EVIDENCE REVIEW · S0 NEWS RESEARCH NOTE

S0's field note: the numbers reproduce, 'since 1800' is modelled, and the pole is slowing

S0 News's research note 007 computes the South Atlantic Anomaly, the north magnetic pole and Earth's dipole from two standard field models, and its title says that since 1800 the anomaly has deepened by 7,100 nT and grown almost sixfold and the pole has sped up tenfold [1 Title]. Every number we compared reproduces from the public model files [4][5], and two other models agree from 1840 on [8][9] (our analysis). The field's strength in 1800 was never measured; the model assumes it [4 p. 967], and the published rates for the dipole's fall before 1840 put the anomaly's deepening at 6,500–7,250 nT and its growth at 4.5 to 6.0 times, with the note's figures towards the upper end (our analysis). The pole was fastest in 2002, not in the 2010s, and has slowed since 2016 [9]; S0's special report, describing a chart that matches the note's Figure 3, saw growing jumps toward a pole shift where the chart shows a model's five-year steps [3 00:01:57–00:02:12] (our analysis).

By Fact-Checked Science · Published November 9, 2026

OUR ANALYSIS marks our own reasoning and calculations: our recomputation of the note's numbers from the public model files; the comparisons with COV-OBS.x2, CHAOS-8.7, NOAA's pole positions and the ground surveys; the test of IGRF-14's five-year steps; and our reading of what the note and S0's special report do and don't show. The verdicts are our assessment. Everything else comes from the numbered sources. For the note [1], locators are its own section names; for the report [3], times in the video. nT is the nanotesla, the unit of field strength; the axial dipole, $|g_1^0|$, is the field's largest term; the north dip pole is where the field points straight down.

The note's numbers reproduce and its 1800 start is modelled; the north magnetic pole is slowing, and the report's readings of two charts are false or misleading

OUR ASSESSMENT

82 of 82

of our comparisons with the note's numbers agree, from the public model files: 75 at our first pass, the rest once we matched its full method and fixed a slip of ours (our analysis) [4][5]

4.5–6.0×

how much the anomaly has grown since 1800 under the published rates for the dipole's fall before 1840 [15], [16] and [17 Introduction], which no measurement fixes; the note's 5.8× is among them, and since 1840 it is 3.9× (our analysis) [4][5]

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rises of more than 5 km a year in IGRF-14's yearly pole speed since 1900 fall where it joins two five-year epochs [5]; models that change continuously show none [8][9] (our analysis)

THE CLAIMS

TRUE

"Since 1800 the South Atlantic Anomaly has deepened by 7,100 nT and grown almost sixfold"

The note's title [1 Title]

True, but modelled. Both numbers come out of gufm1, the historical model the note uses: 7,144 nT and 5.76 times (our analysis) [4]. Its 1800 baseline is an assumption, not a measurement: before 1840 gufm1 fixes the dipole's strength by a fall of 15 nT a year [4 p. 967], as the note itself says [1 Methods: Models]. The published rates for that fall, from slight growth to 16 ± 2 nT a year, give about 6,500–7,250 nT and 4.5–6.0 times, so the note's figures lie inside the range, towards its upper end; counted from 1840, when the field's strength was measured, they are 5,959 nT and 3.9 times (our analysis). See section 3 and our check of the pre-1840 dipole.

MISLEADING

"the north magnetic pole has sped up tenfold"

The note's title, and its fourth claim [1 Title][1 Claims 4]

The title's present tense leaves out what the note's own abstract reports: the pole "now heads for Siberia at 37 km/yr" [1 Abstract]. In CHAOS-8.7 it has slowed from about 52 km a year in 2016–2017 to 37.6 in 2024–2025 (our analysis) [9], and it is forecast to slow further [28 §1.6 p. 21]. Tenfold was true of the early 2000s: about 58 km a year in the continuous models [8][9] against gufm1's average of 5.5 km a year in the 1800s, a modelled figure, since the pole was surveyed only once in that century, in 1831, and next in 1904, 46 km away [11 Table 5] (our analysis). Today it is 6.7 times. The note's peak, 58.5 km a year in 2010–2011, is a step in IGRF-14's five-year interpolation; that changes the peak's date, not the multiple, and the IGRF-14 paper puts the peak in 2002.5 [6 §4]. See section 4.

TRUE

Since 1840 the anomaly has deepened by 5,959 nT, grown 3.9 times and moved west into South America, and the dipole moment has fallen 9.5%

The note's first three claims [1 Claims 1–3] and its fifth [1 Claims 5], in our words

These reproduce to the digit (our analysis) [4][5], and two other models agree: COV-OBS.x2 and CHAOS-8.7 put the weakest field within 80 nT, and the area within 1.2 million km^2, of gufm1 and IGRF-14 at every date we checked [8][9]. In every decade since 1800 the anomaly's weakest point was deeper and further west, and its area wider; its deepening since 2000, 32 nT a year, is slower than in 1840–1900, as the note says [1 Claims 1]. See section 3.

MISLEADING

"SAA growth has been linked to a possible geomagnetic excursion or reversal [7]."

The last line of the note's abstract [1 Abstract]

The sentence is accurate and hedged: the paper it cites is titled "The South Atlantic Anomaly: The Key for a Possible Geomagnetic Reversal", and finds two of the three signs of a coming transition that it lists [18 Discussion]. What misleads is what the sentence leaves out. The same paper finds the dipole moment "not so low" against the Holocene and the Brunhes, though falling at a rate like that of past reversals or excursions [18 Abstract]; a later study of past excursions infers that the field is not in the early stage of a reversal or excursion [21]; and another finds anomalies like this one recurring over 9,000 years, with this one likely to disappear within a few hundred years [24 Abstract]. See section 6.

FALSE

"These accelerative jumps with the slight exhale of a slowdown in between have gotten bigger and bigger. One more of those is what we're worried about. If we get another amplification of this pattern, like the last three cycles, it is the final acceleration, meaning we would be just 5 to 10 years away."

S0's special report, describing a chart of the pole's speed that matches the note's Figure 3 [3 00:01:57–00:02:12]

The steps' shape and timing come from how IGRF-14 is built: all six rises of more than 5 km a year since 1900 fall where it joins two five-year epochs [5], and two models that change continuously show none [8][9] (our analysis). In those models, which are smooth by construction, the pole sped up through the 1990s, more sharply in the surveys, to about 58 km a year in 2002, then wavered with smaller and smaller crests, and has slowed since about 2016. Since 2002, nothing has grown "bigger and bigger", and the pole's speed is no measure of a pole shift. See sections 4 and 7.

MISLEADING

"Not only should it be plainly obvious that the field loss rates down there at the bottom are getting wonky, but what's next in this pattern? Another accelerative rise. And what happens when we get another one? And what if it's even bigger?"

S0's special report, describing a dual chart that matches the note's Figure 5 [3 00:02:32–00:02:46]

The axial dipole's rate of loss has risen and fallen since measurements began: about 30 nT a year in 1915–1920, 8 in 1945–1950, 24 in 1980–1985 and 7.6 in 2015–2020 (our analysis) [5]. The recent rise is real: in CHAOS-8.7 the loss roughly doubled, from 6.5 nT a year over 2018–19, a yearly mean, to 12.7 in 2025–26 [9]. But it brings the loss back to its 1999–2014 pace, as IGRF-14 forecast (12.6), well below the 1910s and the 1970s–80s; the note's own figure has the 20th century as the fastest [1 Figure 5]. Nothing in the record points to an ever bigger rise. See sections 5 and 7.

1 · WHAT THE NOTE COMPUTED

Two field models, one global grid, every 1 January since 1590

S0 News's research note 007, credited to an "internal GrokBot Team 007", computes three features of Earth's magnetic field at sea level from two published models: the South Atlantic Anomaly, where the field is weakest; the north dip pole, where the field points straight down; and the dipole, the field's largest part [1 Abstract]. S0 News published it as a Google Doc, and S0's special report of November 9, 2026 linked it [1][3].

