHOD

How this was checked

On November 13, 2026, we checked the Observer Glossary [1] entry by entry. We counted its 238 entries twice, by two methods; sorted its definitions and claims into 481 rows of five classes, under rules written before any definition was read; matched the 150 entries that open with a standard definition to NOAA's glossary and scales, the AMS Glossary of Meteorology and standard reviews, 147 of them to a reference we read; and checked its 309 checkable claims against this site's earlier verdicts (151 of them rest at least partly on those), the literature and three tests of our own. We checked the episode's sentence about the glossary against its transcript [3 00:03:39–00:03:44]. Every other statement on this page was checked against its source, 73 sources in all.

The verdicts and the items tagged "Our analysis" are our own assessment, built on the cited sources: the count, the classification, each row's outcome, the Kp ratio, the temperature test and the crust estimates. Each test's rules were written and hashed before it ran. One amendment to the classification rules, on S0's own coinages, advice and counting, was written after the count and before any row was classified. Three checks were added after the runs: the crust estimates at 24.29 V/km; the Kp ratio with Kp 5 read as 5−; and the Northern Hemisphere, HadCRUT5's current version and the Central England series around 1859. All are labelled, and section 11 lists the departures from our rules.

We recomputed everything in Python's standard library, apart from the PDF's text, which pdftotext extracts; the rules, the scripts and their outputs are in section 11, and the hosted scripts reproduce our outputs exactly. Many papers were read as abstracts only, as their entries say. The sites of four open papers refused our client and were not retried; the site's owner had supplied one on November 11, for another page, and supplied the other three after publication, and we read all four in full (see below). We didn't read the book the glossary summarizes, which neither it nor CRA names, and we didn't see the episode's graphics.

After the page was built, a fresh reviewer who hadn't seen the drafting counted the entries with their own parser, re-checked 42 rows drawn at random against the glossary and their sources, recomputed our three tests in separate code, re-ran the hosted scripts, and checked every quotation, locator and reference. The changes that followed: we corrected the premise of our temperature rules, since a 7 °C spike would have to cover about a seventh of the globe to lift the global mean by 1 °C, and added the regional and current-version checks; the Kp ratio is given on both readings of Kp 5; the count of standard definitions now says what they were matched against, after we read 13 more entries of the AMS Glossary; two rows on UV damage moved to the health class, and one row's outcome was corrected from a caveat to contradicted; the hosted table gained the column that says how the glossary carries each claim; and about twenty smaller fixes of wording, figures, quotations and locators were made. While checking, we found that the HadCRUT5 version we had used was superseded in September 2026; the current one gives the same result. No verdict changed.

After the page was published, the site's owner supplied three of the four open papers whose sites had refused our client, Owens and colleagues (2017) [51], Lockwood and colleagues (2020) [65] and Price (2016) [61], and, from JSTOR, Paige's paper of 1909 on the Texas "rock wall" [68]. The fourth, Cliver and Dietrich (2013) [38], had been supplied on November 11 for another page, and we had not used it here. We read all five in full and checked against them the 20 rows that rest on them, or that had rested on abstracts or our earlier pages in their place: the equinox effect, the Schumann resonance and the ELF band, the rock wall, grand solar minima and the Little Ice Age, and the Carrington event and superflares. One outcome changed: that the Little Ice Age came "during ultra-low solar activity" is now rated overstated, where it had held with a caveat, since its most prominent cold spell began, and its last one came, during relatively high solar activity [51 §4]. Sixteen rows now cite these papers, with section or page locators, and one reason was corrected: the flare of 2003 that released about 6 × 10^{32} erg was the X17 flare of 28 October, not a November one. No verdict changed.

This page was researched and written with Claude, an AI assistant made by Anthropic, and then re-checked against its sources in a separate verification pass.

The verdicts on this page

FALSE	The evidence contradicts the claim.
OVERSTATED	Has some basis but claims much more than the evidence supports.
UNSUPPORTED	No evidence we could find backs it up, though it hasn't been strictly disproven.
UNVERIFIED	We couldn't find the source or record it depends on.
PARTLY TRUE	Part of the claim holds up and part doesn't.
TRUE	The evidence supports the claim.
CONTEXT	A question or aside rather than a claim. We add the facts it leaves out.

All ten verdicts, and how we check

CORRECTIONS

Corrections and changes

If we get something wrong, we fix it and record the change below with the date. If a correction changes a verdict, the log says what the old verdict was.

Change log

Nov 14, 2026	Revised the day after publication: the site's owner supplied three of the four open papers whose sites had refused our client, on the Little Ice Age, the equinox effect and the Schumann resonances, and a 1909 paper on the Texas "rock wall"; the fourth, on the 1859 storm, had been supplied on November 11 for another page and was not used here before publication. We read all five in full and checked the 20 rows that rest on them. One outcome changed: the Little Ice Age's "ultra-low solar activity" is now rated overstated, where it had held with a caveat, so 212 of the 309 checkable claims are overstated, contradicted or unsupported, not 211. Sixteen rows now cite these papers, a row on the Little Ice Age was added to section 5, and one reason was corrected: the 2003 flare measured at about 6 × 10^{32} erg was the X17 flare of 28 October. No verdict changed.
Nov 13, 2026	Published on factchecked.science after a full check against the sources. The six verdicts group the glossary's 309 checkable claims; every row, with its outcome, reason and source, is in the hosted table. A fresh review the same day changed no verdict: it led us to correct the premise of our temperature test and add regional checks, to give the Kp ratio on both readings of Kp 5, to say what the standard definitions were matched against, to move two biology rows to the health class and correct one row's outcome, to host the carriage column, and to make about twenty smaller fixes.

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