☑ **Fact-Checked Science**

EVIDENCE REVIEW · EXCURSIONS AND THE DEEP PAST

Magnetic excursions, floods and extinctions, on one timeline

Popular “catastrophe cycle” stories claim that Earth’s magnetic field weakens or flips on a regular cycle, and that each episode brings great floods, mass extinctions and the fall of early societies. Placed on one axis, these events spread across more than 100,000 years [2][10 p. 1] and have separate, well-studied causes. The clearest overlap, with the Laschamp excursion about 42,000 years ago, is better explained by drawn-out, regional processes involving people and climate [21][50][22].

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OUR ANALYSIS marks our own reasoning, and the verdicts are our assessment. Everything else comes from the numbered sources.

Many separate events, with separate causes

OUR ASSESSMENT

100,000+

years: the spread of the excursions on one axis, from Blake, 116,500–112,000 years ago, to Tianchi, about 7,000 years ago [2][10 p. 1]

1

overlap on our timeline between an excursion and extinctions, at Laschamp, about 42,000 years ago; drawn-out, regional processes involving people and climate explain those losses better [21][50][22]

32%

of the last 120,000 years lies within 1,000 years of one of the eight excursions, so some alignments are expected by chance OUR ANALYSIS

THE CATASTROPHE-CYCLE CLAIMS

FALSE

Magnetic excursions line up with great floods, mass extinctions and frozen mammoths, in a recurring cycle

Popular “catastrophe cycle” stories

Placed on one axis, the events spread across more than 100,000 years at irregular intervals. The Blake excursion passed with no documented mass extinction [46][2], an ice dam explains the Missoula floods [14][16], and on our chart no excursion falls near the last North American mammoths and mastodons, about 12,750 years ago [23]. The clearest alignment, around 42,000 years ago, involves Laschamp, and a second has been proposed at Mono Lake (section 2); with eight excursions on the chart, some chance alignments are expected. See section 1 and section 8.

OVERSTATED

The Laschamp excursion caused the extinctions of about 42,000 years ago

Proposed as a link by a 2021 paper in *Science* [45]

The idea has a basis: a near-coincidence in timing, a new tree-ring radiocarbon record and climate modeling [45]. But the losses were drawn out and regional, and the authors tie only their final phase to the excursion [48]. Neanderthal tool culture disappeared at different times in different regions and had ended across Europe by 41,030–39,260 years ago [22]. In Australia, the middle half of the estimated extinction dates spans roughly 48,000–37,000 years ago; a continent-wide analysis rejected climate change as the primary driver [21 pp. 1–2], and a regional study found people added to climate stress [50 p. 6]. Two formal comments rejected the causal story [46][47], and the authors call the events “only temporally associated” [48]. See section 2.

FALSE

The frozen mammoths were flash-frozen in a sudden catastrophe

Catastrophe stories about the frozen mammoths of Siberia

The two best-studied calves, Lyuba and Khroma, died separately, both after inhaling mud [28 Abstract], and by our calibration more than 2,000 years apart [32 p. 153][13]; their find sites lie about 2,600 km apart. Lyuba’s body changed after death: the scientists who studied her propose that lactic-acid bacteria helped keep it intact for an interval, “possibly years long,” before it was incorporated into permafrost [27 pp. 94, 104]. Khroma was frozen soon after death [28 Abstract]. Separate deaths, one followed by a slow freeze, don’t fit a single sudden catastrophe. See section 3.