STEP 1

Two models

gufm1, a model of four centuries of historical records of the field, to 1900 [4]; the International Geomagnetic Reference Field, IGRF-14, from 1900, with its forecast for 2025–2030 [5]. Before 1840, gufm1 "holds the axial dipole to 15 nT/yr", a trend its makers adopted [1 Methods: Models][4 p. 967].

STEP 2

One grid

Each 1 January, the field's strength on a 0.25° grid at sea level on the WGS84 ellipsoid; the weakest point, refined; the area below 32,000 nT joined to it, and that area's centre [1 Methods: Grid and pole].

STEP 3

The pole

The point north of 55°N where the field is vertical, and its speed: the great-circle distance from one 1 January's position to the next [1 Methods: Grid and pole].

STEP 4

Checks

The two models compared over 1900–1990 [1 Methods: Splice and checks], and the poles against NOAA's yearly positions [10] and the ground surveys.

In the note's words Its source [6] is Barraclough's analyses of 1974 [14], and its [1] is gufm1's paper [4].

> *"Pre-1840 gufm1 holds the axial dipole to 15 nT/yr (Barraclough 1974 [6]; no absolute intensities before 1832 [1])."*
>
> The note [1 Methods: Models]

> *"IGRF-14 yearly speed is step-shaped from 5-yr interpolation."*
>
> The note [1 Methods: Grid and pole]

> *"Grey: pre-1840 strength from gufm1's fixed dipole trend (no absolute intensities before 1832 [1])."*
>
> The note, on its Figure 1 [1 Figure 1]

What the note reports

In 1800 the weakest field was 29,215 nT, in the South Atlantic, and in 2025 it was 22,071 nT, over northern Argentina, 54° further west; the area below 32,000 nT had grown from 19.0 to 109.1 million km^2, 5.8 times. The north magnetic pole averaged about 5 km a year in the 1800s and 10 km a year through most of the 20th century, peaked at 58.5 km a year in 2010–2011 and now moves at 37 km a year. The dipole moment fell 9.5% from 1840 to 2025 [1 Abstract]. In 1800 the weakest point lay about 350 km south of St Helena [1 Claims 3].

Open about its methods

The note states its methods precisely, flags its pre-1840 assumption in its abstract, claims and figures, and gives an alternative for 1800 from the slower trend of Gubbins and colleagues [1 Abstract][15]. It checks its poles against NOAA's and the surveys, says that IGRF-14's yearly speeds are step-shaped, and its numbers show the pole slowing and the anomaly deepening more slowly since 2000 than in 1840–1900 [1 Claims 1]. It hasn't been peer reviewed, and its data folder asked for a Google sign-in when we checked; we don't sign in [2].

2 · THE NUMBERS REPRODUCE

All 82 comparisons come out of the public model files

We rebuilt the note's grids and poles in our own code from the same public files, following its stated methods, with the rules of our tests fixed and hashed before any model was run (our analysis) [4][5].

OUR ANALYSIS

We computed the field every 1 January from 1590 to 2030, as the note describes, after checking our code against NOAA's 12 official test values for the World Magnetic Model, which it matches to within 0.05 nT [30]. At the first pass, 75 of our 82 comparisons agreed with the note to the precision it gives. Five of the other seven follow from rescaling the whole 1800 field, as Gubbins and colleagues' own method does (our check of their paper describes it); changing the dipole alone gives 28,670 nT, not the note's 28,759 [1 Abstract]. One came from reading the note's "sphere alternate" range, 22–78 nT, over the full 1590–2030 span its abstract gives (from 1800 it is 22–58 nT) [1 Methods: Grid and pole]. And one was a sign slip in our own first-pass table: the note's "−2.6%" at the 1900 join is IGRF-14's area against gufm1's, consistent with its "+22 nT" [1 Methods: Splice and checks]. A second script, in Python's standard library, recomputes 59 of the 82 again (section 9).

The note's numbers beside ours, a selection

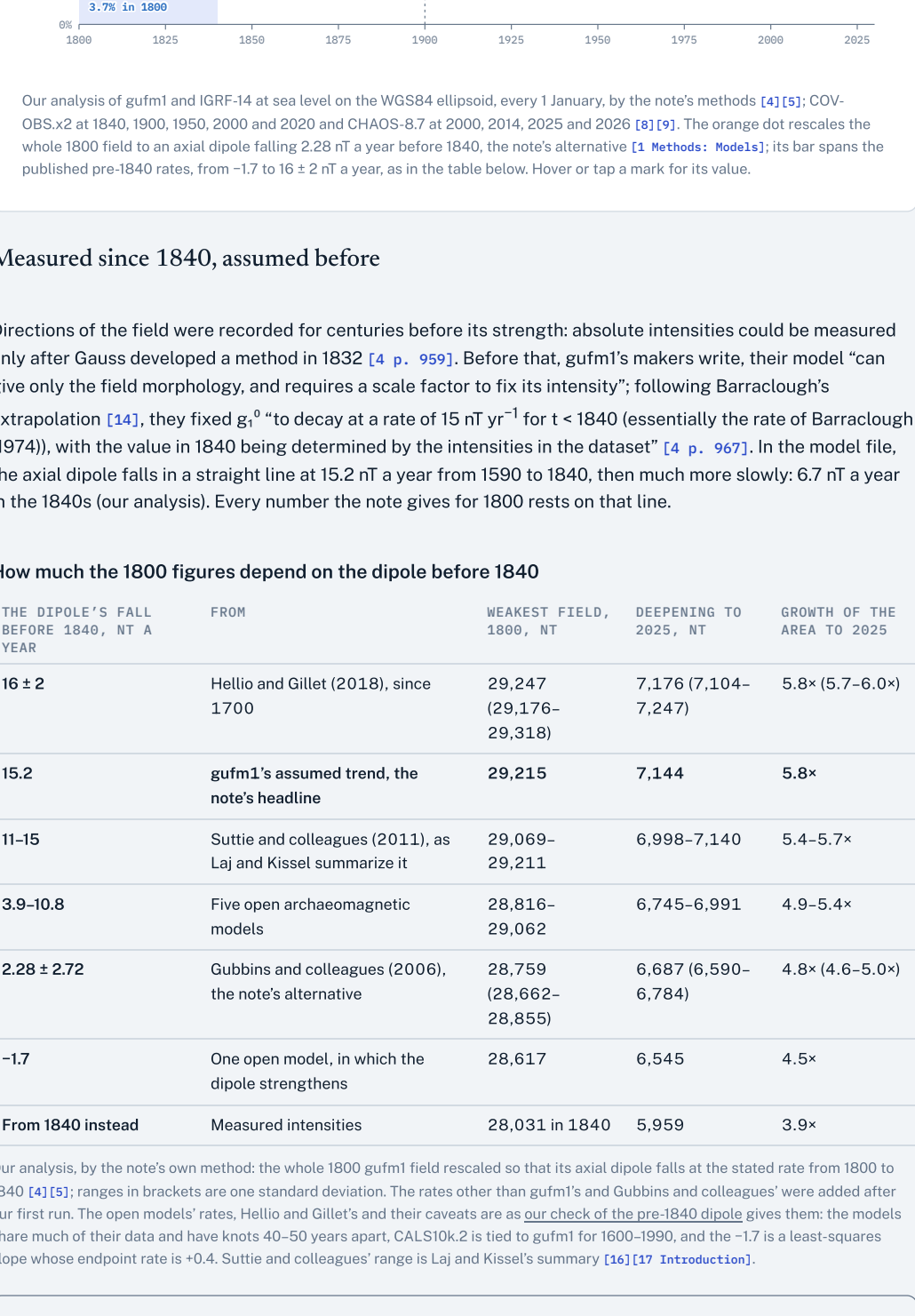
WHAT	THE NOTE	OURS	WHERE IN THE NOTE
Weakest field: 1800, 1840, 1900, 2000, 2025, 2030 (nT)	29,215; 28,031; 25,422; 22,874; 22,071; 21,907	29,215.0; 28,030.7; 25,422.1; 22,873.9; 22,071.4; 21,907.4	Claims 1
Area below 32,000 nT: 1800, 1840, 1900, 2025, 2030 (million km^2)	19.0; 28.3; 46.0; 109.1; 112.2	18.96; 28.34; 45.97; 109.12; 112.21	Claims 2
The weakest point: 1800; 2025	19.0°S 6.3°W; 26.2°S 60.0°W	18.99°S 6.30°W; 26.22°S 60.03°W	Claims 3
The area's centre: 1800; 2025	5.9°W; 48.5°W	5.93°W; 48.47°W	Claims 3
Pole speed (km/yr): 1800s mean; 1900–1989 mean; 2000–01; 2010–11; 2015–16; 2024–25; 2029–30	5.5; 10.0; 55.7; 58.5; 55.2; 36.6; 29.9	5.47; 10.01; 55.68; 58.49; 55.18; 36.60; 29.86	Claims 4
The pole: closest in 2018; position in 2025	86.59°N; 85.73°N 138.6°E	86.593°N; 85.727°N 138.616°E	Claims 4
The pole's path since 1990; since 1900 (km)	1,603; 2,504	1,602.7; 2,503.5	Claims 4
Dipole moment: 1840, 1900, 2015, 2025 (10^{22} A m^2)	8.50; 8.32; 7.72; 7.69	8.496; 8.322; 7.724; 7.690	Claims 5
Axial dipole's fall (nT/yr): 1600–1840, 1840–1900, 1900–1950, 1950–2000, 2000–2025; 2015–2020, 2020–2025	15.20, 12.05, 19.78, 18.69, 10.78; 7.61, 10.68	15.20, 12.05, 19.78, 18.69, 10.78; 7.61, 10.68	Figure 5
The slower alternative for 1800: weakest field; area	28,759 nT; 22.8 million km^2	28,758.5; 22.76	Abstract
The 1900 join: weakest field; area; pole	+22 nT; −2.6%; 71 km	+22.5; −2.62%; 71.4	Methods: Splice and checks
Against NOAA's poles: 1590–1891; 1900–2018 (km)	≤2.4; ≤2.2	2.35; 2.14	Methods: Splice and checks