FALSE

The great Ice Age floods were caused by a magnetic catastrophe

Catastrophe-cycle stories that pair each magnetic episode with great floods

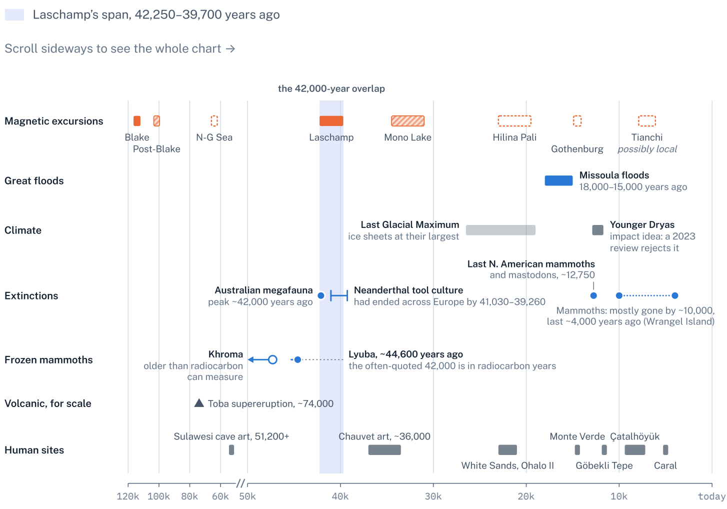
The Missoula floods came from an ice-dammed glacial lake that refilled every few decades until the water lifted the dam, producing dozens of floods between about 18,000 and 15,000 years ago [14][15][16]. No well-established excursion falls in that window. The nearest proposed ones, Hilina Pali (about 23,000–19,500 years ago) and Gothenburg (about 14,500), are disputed, and neither is needed to explain the floods [1 p. 376][10 p. 6][11]. See section 4.

1 · 120,000 YEARS AT A GLANCE

Over 120,000 years, the clearest overlap comes at Laschamp

Each excursion is drawn by the strength of its evidence. Of the excursions first reported in the 1960s and 1970s, a 2007 review in the *Treatise on Geophysics* says only Blake and Laschamp “have stood the test of time” [1 p. 376]; it counts Mono Lake among the five best documented, though its age is controversial [1 pp. 378, 385]. Below the excursions are the floods, extinctions and frozen mammoths that catastrophe-cycle stories tie to excursions, with climate, a volcanic eruption and early human sites for context.

120,000 years at a glance



Years ago (k = thousand). The scale is compressed before 50,000 years; section 6 enlarges the last 16,000.

Bar width shows the approximate age range; the shortest spans are drawn at a minimum width. N-G Sea is the Norwegian–Greenland Sea excursion. Blue marks the events that catastrophe stories tie to excursions; gray marks context. The three evidence classes are our reading of the sources, not a published classification, and the positions of Hilina Pali, Gothenburg, Khroma and Lyuba come from our IntCal20 calibration of their radiocarbon ages. All ages are approximate calendar years before present, counted back from 1950. Sources: excursions [1]–[12]; calibration [13]; floods [14]; climate [17]–[19]; extinctions [21]–[26]; frozen mammoths [27][28][31][32]; volcanic [33]; human sites [34]–[43].

Well established

Blake, two reversed intervals between 116,500 and 112,000 years ago in a dated stalagmite [2], and Laschamp, whose main phase came 41,100 ± 350 years ago, within a longest possible span of 42,250–39,700 [5]. Laschamp's "existence is proved beyond doubt" [1 p. 376].

Real but weaker

Post-Blake, reversed intervals 103,140–99,780 years ago in a Chinese stalagmite [3], and Mono Lake, a low about 34,500 years ago "mostly dominated by a nondipole field" [4 Abstract]. The 2007 review counts Mono Lake among the five best-documented excursions, though its age at the type locality "remains controversial" [1 pp. 378, 385].

Disputed or single record

The Norwegian–Greenland Sea excursion, a weak field about 64,500 years ago whose directions stayed "within the range of normal secular variations" [4 Abstract], which the 2007 review lists as poorly documented [1 p. 378, Table 2]; Hilina Pali, known mainly from Hawaiian lavas [6][8]; Gothenburg, a single "flip" in Swedish sediments that may be an artifact of sediment or sampling [11][1 p. 376][12]; and Tianchi, one lava dated 7,000 ± 900 years ago that may record a "maybe local" excursion [10 p. 6].