Our analysis of gufm1 and IGRF-14 [4][5], and of NOAA's yearly poles [10]; the note's values as printed [1]. The note prints the 1800–2025 weakening as 24.4%; ours is 24.45%. All 82 comparisons, and the 59 that the hosted script recomputes, are in the files of section 9. We didn't check the note's own comparisons with a Python package (ppigrf) and with a gufm1 snapshot.

3 · THE ANOMALY

Deeper, wider and further west every decade; how much since 1800 depends on a modelled baseline

In both models the weakest field has fallen, and the area below 32,000 nT has grown, in every decade since 1800, while the low point moved from south of St Helena to northern Argentina (our analysis) [4][5]. The measured part of the record begins in 1840.



Our analysis of gufm1 and IGRF-14 at sea level on the WGS84 ellipsoid, every 1 January, by the note's methods [4][5]; COV-OBS.x2 at 1840, 1900, 1950, 2000 and 2020 and CHAOS-8.7 at 2000, 2014, 2025 and 2026 [8][9]. The orange dot rescales the whole 1800 field to an axial dipole falling 2.28 nT a year before 1840, the note's alternative [1 Methods: Models]; its bar spans the published pre-1840 rates, from −1.7 to 16 ± 2 nT a year, as in the table below. Hover or tap a mark for its value.

Measured since 1840, assumed before

Directions of the field were recorded for centuries before its strength: absolute intensities could be measured only after Gauss developed a method in 1832 [4 p. 959]. Before that, gufm1's makers write, their model "can give only the field morphology, and requires a scale factor to fix its intensity"; following Barraclough's extrapolation [14], they fixed g_1^0 "to decay at a rate of 15 nT yr^{-1} for t < 1840 (essentially the rate of Barraclough (1974)), with the value in 1840 being determined by the intensities in the dataset" [4 p. 967]. In the model file, the axial dipole falls in a straight line at 15.2 nT a year from 1590 to 1840, then much more slowly: 6.7 nT a year in the 1840s (our analysis). Every number the note gives for 1800 rests on that line.

How much the 1800 figures depend on the dipole before 1840

THE DIPOLE'S FALL BEFORE 1840, NT A YEAR	FROM	WEAKEST FIELD, 1800, NT	DEEPENING TO 2025, NT	GROWTH OF THE AREA TO 2025
16 ± 2	Hellio and Gillet (2018), since 1700	29,247 (29,176–29,318)	7,176 (7,104–7,247)	5.8× (5.7–6.0×)
15.2	**gufm1's assumed trend, the note's headline**	**29,215**	**7,144**	**5.8×**
11–15	Suttie and colleagues (2011), as Laj and Kissel summarize it	29,069–29,211	6,998–7,140	5.4–5.7×
3.9–10.8	Five open archaeomagnetic models	28,816–29,062	6,745–6,991	4.9–5.4×
2.28 ± 2.72	Gubbins and colleagues (2006), the note's alternative	28,759 (28,662–28,855)	6,687 (6,590–6,784)	4.8× (4.6–5.0×)
−1.7	One open model, in which the dipole strengthens	28,617	6,545	4.5×
From 1840 instead	Measured intensities	28,031 in 1840	5,959	3.9×

Our analysis, by the note's own method: the whole 1800 gufm1 field rescaled so that its axial dipole falls at the stated rate from 1800 to 1840 [4][5]; ranges in brackets are one standard deviation. The rates other than gufm1's and Gubbins and colleagues' were added after our first run. The open models' rates, Hellio and Gillet's and their caveats are as our check of the pre-1840 dipole gives them: the models share much of their data and have knots 40–50 years apart, CALS10k.2 is tied to gufm1 for 1600–1990, and the −1.7 is a least-squares slope whose endpoint rate is +0.4. Suttie and colleagues' range is Laj and Kissel's summary [16][17 Introduction].

OUR ANALYSIS

So the note's 7,144 nT and 5.76 times sit inside the range the published rates allow, towards its upper end: about 6,500–7,250 nT and 4.5–6.0 times. Gubbins and colleagues found the dipole nearly steady from 1590 to 1840 [15]; a re-analysis of the errors in the same kind of data argues that the decline began well before 1840, at about 11–15 nT a year since 1590, as Laj and Kissel sum it up [16][17 Introduction]; and Hellio and Gillet propose 16 ± 2 nT a year since 1700, as our check of the pre-1840 dipole reports. No measurement decides between them, so "since 1800" is modelled, but nothing in the evidence shows the headline wrong. Since 1840, on measured intensities, the anomaly has deepened by 5,959 nT and grown 3.9 times.

In other models

COV-OBS.x2, built from observatory, survey and satellite records since 1840, and CHAOS-8.7, built from satellite and observatory data since 1999, agree with the note's numbers. In COV-OBS.x2 the weakest field was 27,970 nT in 1840, 25,348 in 1900, 22,876 in 2000 and 22,229 in 2020, within 80 nT of gufm1 and IGRF-14, and the area grew 3.7 times from 1840 to 2020 [8]. CHAOS-8.7 has 22,070 nT and 21.4% of Earth's surface in 2025, and 22,038 nT in 2026, where IGRF-14 forecast 22,038 (our analysis) [9]. Satellite data show the same growth: from 2014 to 2025 the area below 26,000 nT grew by 0.9% of Earth's surface [26 Abstract], "an area nearly half the size of continental Europe" [27].

A long-lived anomaly, drifting west

Hartmann and Pacca traced the anomaly's centre through gufm1 and IGRF from 1590 to 2005: about 70° west and 12° south in 415 years, about 0.17° a year [19 The anomaly center and its path], while its intensity fell by about 8,500 nT, faster after 1750 [19 Intensity]. In 2020 the CHAOS-7 team reported a secondary minimum south-west of Africa, linked to reversed flux under South Africa, and tied the main anomaly's continued growth to reversed flux gathering under South America [20 Abstract].

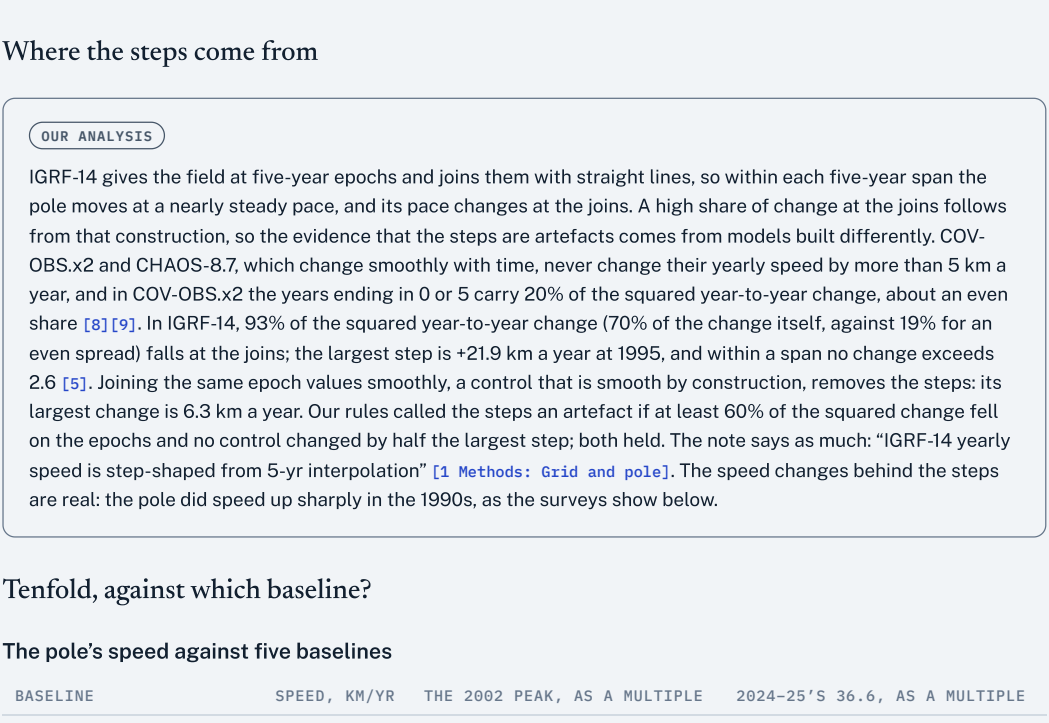
"Weakening in its two best-known features"?

The note's abstract opens: "Earth's magnetic field is weakening in its two best-known features" [1 Abstract]. It doesn't name them. If they are the anomaly and the dipole, the opening holds: both are weakening (section 5). If they are the anomaly and the north magnetic pole, the two subjects of the note's title, it holds for the anomaly only: the pole is a place, not a strength, and the field there fell from about 61,300 nT in 1840 to 57,000 nT in 2000, but has strengthened since, to 57,700 nT in 2025, with 58,100 forecast for 2030, as the pole moved toward the stronger field over Siberia (our analysis) [4][5]. Livermore and colleagues trace the pole's run toward Siberia to the weakening of one lobe of the field under Canada, as seen at the surface [13 Abstract]. We don't rate the sentence.

4 · THE NORTH MAGNETIC POLE

The steps' shape and timing come from how IGRF-14 is built; the pole was fastest in 2002 and is slowing

The note's yearly speeds of the north dip pole reproduce exactly, steps and all [1 Claims 4]. Models that change smoothly with time show the pole speeding up in the 1990s, peaking in 2002 and slowing since about 2016 [8][9] (our analysis).



Our analysis: the north dip pole at sea level on the WGS84 ellipsoid, every 0.1 year, where the horizontal field is zero, and its speed as the great-circle distance between positions on a sphere of 6,371.0 km. IGRF-14 runs to spherical-harmonic degree 10 before 2000 and 13 after [5], COV-OBS.x2 to 14 and CHAOS-8.7 to 20 [8][9]. The control joins IGRF-14's epoch values with a smooth (not-a-knot cubic) curve instead of straight lines. Faint vertical lines mark IGRF-14's five-year epochs. Survey means from Newitt and colleagues' Table 6 [11 Table 6]. Hover or tap a survey bar for its value.

AT IGRF'S JOINS · OUR ANALYSIS

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rises of more than 5 km a year in IGRF-14's yearly speed since 1900 fall where it joins two five-year epochs [5]; COV-OBS.x2 and CHAOS-8.7 have none [8][9]

THE REAL PEAK · OUR ANALYSIS

58 km/yr

in 2002, in COV-OBS.x2 and CHAOS-8.7; IGRF-14's yearly 58.5 in 2010–2011 follows a step at its 2010 epoch, and CHAOS-8.7 has 51.6 for that year [8][9]

NOW · OUR ANALYSIS

37 km/yr

in 2024–2025 (IGRF-14 36.6, CHAOS-8.7 37.6), down from about 52 in 2016–2018; IGRF-14 forecasts 29.9 for 2029–2030 [5][9]

Where the steps come from

OUR ANALYSIS

IGRF-14 gives the field at five-year epochs and joins them with straight lines, so within each five-year span the pole moves at a nearly steady pace, and its pace changes at the joins. A high share of change at the joins follows from that construction, so the evidence that the steps are artefacts comes from models built differently. COV-OBS.x2 and CHAOS-8.7, which change smoothly with time, never change their yearly speed by more than 5 km a year, and in COV-OBS.x2 the years ending in 0 or 5 carry 20% of the squared year-to-year change, about an even share [8][9]. In IGRF-14, 93% of the squared year-to-year change (70% of the change itself, against 19% for an even spread) falls at the joins; the largest step is +21.9 km a year at 1995, and within a span no change exceeds 2.6 [5]. Joining the same epoch values smoothly, a control that is smooth by construction, removes the steps: its largest change is 6.3 km a year. Our rules called the steps an artefact if at least 60% of the squared change fell on the epochs and no control changed by half the largest step; both held. The note says as much: "IGRF-14 yearly speed is step-shaped from 5-yr interpolation" [1 Methods: Grid and pole]. The speed changes behind the steps are real: the pole did speed up sharply in the 1990s, as the surveys show below.

Tenfold, against which baseline?

The pole's speed against five baselines

BASELINE	SPEED, KM/YR	THE 2002 PEAK, AS A MULTIPLE	2024–25'S 36.6, AS A MULTIPLE
gufm1, the 1600s	5.1	11.4×	7.2×
gufm1, the 1700s	7.8	7.5×	4.7×
gufm1, the 1800s	**5.5**	**10.7×**	**6.7×**
Ground surveys, 1904–1973	9.1–9.3	6.3×	4.0×
IGRF-14, 1900–1989	10.0	5.8×	3.7×

Our analysis [4][5], with the continuous models' peak of 58.3 km a year; survey means from Newitt and colleagues [11 Table 6].