OUR ANALYSIS

Hilina Pali, about 23,000–19,500 years ago

A 2014 study dated a lava at Tianchi volcano, China, to 17,100 ± 900 years and linked it to Hilina Pali [9]. That lava has since been re-dated to 7,000 ± 900 years; it "does not record a ca. 17 ka Hilina Pali/Tianchi geomagnetic field excursion" [10 pp. 1, 6]. The excursion's own record is in Hawaiian lavas "at about 18,000 years B.P." in radiocarbon years [6 Abstract], and ash under a Kilauea flow is dated 17,360 ± 650 radiocarbon years [7 p. 94]. With IntCal20, assuming an error of ±500 years for the first, which has none stated, these give medians of 21,770 and 21,022 years ago, with 95% ranges of 22,921–20,586 and 22,512–19,420 [13], so we place Hilina Pali at about 23,000–19,500 years ago. The re-dating study cites an earlier calibrated date for the excursion, 19,300 ± 1,600 years [10 p. 5]; with IntCal20, the Hawaiian radiocarbon ages above come out older.

OUR ANALYSIS

Gothenburg, about 14,450 years ago

Mörner dated the Gothenburg "flip" to 12,400–12,350 years before present [11]. We read these as radiocarbon years, the standard in 1977. With IntCal20, and assuming a measurement error of ±100 years, 12,350 gives a median of 14,447 calendar years ago (95% range 14,909–14,077), and 12,400 gives 14,533 [13]. If they were varve years instead, the flip would be about 12,400 calendar years ago.

2 · THE OVERLAP 42,000 YEARS AGO

Drawn-out, regional processes explain the 42,000-year overlap better

Laschamp (main phase about 41,100 years ago) [5], the peak of Australian megafauna extinctions (about 42,100) [21 p. 2] and the end of Neanderthal tool culture across Europe (by 41,030–39,260) [22] all fall within about 3,000 years. Building on that coincidence, a new tree-ring radiocarbon record and climate modeling, a 2021 paper proposed that the weakened field, together with low solar activity, drove global climate shifts that caused extinctions [45]. The magnetic explanation remains a contested hypothesis [46][47].

Australia's megafauna

Continent-wide, extinctions peaked around 42,000 years ago, roughly 13,500 years after people arrived, though the middle half of the estimated extinction dates spans 48,100 to 36,700 years ago [21 p. 2]. A 2016 analysis found the extinctions independent of climate aridity and variability [21 p. 1]. A 2019 study of southeastern Australia found a combined effect: people arrived as "an additional stressor to climate perturbations," and where the megafauna vanished first depended on water sources that themselves depended on climate. Regional losses there spread from about 48,000 to 40,000 years ago [50 pp. 1, 2, 6].

The last Neanderthals

Their tool culture disappeared at different times in different regions and had ended across Europe by 41,030–39,260 years ago (95% range), after 2,600–5,400 years of overlap with modern humans [22].

The rebuttals

Two formal comments in *Science* disputed the 2021 paper. A comment by ten researchers, first-authored by the archaeologist Andrea Picin, said it "failed to provide convincing explanatory mechanisms" and that its timing coincidence was "highly questionable"; in their view, Greenland ice cores and marine records show no notable effect of the excursion on global climate [46]. The anthropologist John Hawks wrote that it misrepresented the extinction and archaeological evidence [47].

The control case

One of those comments pointed out that the Blake excursion, about 114,000 years ago, "occurred without apparent serious effects" on Neanderthals in Eurasia, *Homo sapiens* in Africa or the megafauna of Australia [46][2].

The authors' answers, and a second case

The authors replied that none of the cited studies undermined their model, while acknowledging that the events "remain only temporally associated" [48][49]. They said they had tied only the final phase of these longer processes to the excursion, and that recent studies found climate change around this time the likely driver of Australia's losses, with people "a key additional stressor"; their model ties such climate shifts to the weakened field [48][45]. The 2021 paper also links a second excursion, Mono Lake, about 34,000 years ago, to a cluster of megafaunal extinctions in Eurasia [45]; its authors note that Eurasian megafaunal extinctions "were broadly distributed through time" [48]. Section 8 estimates how often such alignments arise by chance.

OUR ANALYSIS

Lyuba is not part of the overlap

The mammoth calf Lyuba is often added to the list, but her usual age of 42,000 is in radiocarbon years: her two most reliable radiocarbon ages, on bone and gut contents, average about 41,800 [27 pp. 94, 97]. Calibrated with IntCal20, she died about 44,600 years ago (95% range 45,293–44,059), about 2,400 years before the earliest possible start of Laschamp [13][5].