The 1800s are slower in gufm1 than the 1700s (7.8 km a year) or the 20th century (10.0); only the 1600s, at 5.1, were slower (our analysis) [4]. Only one survey located the pole in the 19th century, Ross's in 1831; the next, Amundsen's in 1904, found it 46 km away [11 Table 5], and between them gufm1's path, south to 69.2°N and back, 372 km in all, is a model inference. Its makers note that "when there is little information injected from the data, the solution is controlled by the prior information" [4 p. 983]. The surveys tell the 20th century's story directly: about 9 km a year from 1904 to 1973, 11 and 15 km a year to 1994, then 51.5 and 52.0 [11 Table 6]. "The motion of the NMP was relatively constant up to 1994, at which time an intense acceleration occurred", and by 2007 "it appears likely that the NMP is no longer accelerating" [11 §4][11 §5]. Measured between surveys, the 1990s rise is sharper than either model shows: 14.9 km a year over 1983.9–1994.0, then 51.5 over 1994.0–2001.0 [11 Table 6], against 18.2 and 44.0 between the same dates in both COV-OBS.x2 and IGRF-14 (our analysis).

Fastest in 2002, slowing since 2016

The IGRF-14 paper has the pole "peaking at 56 km/year in 2002.5" and forecasts 31 km a year in 2027.5 [6 §4]. Chulliat and colleagues described the same rise from about 15 km a year in 1989 to about 60 in 2002, followed by a slight decrease [12 Abstract]. The World Magnetic Model expects "a faster (yet gradually decelerating) drift of the north dip pole, at about 35 km/year" over 2025–2030 [28 §1.6 p. 21], and in December 2025 its makers put the pole's average speed at 36 km a year, easing to "just above 30 km/year by the end of the decade" [29 p. 3][29 p. 12]. The IGRF's makers add that past forecasts "have often over-or underestimated the dip pole velocity" [6 §4].

Why the dip pole moves so fast

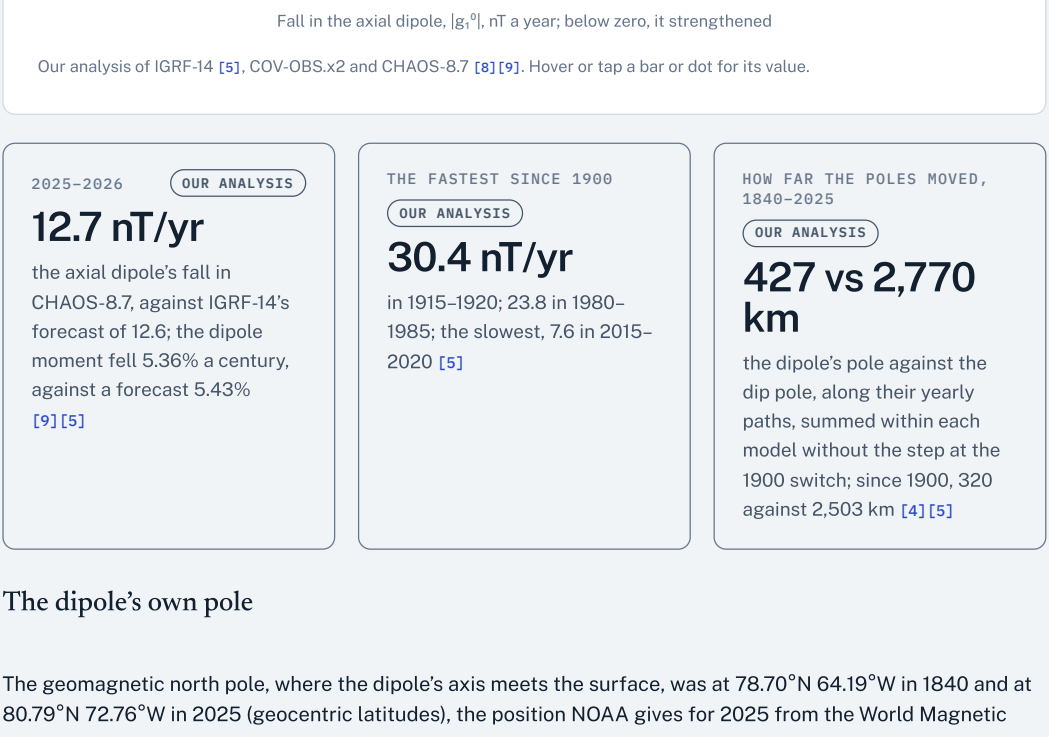
Livermore and colleagues show that the pole's position over the last two decades has been set largely by two lobes of magnetic flux at the top of the core, under Canada and Siberia. The Canadian lobe stretched out, probably through a change in the core's flow between 1970 and 1999, which weakened its signature at the surface and sped the pole toward Siberia; the pole crossed the date line in late October 2017, passing within 390 km of the geographic pole [13 Abstract]. On 1 January 2018 IGRF-14 has it at 86.59°N, 379 km from the pole (our analysis) [5]. The dipole's own pole moved far less (section 5).

Our conventions throughout: positions at sea level on the WGS84 ellipsoid, on 1 January (every 0.1 year for the chart), where the horizontal field is zero to within 0.001 nT; speeds as great-circle distances on a sphere of 6,371.0 km between consecutive positions. Degrees: gufm1 14; IGRF-14 10 before 2000 and 13 after; COV-OBS.x2 14; CHAOS-8.7 20, with 13 as a check, which changes its yearly speeds by less than 3 km a year.

5 · THE DIPOLE

The dipole has lost 9.5% since 1840, at a pace that rises and falls, and its pole has barely moved

The dipole moment fell from 8.50 to 7.69 × 10^{22} A m^2 between 1840 and 2025, 9.5%, as the note says [1 Claims 5]; COV-OBS.x2 gives 9.3% for 1840–2020 (our analysis) [8].



Our analysis of IGRF-14 [5], COV-OBS.x2 and CHAOS-8.7 [8][9]. Hover or tap a bar or dot for its value.

2025–2026 · OUR ANALYSIS

12.7 nT/yr

the axial dipole's fall in CHAOS-8.7, against IGRF-14's forecast of 12.6; the dipole moment fell 5.36% a century, against a forecast 5.43% [9][5]

THE FASTEST SINCE 1900 · OUR ANALYSIS

30.4 nT/yr

in 1915–1920; 23.8 in 1980–1985; the slowest, 7.6 in 2015–2020 [5]

HOW FAR THE POLES MOVED, 1840–2025 · OUR ANALYSIS

427 vs 2,770 km

the dipole's pole against the dip pole, along their yearly paths, summed within each model without the step at the 1900 switch; since 1900, 320 against 2,503 km [4][5]

The dipole's own pole

The geomagnetic north pole, where the dipole's axis meets the surface, was at 78.70°N 64.19°W in 1840 and at 80.79°N 72.76°W in 2025 (geocentric latitudes), the position NOAA gives for 2025 from the World Magnetic Model [10]. Along its yearly path it moved 427 km over 1840–2025, never faster than 6.8 km a year, while the dip pole moved 2,770 km, both summed within each model without the step at the switch from gufm1 to IGRF-14 in 1900 (320 and 2,503 km since 1900); the dip pole lay 12.3° from the dipole's pole in 1840, 6.5° in 2000 and 13.0° in 2025 [4][5]. So the dip pole's rapid run reflects changes in the field's finer structure, not the dipole tilting (our analysis); Livermore and colleagues trace it to the flux lobes under Canada and Siberia [13 Abstract].

6 · WHAT IT PORTENDS

A weak spot that recurs and drifts west; whether it heralds a reversal is argued both ways

The note ends its abstract on a link to a possible reversal [1 Abstract]. The paper it cites makes that case and weighs it, and later work leans the other way.

In the scientists' words The CMB is the core–mantle boundary; the Holocene, the last 12,000 years; the Brunhes, the last 780,000.

> *"The presence of the reversal patches at the CMB seems to be characteristic during the preparation phase of a geomagnetic transition."*
>
> Pavón-Carrasco and De Santis (2016) [18 Abstract]

> *"However, the current value of the dipolar moment (7.7 10^{22} A·m^2) is not so low when compared with recent paleomagnetic data for the Holocene (last 12 ka) and for the entire Brunhes geomagnetic normal polarity (last ~0.8 Ma), although the rate of decay is similar to that given by previous documented geomagnetic reversals or excursions."*
>
> The same paper [18 Abstract]

> *"The analogy implies that the South Atlantic Anomaly will likely disappear in next few hundred years, accompanied by a return to a more symmetric field configuration and possibly, a strengthening of the axial dipole field."*
>
> Nilsson and colleagues (2022) [24 Abstract]

The question is old. Hartmann and Pacca, in 2009, saw the anomaly as long-lived and governed by the field's non-dipole parts, mentioned the hypothesis that the field might be heading for a reversal, and left it to better models of the core [19 Conclusions]. Pavón-Carrasco and De Santis, in 2016, list three signs of a coming transition and conclude that two of them, reversed-flux patches and a long interval since the last reversal, agree with one. The third, a decaying dipole with a growing non-dipole field, they call "not clear": the dipole is falling faster than expected from geomagnetic diffusion, at a rate comparable with past reversals, but its moment, 7.7 × 10^{22} A m^2, is close to the Holocene average of 8.1 ± 1.6 and far above the ~3 of past excursions [18 Discussion]. Brown and colleagues, in 2018, compared today's field with past excursions and inferred that it is not in the early stage of a reversal or excursion [21]. Nilsson and colleagues, in 2022, found anomalies like this one recurring over 9,000 years, with an analogue that fades, though they note that today's dipole "is still decreasing without showing signs of slowing down, which is not consistent with the proposed ancient analog" [24 Discussion].

Weak spots recur in the region. Lavas on St Helena record unusually scattered directions 8 to 11 million years ago and a weak field 10 to 8 million years ago, which Engbers and colleagues, in 2020 and 2022, read as recurring weaknesses in the South Atlantic [22][23 Abstract]. A 2026 record from central South America tentatively traces a low-intensity anomaly moving west along a similar path in the first millennium CE, supporting a recurrent pattern [25 Abstract].

OUR ANALYSIS

Through the catastrophism lens. A weak spot that has come and gone in the same region for millions of years, drifting west at about 20 km a year, beside a dipole about as strong as the Holocene's average, is not a countdown. None of these papers dates an excursion. Halving today's dipole by 2045 would take a pace about 58 times IGRF-14's forecast, as our page on the next excursion finds, and our guide to Earth's magnetic field sets the anomaly and its effects, on satellites rather than on life on the ground, in context.

7 · THE REPORT'S READING

The charts the report describes match the note's Figures 3 and 5, which show neither a coming pole shift nor an ever-faster loss

The report describes two charts that match the note's Figures 3 and 5. We haven't seen its graphics, so we compare its words with the note's figures and our numbers [3 00:01:52–00:02:19].

In the report's words Our check of the whole report is on its own page.

> *"First, the magnetic north pole movement since the initiation of the pole shift."*
>
> S0's special report [3 00:01:52–00:01:57]

> *"Left side of the chart is flat for both when not much was happening."*
>
> S0's special report [3 00:02:19–00:02:23]

> *"Do you see that little blip there? That's the best scientist in the world's best guess made about 23 months ago."*
>
> S0's special report [3 00:02:47–00:02:54]

OUR ANALYSIS

Figure 3: steps, not jumps

The note's Figure 3 plots IGRF-14's yearly pole speed [1 Figure 3], which the note itself calls step-shaped. The steps' shape and timing come from the five-year joins (section 4). The last three upward steps, in 2000, 2010 and 2015 (+8.0, +9.6 and +6.7 km a year), were all smaller than 1995's (+21.9), and the levels they reached, 55.7, 58.5 and 55.2 km a year, show no sustained growth; the steps since, in 2020 and 2025, are down [5]. In models without steps, the crests after 2002 shrink: 57.8, 54.3 and 52.1 km a year in CHAOS-8.7 [9]. The transcript doesn't say what "5 to 10 years away" refers to; our page on the report looks at that horizon. And the dip pole's speed measures neither the dipole's strength nor an excursion (section 5).

OUR ANALYSIS

Figure 5: a forecast pace, not a surge

The flat left side is a single straight line, Gubbins and colleagues' fitted 2.28 nT a year, drawn across 1590–1840 with a band of one standard deviation that takes in zero and growth; the grey dashed line is gufm1's imposed trend [1 Figure 5][1 Methods: Models]. The "little blip" is very likely IGRF-14's forecast for 2025–2030, 12.6 nT a year, adopted in November 2024 by the working group V-MOD of the International Association of Geomagnetism and Aeronomy from many teams' candidate models, not one scientist's guess [6 Abstract][7]. CHAOS-8.7, with satellite data to August 2026, puts 2025–2026 at 12.7: the field is falling at the forecast pace, not faster [9]. What the report then pointed to ("what we are worried about here would be this") can't be seen in the transcript.

8 · LIMITS

What this check can and can't say

Our numbers are recomputations from public models, run under rules fixed before we started; the models themselves have limits (our analysis).

Before 1840, models, not measurements

Absolute intensities could be measured only from 1832, and gufm1 fixes its dipole before 1840 by an adopted trend [4 p. 967], so every figure for 1800 depends on it; the range of section 3 is as wide as the published reconstructions allow.

A model's pole in the 1800s

Only one survey located the pole in the 19th century, Ross's in 1831, and the next, Amundsen's in 1904, found it 46 km away; between them gufm1's path is a model inference [11 Table 5].

Smooth models

COV-OBS.x2 uses splines with knots two years apart and a statistical prior on how the field changes [8], and CHAOS-8.7 uses regularized splines and starts in 1999 [9]. Both smooth fast changes, so for IGRF-14's largest step, in 1995, COV-OBS.x2 is the only independent control, and the surveys show the 1990s rise more sharply than either.

How IGRF is built

IGRF-14 is linear between epochs, and its values after 2025 are a forecast [5][6 §4].

Our rebuild, not the note's code

The note's data folder asked for a sign-in, so we couldn't compare its tables or scripts [2]; our numbers come from our own code, checked against NOAA's test values [30].

Sources read in part

Eleven sources only as abstracts or significance statements: Gubbins and colleagues [15], Chulliat and colleagues [12], Livermore and colleagues [13], the CHAOS-7 paper [20], Brown and colleagues [21], whose page showed a bot check, Engbers and colleagues [22] and [23], Gómez-Paccard and colleagues [25], Finlay and colleagues in 2025 [26], and the papers behind COV-OBS.x2 [8] and CHAOS-8 [9]. Suttie and colleagues only by title [16], Laj and Kissel in their Introduction [17], and Barraclough [14] and the IGRF-14 evaluation [7] as records.

The report's graphics

We worked from the transcript; what the report showed on screen, and its "there" and "over there", can't be checked [3].

What would change these verdicts

01

A pre-1840 dipole fixed by new archaeointensity data. Today's range already includes the note's figures; a rate well outside it would change the first verdict. Our check of the pre-1840 dipole follows the evidence.

02

A renewed rise in the pole's speed in the next years of NOAA's record or the next World Magnetic Model report [10][29 p. 3].

03

The note's data folder made public, so that its tables could be compared with ours [2].

9 · REPEAT OUR NUMBERS

The rules, the scripts and the derived numbers; the note's files stay with S0 News

Every number of ours on this page comes from these files. The script fetches the public model files by URL under a plain client name and checks each against the copy we used [4][5]; we host only numbers we derived, none of the note's text, figures or data, and none of the model files.