3 · FROZEN MAMMOTHS

Preserved, not flash-frozen

The two best-studied calves died separately, in ordinary accidents, both after inhaling mud [27 p. 103][28 Abstract]. By our calibration and measurement, they died more than 2,000 years and about 2,600 km apart.

LYUBA, RADIOCARBON AGE

41,800

radiocarbon years, the average of her two most reliable ages, on bone and gut contents [27 pp. 94, 97]

LYUBA, CALENDAR AGE

OUR ANALYSIS

~44,600

years ago, from our IntCal20 calibration, with a 95% range of 45,293–44,059 [13]

LYUBA TO KHROMA

OUR ANALYSIS

~2,600 km

about 1,600 miles between the find sites: 2,507–2,743 km, depending on where along the Khroma River the calf was found [29][30][31]. A 2014 university release puts their populations "roughly 3,000 miles" apart, which doesn't fit the find sites [30].

Lyuba

Lyuba died about 44,600 years ago, when she was about a month old [27 p. 98][29][13]. CT scans and dissection found sediment blocking her trunk and fine mud filling her windpipe and bronchi: she inhaled mud and suffocated [27 pp. 94, 101, 103][28][30]. Her body changed after death. The scientists who studied her propose that lactic-acid bacteria colonized it and helped keep it intact for an interval, "possibly years long," while her burial site was gradually incorporated into permafrost [27 pp. 94, 104][28 Abstract].

Khroma

Khroma, found about 2,600 km (1,600 miles) to the east, is older than radiocarbon can measure: the team that studied her reports that she "exceeds the 45,000-year limit of this method" [32 p. 153]. By our IntCal20 calibration, that makes her older than about 47,300 years, more than 2,000 years before Lyuba [13]. She too had inhaled mud [28 Abstract], and mud was found in her mouth, nasal cavities, throat and windpipe [31 p. 2]. Unlike Lyuba, she was frozen soon after death [28 Abstract]. A possible scenario places her and her mother on a riverbank in spring; perhaps the bank collapsed and both plunged into the river [30].

In the researchers' words

> *"As an alternative to drowning, we propose that Lyuba died of asphyxia or suffocation after forceful, reflexive inhalation of a viscous 'mud' composed of the fine-grained vivianite that now occupies her trachea and bronchi."*
>
> Fisher et al. (2012) [27 p. 103]

> *"Both mammoths died after aspirating mud. Khroma's body was frozen soon after death, leaving her tissues in excellent condition, whereas Lyuba's body underwent postmortem changes ..."*
>
> Fisher et al. (2014) [28 Abstract]

When the mammoths died out

By about 10,000 years ago, mammoths survived mainly on islands. The last, on Wrangel Island, died out about 4,000 years ago [24][25][26]. On St. Paul Island, Alaska, they lasted until 5,600 ± 100 years ago [25].

4 · THE GREAT FLOODS

Ice dams, not magnetism

An ice dam on the Clark Fork River in northern Idaho held back glacial Lake Missoula, which rose about 2,000 feet (610 m) deep behind it [14][16]. It failed again and again, releasing dozens of floods, about 40 by one count of their layered deposits, between about 18,000 and 15,000 years ago [14][15].

STEP 1

Dam

Ice blocked the Clark Fork River in northern Idaho [14].

STEP 2

Fill

The lake rose behind the dam, refilling "every three to seven decades" [16 Abstract].

STEP 3

Float

At a depth of about 600 m, the water lifted the ice dam and drained beneath it [16].

STEP 4

Repeat

The conditions for a flood returned "scores of times during the 2,000-to 2,500-yr episode" of damming [16 Abstract].

No well-established excursion in the window

Floods like these came from lakes dammed by the shrinking ice sheets, more than 20,000 years after Laschamp [14][5]. Two proposed excursions lie near that window, and both are disputed. Hilina Pali, about 23,000–19,500 years ago, is known mainly from Hawaiian lavas [6][8][10 p. 6]. Gothenburg's single "flip" in Swedish sediments dates to about 14,500 years ago by our calibration [11][13] and may be an artifact of sediment or sampling [1 p. 376][12].