PY **saa_pole.py**
Standard library only. The anomaly, the poles and the dipole every 1 January, 1590–2030, in gufm1, IGRF-14, COV-OBS.x2 and CHAOS-8.7; the 1800 figures under each published pre-1840 rate; the test of IGRF's steps; the surveys and NOAA's poles; the note's numbers against ours · 54 KB

JSON **saa-pole-numbers.json**
Every number of the run that made this page, with the inputs' SHA-256 · 31 KB

CSV **saa_yearly.csv · pole_speeds.csv · pole_speeds_fine.csv · axial_dipole_rates.csv**
The anomaly, the poles and the dipole year by year, 1800–2030; the pole's yearly speed in every model, 1590–2030; its speed every 0.1 year, for the chart; the axial dipole's five-year rates · 36 KB, 15 KB, 98 KB and 1 KB

TXT **RULES_reproduce.txt · RULES_independent.txt**
The rules of our tests, hashed at 18:27 UTC on November 9, 2026, before any model was evaluated · 5 KB and 5 KB

TXT **analysis_log.md · note_numbers_first_pass.md · HASHES.txt**
Our log, with the time and SHA-256 of every rules file, input and output, and what we added after the first run; the 82 comparisons as they stood at the first pass; the checksums of every file here · 15 KB, 6 KB and 2 KB

PY **fieldlib.py · validate.py · run_yearly.py · pole_fine.py · analyse_note.py · independent.py**
The numpy and scipy code we ran first, under the rules: the field library and its checks, the yearly grids, the 0.1-year poles, the comparison with the note, and the independent checks. They read the inputs from a folder laid out as in our log · 18 KB, 4 KB, 4 KB, 3 KB, 18 KB and 20 KB

PY **gubbins_scaled.py · sphere_range.py · rate_range.py · charts.py**
Added after the first run: the note's alternative for 1800, its sphere range and the 1800 figures under other pre-1840 rates (numpy); and the script that draws this page's charts from saa_pole.py's output · 2 KB, 1 KB, 2 KB and 16 KB

Run it

In an empty folder `<folder>`, `python3 saa_pole.py <folder>` fetches the seven input files, about 2 MB, checks each against the copy we used, and writes the outputs listed here; it took us about seven minutes. `--quick` skips the 1900–1990 comparison of the two models and the 0.1-year series; `--sphere` adds the note's sphere check, which gives 22.3–78.0 nT. Standard library only, Python 3.8 or later. The numpy code needs numpy and scipy.

Related checks

FALSE The 2025 model already failing? The Disaster Cycle, Fact-Checked

UNSUPPORTED A magnetic pole flip in the 2040s? The Disaster Cycle, Fact-Checked

FALSE 55% of the field gone? The Disaster Cycle, Fact-Checked

Sources

Bracketed numbers refer to this list. For S0 News's research note [1], locators are its own section names: Title; Abstract; Claims 1 to 5; Figures 1 to 5; and Methods with the paragraph's name (Models; Grid and pole; Splice and checks). For S0's special report [3], locators are times in the video, from the automatic transcript. For papers, § is a section and p. a page, numbered as in the version the entry names, and Abstract, Introduction, Discussion, Conclusions and Table are the parts read; for Hartmann and Pacca [19], locators are the article's own section names. Where only an abstract or a record was read, the entry says so. nT is the nanotesla; the dipole moment is in units of 10^{22} A m^2; km/yr is kilometres a year. Links checked November 9, 2026.

1 S0 News (Space Weather News) (undated). Since 1800 the South Atlantic Anomaly has deepened by 7,100 nT and grown almost sixfold, and the north magnetic pole has sped up tenfold. "Space Weather News Research Note from internal GrokBot Team 007", headed "SPACE WEATHER NEWS & RESEARCH PUBLICATIONS 2026". A public Google Doc, undated; retrieved November 9, 2026, at 18:19 UTC, when our text export had the SHA-256 08c4267fb5ec f20a532f2e1cef5f312de6ef7f9c93f9e8fd94d3af002213f7fe. Read in full, with its five figures. No licence is stated, so it is linked, not hosted, and none of its figures is redrawn. Not peer reviewed.

2 S0 News (Space Weather News) (undated). The note's "Drive CSV pack", with its data and scripts. When checked at 18:10 UTC on November 9, 2026, Google asked for a sign-in ("You must sign in to access this content"). We don't sign in, so we haven't read it; every number on this page is rebuilt from the public model files instead.

3 SpaceWeatherNews (S0) (November 9, 2026). SPECIAL REPORT: Pole Shift - Part 1. YouTube video, https://www.youtube.com/watch?v=m4S0pdDkgsk. Quoted from tactiq.io's automatic transcript, supplied by the site's owner; times are positions in the video. We didn't see the video's graphics. Reviewed on our page for the report.

4 Jackson, A., Jonkers, A. R. T., and Walker, M. R. (2000). Four centuries of geomagnetic secular variation from historical records. Philosophical Transactions of the Royal Society A 358(1768), 957–990. Read in full, from a copy supplied by the site's owner. With the model file gufm1.txt, 1590–1990, at the address the note gives (742,677 bytes on November 9, 2026), which states no licence; we host only numbers derived from it.

5 IAGA Working Group V-MOD (2024). International Geomagnetic Reference Field, 14th generation (IGRF-14): Gauss coefficients 1900–2025 and secular variation 2025–2030. Data file, NOAA National Centers for Environmental Information; retrieved November 9, 2026, the same file, by its SHA-256, as on our earlier pages. With the 13th generation's file, igrf13coeffs.txt. The files state no licence; we host only numbers derived from them.

6 Beggan, C. D., Kloss, C., Amblard, P., et al. (2026). International geomagnetic reference field: the fourteenth generation. Earth, Planets and Space 78, 127. CC BY 4.0. Read in full, on the publisher's site; also checked on our page on S0 News of October 20, 2026.

7 Beggan, C. D., Kloss, C., Grayver, A., et al. (2026). Evaluation of candidate models for the 14th generation International Geomagnetic Reference Field. Earth, Planets and Space 78, 126. CC BY 4.0. Record only (Crossref); the note's source [3].

8 Huder, L., Gillet, N., Finlay, C. C., Hammer, M. D., and Tchoungui, H. (2020). COV-OBS.x2: 180 years of geomagnetic field evolution from ground-based and satellite observations. Earth, Planets and Space 72, 160. The paper is CC BY 4.0; abstract read. With the model file COV-OBS.x2-int, 1840–2020, from DTU Space, whose page states no licence for it; we host only numbers derived from it.

9 Kloss, C., Finlay, C. C., Olsen, N., Tøffner-Clausen, L., Gillet, N., and Grayver, A. (2026). The CHAOS-8 geomagnetic field model. Earth, Planets and Space 78, 21. CC BY 4.0. Abstract read. With the core-field file of CHAOS-8.7, released September 30, 2026, with Swarm data to August 31, 2026 (doi:10.5281/zenodo.22959079), CC BY 4.0, from DTU Space's CHAOS-8 website.

10 NOAA National Centers for Environmental Information. Wandering of the Geomagnetic Poles, with its yearly north dip pole positions, 1590–2025 (NP.xy). Read November 9, 2026; the note's source [5].

11 Newitt, L. R., Chulliat, A., and Orgeval, J.-J. (2009). Location of the North Magnetic Pole in April 2007. Earth, Planets and Space 61, 703–710. CC BY 4.0. Read in full; the note's source [4].

12 Chulliat, A., Hulot, G., and Newitt, L. R. (2010). Magnetic flux expulsion from the core as a possible cause of the unusually large acceleration of the north magnetic pole during the 1990s. Journal of Geophysical Research 115, B07101. Abstract only, as deposited with Crossref; paraphrased.