OUR ANALYSIS

Gothenburg and a jump in sea level

Gothenburg's calibrated range, 14,909–14,077 years ago [13], also overlaps meltwater pulse 1A, a rise in sea level of most probably 14–18 meters at Tahiti, 14,650–14,310 years ago [58]. That rise came from collapsing ice sheets as the climate warmed [58], so the overlap is a chance alignment of a disputed flip with an event that has its own explanation.

An ice dam that refills and breaks explains the floods without either excursion [16].

5 · CLOVIS AND THE IMPACT IDEA

No proposed excursion falls in the window when Clovis and the last mammoths vanished

Clovis tools were made for about 300 years, from about 13,050 to 12,750 years ago; their disappearance coincides with the last mammoths and mastodons, and people had lived in the Americas since at least 16,000–15,000 years ago [23].

North American megafauna

In the Yukon, ancient DNA in permafrost shows the mammoth steppe giving way between 13,500 and 10,000 years ago, with traces of mammoth and horse DNA lingering thousands of years after their last dated fossils. The authors caution that old DNA can be reworked into younger layers [51 pp. 1, 10]. Hunting, climate and an impact are all still argued as causes; no proposed magnetic excursion falls in this window [23][53].

The impact idea

A cosmic impact about 12,900 years ago was proposed to explain the Younger Dryas cold snap, the megafauna losses and the end of Clovis [52]. A 2023 review by 13 specialists concluded that it should be rejected: no crater of that age has been found, the proposed markers are not unique to impacts, and the landscape and plant records show no obvious cataclysm [53]. Proponents still dispute the review [54], and its authors have answered them [55].

A retraction in 2026

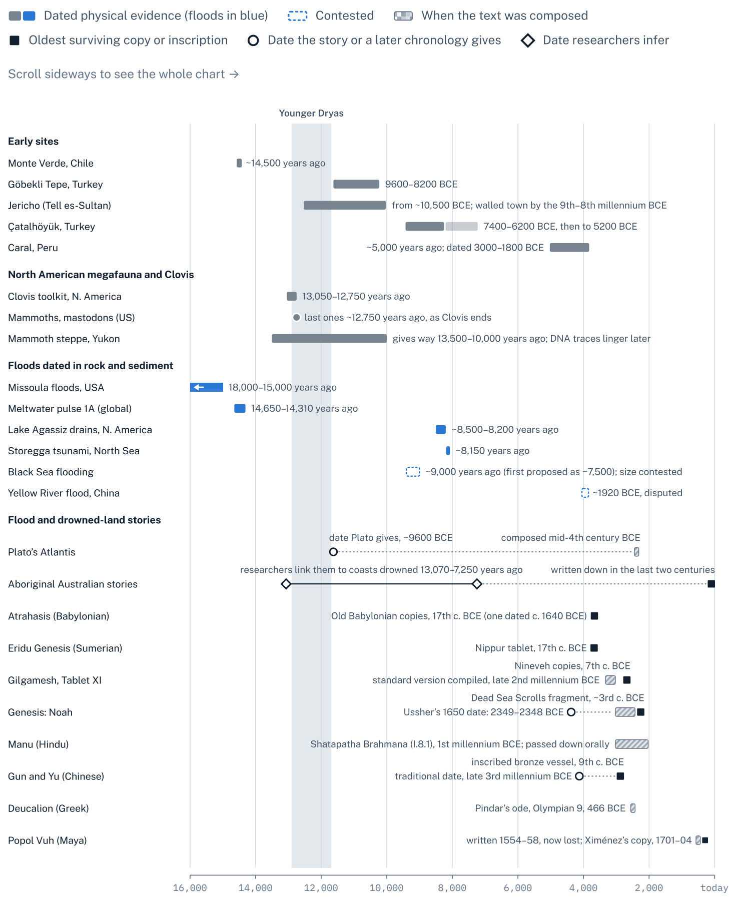
In February 2026, *PLOS One* retracted a 2025 report of shocked quartz at three archaeological sites in the US Southwest, including the Clovis type site, citing problems with its age model and sampling. Eight of its 18 authors did not agree with the retraction; the other ten did not respond or could not be reached [56][57].

6 · THE LAST 16,000 YEARS

Sites and floods are dated in rock and sediment; flood stories, by their texts

Sites, extinctions and floods are dated from physical evidence. For stories, the chart separates when a text was composed, the oldest surviving copy or inscription, and any date the story gives or that a later chronology worked out from it. The diamond marks the one date inferred by modern researchers, for the Aboriginal Australian stories [77].

The last 16,000 years: settlements, extinctions, dated floods and flood stories



Years ago. BCE dates are converted by adding about 2,000 years; dating labs count "before present" from 1950, a difference too small to see here.

Greek, Vedic and other texts copied by hand for centuries survive in much later manuscripts, so only their composition date is shown. The chart shows a selection of flood stories, chiefly the oldest written versions; collections list hundreds, one of them 262 [94]. Dates for texts are approximate, and many traditions are older than their earliest surviving copies. Sources: Younger Dryas [20]; sites [39][40][41]–[44]; megafauna and Clovis [23][51]; floods [14][58]–[74]; stories [75]–[93].

The Black Sea flood: earlier, and smaller

Ryan and colleagues proposed in 1997 that the rising Mediterranean spilled into a Black Sea lake lying more than 100 m lower, drowning over 100,000 km^2 of shelf about 7,500 years ago [63][64]. They later moved the event earlier [64], and a revised dating puts the reconnection about 9,000 years ago [65]. Evidence from the Danube delta suggests the lake stood only about 30 m below today, so any flood was much smaller than first proposed [66][67].

The Yellow River flood: disputed

A 2016 study reconstructed a landslide-dam outburst flood on the upper Yellow River about 1920 BCE and proposed it as the origin of the Great Flood legend [68]. Published comments question the lake's size, its dating, the flood's peak flow and its link to the Lajia ruins [69][70][71]. The authors replied [72], and a later study found no link between the Lajia disasters and the flood [73]. A historian of early China argues the Yu story began as a myth about making the world habitable and cannot be tied to any particular flood [74].

7 · FLOOD STORIES

Flood stories are widespread, but not universal

Many cultures tell of great floods. A century ago the anthropologist James Frazer gathered scores of them and found the type "widely diffused throughout the world," though such stories were absent from Africa and much of eastern and northern Asia, and rarer in Europe [95 pp. 332–333].

Why so many flood stories?

Since the last Ice Age, sea level rose about 120–130 meters (roughly 400 feet), drowning coastlines and land bridges [96][97]. Some Aboriginal Australian stories may preserve memories of that rise from more than 7,000 years ago [77].

Atlantis and the Flood

Plato's dialogues *Timaeus* and *Critias*, written in the mid-4th century BCE [76], place Atlantis's war with Athens about 9,000 years before the Athenian lawmaker Solon, roughly 9600 BCE, after which the island sank in "one grievous day and night" [75 Tim. 23e, 25d; Crit. 108e]. Plato is the only ancient source for it [98], and no archaeological trace has been found: archaeologists and classicists broadly agree it was Plato's own invention, a philosophical tale [99 p. 2]. Genesis dates the Flood only by Noah's age [100]. Archbishop Ussher's 1650 chronology put it in 2349–2348 BCE, usually quoted as 2348 BCE [85], over 7,000 years after Plato's date. Linking the two is a later idea, popularized by Ignatius Donnelly in 1882 [101].

Building through the change

Göbekli Tepe's monumental enclosures were begun about 11,600 years ago, just as the Younger Dryas ended [41][20]. Çatalhöyük's eastern mound holds 18 levels of Neolithic occupation, dated by UNESCO to 7400–6200 BCE, and settlement continued on the western mound to 5200 BCE [42]. Newer radiocarbon dating puts the eastern mound's start about 200 years later and its end just after 6000 BCE [102][103].

OUR ANALYSIS

People settle beside rivers and coasts, where floods recur. Shared themes don't require a single worldwide event. The record shows communities growing through these millennia, while floods and rising seas reshaped coasts region by region.

8 · WHY COINCIDENCES APPEAR ANYWAY

With eight excursions and wide error bars, some overlaps are expected by chance

The chart shows eight excursions proposed in the last 120,000 years, and others have been suggested [1 p. 376]. Ages near 40,000–50,000 years carry large uncertainties because radiocarbon dating reaches its limit around 50,000 years [22], and radiocarbon ages have to be calibrated before they can be compared with other dates [13].