13 Livermore, P. W., Finlay, C. C., and Bayliff, M. (2020). Recent north magnetic pole acceleration towards Siberia caused by flux lobe elongation. Nature Geoscience 13(5), 387–391. Abstract only, on the publisher's page; the note's source [8].

14 Barraclough, D. R. (1974). Spherical harmonic analyses of the geomagnetic field for eight epochs between 1600 and 1910. Geophysical Journal of the Royal Astronomical Society 36(3), 497–513. Record only (Crossref); the note's source [6].

15 Gubbins, D., Jones, A. L., and Finlay, C. C. (2006). Fall in Earth's magnetic field is erratic. Science 312(5775), 900–902. Abstract only, as deposited with Crossref; paraphrased. The note's source [9], and the subject of our check of the paper.

16 Suttie, N., Holme, R., Hill, M. J., and Shaw, J. (2011). Consistent treatment of errors in archaeointensity implies rapid decay of the dipole prior to 1840. Earth and Planetary Science Letters 304, 13–21. Title only; we give its finding as Laj and Kissel (2015) summarize it [17], as on our check of the field-loss figures.

17 Laj, C., and Kissel, C. (2015). An impending geomagnetic transition? Hints from the past. Frontiers in Earth Science 3, 61. CC BY 4.0. Its Introduction, as read for our check of the field-loss figures.

18 Pavón-Carrasco, F. J., and De Santis, A. (2016). The South Atlantic Anomaly: the key for a possible geomagnetic reversal. Frontiers in Earth Science 4, 40. CC BY 4.0. Read in full; the note's source [7].

19 Hartmann, G. A., and Pacca, I. G. (2009). Time evolution of the South Atlantic Magnetic Anomaly. Anais da Academia Brasileira de Ciências 81(2), 243–255. CC BY-NC 4.0. Read in full, on SciELO.

20 Finlay, C. C., Kloss, C., Olsen, N., Hammer, M. D., Tøffner-Clausen, L., Grayver, A., and Kuvshinov, A. (2020). The CHAOS-7 geomagnetic field model and observed changes in the South Atlantic Anomaly. Earth, Planets and Space 72, 156. CC BY 4.0. Abstract only, as deposited with Crossref; paraphrased.

21 Brown, M., Korte, M., Holme, R., Wardinski, I., and Gunnarson, S. (2018). Earth's magnetic field is probably not reversing. PNAS 115(20), 5111–5116. Its significance statement, as deposited with Crossref; paraphrased. The publisher's page showed a bot check, which we didn't attempt.

22 Engbers, Y. A., Biggin, A. J., and Bono, R. K. (2020). Elevated paleomagnetic dispersion at Saint Helena suggests long-lived anomalous behavior in the South Atlantic. PNAS 117(31), 18258–18263. Its significance statement, as deposited with Crossref; paraphrased.

23 Engbers, Y. A., Grappone, J. M., Mark, D. F., and Biggin, A. J. (2022). Low paleointensities and Ar/Ar ages from Saint Helena provide evidence for recurring magnetic field weaknesses in the South Atlantic. Journal of Geophysical Research: Solid Earth 127(3), e2021JB023358. CC BY 4.0. Abstract only, as deposited with Crossref; paraphrased.

24 Nilsson, A., Suttie, N., Stoner, J. S., and Muscheler, R. (2022). Recurrent ancient geomagnetic field anomalies shed light on future evolution of the South Atlantic Anomaly. PNAS 119(24), e2200749119. CC BY-NC-ND 4.0, quoted only; full text read at Europe PMC.

25 Gómez-Paccard, M., Pavón-Carrasco, F. J., et al. (2026). Tracing the origins and recurrence of the South Atlantic Anomaly: A 2000-year absolute paleointensity record from central South America. PNAS 123(20), e2536503123. CC BY-NC-ND 4.0. Abstract only, as deposited with Crossref; paraphrased.

26 Finlay, C. C., Kloss, C., and Gillet, N. (2025). Core field changes from eleven years of Swarm satellite observations. Physics of the Earth and Planetary Interiors 368, 107447. CC BY 4.0. Abstract, as in the record at DTU Orbit, as read for our guide to Earth's magnetic field.

27 European Space Agency (2025, October 13). Swarm reveals growing weak spot in Earth's magnetic field. News release, as quoted on our guide.

28 Chulliat, A., Brown, W., Nair, M., Gomez Perez, N., Young, L.-Y., Watson, C., Boneh, N., Beggan, C., Meyer, B., and Paniccia, M. (2025). The US/UK World Magnetic Model for 2025–2030: Technical Report. NOAA National Centers for Environmental Information. CC0. Its §1.6, as quoted on our page on S0 News of October 20, 2026.

29 NOAA National Centers for Environmental Information and British Geological Survey (2025). State of the Geomagnetic Field, December 2025. CC0. As quoted on our page on S0 News of October 20, 2026.

30 NOAA National Centers for Environmental Information and British Geological Survey (2024). World Magnetic Model 2025: coefficients and test values (WMM2025COF.zip). Data file, used to check our field code against NOAA's 12 official test values.

METHOD

How this was checked

On November 9, 2026, we checked S0 News's research note 007, its title, abstract, five numbered claims and figures, and the statements in its methods that carry weight. We checked them against the public files of the two field models it uses, gufm1 and IGRF-14, from which we rebuilt all 82 of the numbers we compared; against two further models, COV-OBS.x2 and CHAOS-8.7, NOAA's pole positions and the ground surveys of the north magnetic pole; and against 24 papers, reports and releases on the models, the anomaly and the pole. We checked the two readings of the note's charts in S0's special report of the same day against its transcript. Every other statement on this page was checked against its source, 225 references to 30 sources in all.

The verdicts and the items tagged "Our analysis" are our own assessment, built on the cited sources: the recomputation, the comparisons with other models and records, the test of IGRF-14's five-year steps, and our reading of what the note and the report do and don't show. The rules of our tests were fixed, and hashed, before any model was evaluated; the two of the note's conventions that we matched only after the first run, both consistent with its text, are labelled as such, as are the rates we added after it.

We recomputed all 82 of the numbers with numpy and scipy, and 59 of them again with a second script, in Python's standard library, that any reader can run (section 9). We couldn't compare the note's own data and scripts: its folder asked for a Google sign-in when checked at 18:10 UTC on November 9, and we don't sign in. Jackson and colleagues' paper, which describes gufm1, was read in full, from a copy the site's owner supplied. Eleven sources were read in abstract or significance statement only, one by title only, one in its Introduction only and two as records; Brown and colleagues' page showed a bot check, which we didn't attempt. We didn't see the report's graphics.

A fresh review of the built page, with its own field code, recomputed the note's numbers and ours and checked the quotations before publication. It found that gufm1's trend before 1840 lies inside the published range, not at its top, which made the first verdict True; that the 1600s, not the 1800s, were gufm1's slowest century for the pole; that our step statistic was a share of the squared change; and that our account of one paper made it look more doubtful of a coming reversal than it is. We corrected these and 30 smaller points; where we worded a correction differently from the review, our records say why.

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.
MISLEADING	Contains something true but leaves a false impression, usually by leaving out key context.
TRUE	The evidence supports the claim.

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 9, 2026	Published on factchecked.science after a full check against the sources: S0 News's research note 007, every one of whose numbers we compared reproduces from the public files of gufm1 and IGRF-14; COV-OBS.x2, CHAOS-8.7, NOAA's pole positions and the ground surveys; and the papers on the anomaly and the pole. The rules, scripts and derived numbers are hosted; none of the note's figures is redrawn, and none of its data is hosted. The first claim's verdict, True, rests on a modelled 1800 baseline, whose published range our check of Gubbins and colleagues' paper weighs.

Fact-Checked Science is independent. It isn't affiliated with the channels, presenters or authors whose claims it checks.

Last updated Nov 9, 2026