CLOSE TO AN EXCURSION

OUR ANALYSIS

32%

of the last 120,000 years lies within 1,000 years of one of the eight excursions on the chart

AT LEAST ONE LINES UP

OUR ANALYSIS

85%

chance for five unrelated, randomly timed events, and 98% for ten

WELL-ESTABLISHED ONLY

OUR ANALYSIS

9.2%

of the span lies within 1,000 years of Blake or Laschamp

OUR ANALYSIS

How we counted

We widened each of the eight excursion bars on the chart by 1,000 years on each side, merged any that overlapped, and measured how much of the last 120,000 years they cover: 38,000 years, or 32%. An event placed at random has a 32% chance of landing that close to an excursion, so for five unrelated events the chance that at least one does is $1 - 0.683^5$, about 85%. With a 500-year margin the share is 25%; with 2,000 years, 45%. Most of it comes from the six weaker or disputed excursions: counting only Blake and Laschamp, the share is 9.2%.

OUR ASSESSMENT

Many separate events, with separate causes

Excursions come from the core [1], the floods from ice-dammed lakes [14][16], the extinctions from drawn-out, regional processes involving people and climate, though the balance is still debated [21][50][22][23], and the frozen mammoths from individual accidents preserved in permafrost [27][28]. The record shows no common magnetic trigger.

What would change these verdicts

01

Excursions shown to recur at regular intervals, each matched within its dating uncertainty by floods, extinctions and frozen-mammoth deaths.

02

Evidence that Laschamp itself drove the extinctions of about 42,000 years ago: a climate effect of the excursion seen in ice cores and marine records, and losses that track it in the fossil record, not only a near-coincidence in timing.

03

Frozen mammoths that died together in one sudden freeze, or great floods with no ice-dammed lake to explain them.

Dates near the limit of radiocarbon dating could still shift. Gothenburg's date assumes that Mörner's ages are radiocarbon years, as was standard in 1977; if they were varve years, the flip would be about 12,400 calendar years ago [11].

Related checks

- FALSE Every 6,000 years? The Disaster Cycle, Fact-Checked
- FALSE A "clean sweep" of scientists? The Disaster Cycle, Fact-Checked
- FALSE Ringless trees and frozen mammoths The Disaster Cycle, Fact-Checked

Sources

Bracketed numbers refer to this list; p. and pp. give pages (the journal's own page numbers), and Abstract, Introduction, Fig. and Table name the part of a work we used. Tim. and Crit. are the Stephanus sections of Plato's Timaeus and Critias. Links checked October 12, 2026.

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METHOD

How this was checked

On October 12, 2026, we checked every statement, number, quotation and citation on this page against its source, about 150 items in all: every bar and label on the infographic's two charts, every sentence of its cards, and its 23 references, which became the sources listed here. We resolved every DOI and read the open papers in full and the others at abstract level; where it matters, the locator says which part we used. A few items rest on less direct evidence: Khroma's radiocarbon result comes from a short report by the team that studied her, which we read in an online copy `[32 p. 153]`, and the link between a dated Hawaiian ash and the Hilina Pali lavas is inferred from where the sample was taken `[7 p. 94]`.

The check moved several marks. Hilina Pali is now about 23,000–19,500 years ago, not 20,000–17,000, an age that fits a Chinese lava since re-dated to about 7,000 years `[10 p. 6]` and an earlier calibrated date for the excursion `[10 p. 5]`. On the 16,000-year chart, the Black Sea flood moved from about 7,600 to about 9,000 years ago `[65]`, Jericho now starts about 10,500 BCE `[44]`, and the oldest Dead Sea Scrolls copy of the Flood story moved to about the 3rd century BCE `[86]`. A second reviewer, who had not seen the drafting, then read the built page against its sources, re-ran the calibrations and the chance-overlap count, and compared every DOI with Crossref. That check corrected how we described the end of Neanderthal tool culture `[22]` and a 2019 study of Australia's megafauna `[50 p. 6]`, sourced Khroma's age to the team that studied her, added the 2021 paper's Mono Lake claim and its authors' answers to their critics `[48]`, moved the Norwegian–Greenland Sea excursion to the disputed class `[1 p. 378, Table 2]`, and drew the Blake, Post-Blake and Laschamp bars at their cited ages, which moved the chance numbers in section 8 by a point or two. The change log lists the main changes.

The verdicts and the items tagged "Our analysis" are our own work, built on the cited sources: the IntCal20 calibrations for Lyuba, Gothenburg, Hilina Pali and Khroma `[13]`, the distance between the two mammoth calves' find sites, and the chance-overlap count in section 8. Our calibrations reproduce the infographic's ages for Lyuba (about 44,600 years ago) and Gothenburg (about 14,450); Hilina Pali's changed. The three evidence classes for excursions are our reading of the sources, not a published classification. We also measured both of the infographic's charts against the code that drew them: every mark sat within a pixel or two of the date its label gave, though three excursion bars used rounded ages rather than those of their sources; they are now drawn at the cited ages.

This page was researched and written with Claude, an AI assistant made by Anthropic, and then re-checked against its sources in two separate verification passes, the second after the page was built.

The verdicts on this page

FALSE	The evidence contradicts the claim.
OVERSTATED	Has some basis but claims much more than the evidence supports.

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

`Oct 12, 2026`	Published on factchecked.science after a full check against the sources and a second, independent check of the built page. Changes from the infographic: the Blake, Post-Blake and Laschamp bars now sit at their cited ages, 116,500–112,000, 103,140–99,780 and 42,250–39,700 years ago (they were drawn at 116,000–112,000, 102,000–98,000 and 42,000–40,500), and the shaded band now spans Laschamp; Hilina Pali moved to about 23,000–19,500 years ago (it was drawn at 20,000–17,000, an age that fits a Chinese lava since re-dated to about 7,000 years and an earlier calibrated date of 19,300 ± 1,600 years); the Norwegian–Greenland Sea excursion is now classed as disputed, as a 2007 review lists it as poorly documented; the end of Neanderthal tool culture is now the range by which it had ended across Europe, 41,030–39,260 years

ago, not a span of regional endings; Khroma's age beyond the reach of radiocarbon is now sourced to the team that studied her; Lyuba's radiocarbon age is the average of her two most reliable dates, and her preservation by lactic-acid bacteria ("pickled" on the infographic) is the excavators' proposal, over an interval possibly years long; the coldest phase of the last Ice Age is now labeled the Last Glacial Maximum; at Lake Missoula, 2,000 feet is the depth of the water behind the ice dam, not the dam's height, and the floods are counted as dozens, about 40 by one count; a 2019 study now reads as finding people an added stressor to climate in southeastern Australia, not the other way around; the "one real overlap" is now the clearest overlap, with Laschamp, and the 2021 paper's second proposed case, Mono Lake, is now included; that paper's evidence is described, both formal comments on it are named, and the authors' replies and answers are given; the retracted 2025 shocked-quartz paper covered three archaeological sites, not all of them Clovis sites, and 8 of its 18 authors disagreed with the retraction. On the 16,000-year chart: the Black Sea flood moved from about 7,600 to about 9,000 years ago and is described as smaller than first proposed; Jericho starts about 10,500 BCE; the oldest Dead Sea Scrolls copy of the Flood story is from about the 3rd century BCE; the dates for Atrahasis, the Sumerian flood tablet, Plato, the Gun and Yu bronze, the Gun and Yu tradition, Ussher's Flood and the Aboriginal stories were refined, and Caral is drawn across its radiocarbon dates; Frazer's survey now notes where he found no flood stories; the sea-level rise is 120–130 meters; the chart shows a selection of flood stories, not a representative set. Added a count of how often chance alignments with the plotted excursions are expected. Every excursion now cites its primary dating study, and the climate, extinction and Toba dates have sources. Restated the verdicts on our standard scale: the infographic rated no single claim, and its closing box said the record shows no common magnetic trigger.

Oct 6, 2026	The infographic was revised: ages in calendar years, with Lyuba's often-quoted 42,000 identified as radiocarbon years; the Gothenburg excursion placed by calibration; North American megafauna and Clovis added; references expanded from 16 to 23.
Sep 29, 2026	An earlier version of the infographic, with 16 references.
