PAPER CHECK · EARTHQUAKES

When Cascadia breaks, does the San Andreas follow?

A study of seafloor sediment, focused on the past 3,100 years, argues that the Cascadia subduction zone and the northern San Andreas fault are partly synchronized, sometimes rupturing close together in time [1 p. 1132]. Layers on both sides of their junction do match in time, within dating error. That they record pairs of earthquakes is the authors' interpretation, and the headline claim, minutes to hours apart, rests on a few layers.

By Fact-Checked Science · Published October 13, 2026

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

Dates that agree, an unproven link

OUR ASSESSMENT

10 of 18
Cascadia layers from the past 3,100 years with a close match in time on the San Andreas side [1 p. 1132].

63 yr
The average difference between the paired layers' median radiocarbon ages: agreement within dating error, not a gap between quakes [1 p. 1132].

Unknown
The time between the two ruptures for most pairs, in the paper's own words: "not known" [1 p. 1174].

THE CLAIMS ABOUT THE TWO FAULTS

TRUE

Layers on both sides of the junction match in time, within dating error

The paper's abstract [1 p. 1132]

Ten of 18 Cascadia layers from the past 3,100 years have counterparts in Noyo Channel, on the San Andreas side, within radiocarbon error; the paper's conclusions say nine. Such tests can show only that the dates are consistent, not that the layers formed together, as the supplement notes [2 Text S1]. See section 1.

UNCONFIRMED

The two faults are partly synchronized

The paper's title and abstract [1 p. 1132]

One team's reading of unusual double layers and recurrence rates, which it says "may represent direct evidence." The outside experts National Geographic asked agreed that more research is needed [3]. See section 4.

OVERSTATED

Three times, they broke minutes to hours apart

Oregon State University's release, as what the researchers believe [4]

It rests on a few Cascadia-side layers where a second flow settled into the first. The paper's conclusions say these "would imply minutes to hours of separation," but its discussion allows "at most a few years," and for the pairs in general it says the separation is "not known" [1 p. 1171][1 p. 1174]. See section 1.

OVERSTATED

"New research suggests the Cascadia subduction zone and the San Andreas fault can 'sync up,' triggering earthquakes within minutes or hours of each other."

ScienceDaily, May 2, 2026 [5]

The paper argues for partial synchronization, about six likely pairs in 2,500 years, and the San Andreas broke in 1906 without Cascadia [1 p. 1167][1 p. 1165]. It puts minutes to hours on only a few Cascadia-side layers; for the pairs in general it says the separation is "not known" [1 p. 1174]. See section 4.

1 · HOW FAR APART?

It depends on which reading you take

The paper says that, for most pairs, "the time separation between the Cascadia subduction zone and northern San Andreas fault ruptures is not known" [1 p. 1174]. The readings in the paper, the release and the press run from minutes to decades.

Bands show the range each source states, drawn schematically. Live Science's reading was relayed by Hoodline in May 2026 [8].

Radiocarbon can't measure the gap

The paired layers' median radiocarbon ages differ by 63 years on average, with a standard deviation of 51, and the authors say they "all exceed statistical tests of coevality" [1 p. 1132][1 p. 1174]. That measures how well the dates agree, not the time between two quakes: the ages come from mud beneath each layer, so, in the authors' model in which Cascadia breaks first, both sides date the first event [1 p. 1136][1 p. 1172].

OUR ANALYSIS From the Trinidad and Noyo Channel model ages in the paper's Table 1, we get an average of 51 years for the ten pairs (standard deviation 37). The paper doesn't say which ages give 63 [1 p. 1160].

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The firm result is that the layers' dates on both sides of the junction agree within radiocarbon error.

That they record pairs of earthquakes, one on each fault, is the authors' interpretation. How close together the quakes came is a further step, and the readings range from minutes to decades.

2 · WHERE THE TWO FAULTS MEET

Cores from both sides of the Mendocino triple junction

The Cascadia subduction zone and the northern San Andreas fault meet at the Mendocino triple junction off northern California [1 p. 1133]. The team compared likely earthquake-triggered layers of sediment in seafloor cores on both sides.

- Cascadia subduction zone, about 1,000 km long [1 p. 1133]
- Northern San Andreas, the stretch that broke in 1906 [9]
- Mendocino fracture zone
- Sediment core sites, examples [2]

Schematic: coastline and fault traces generalized by us; core sites from the paper's supplementary data.

3,100 years
the span of the main comparison, in cores from both sides of the triple junction that reach back through the Holocene [1 p. 1132][1 p. 1171]

10 of 18
Cascadia layers closely matched in time to likely earthquake layers in Noyo Channel, on the San Andreas side; the paper's conclusions say nine [1 p. 1132][1 p. 1174]

63 years
average difference between the paired layers' median radiocarbon ages, with a standard deviation of 51 years: agreement within dating error [1 p. 1132]

3 pairs
in the past 1,500 years, including 1700, that Goldfinger reads as minutes to hours apart [4]; the paper names four candidate layers, the fourth, T5, dated to about 1,480 years before 1950, at the edge of that span [1 p. 1171][1 p. 1160]

1698–1700
one of the two strongest tree-ring disturbances in coast redwoods at Fort Ross and Gualala in the time range of the last San Andreas rupture before 1906 (8 of 16 trees, peaking in 1698; the other, 1678–1680, in 6 of 15); their cause is unknown [10 Abstract]. The authors call the date "a potential match for the penultimate event described in this work," the San Andreas rupture they pair with the Cascadia earthquake of January 1700, while noting that "dendrochronology has significant subjectivity" [1 p. 1167][11].

3 · READING AN UPSIDE-DOWN LAYER

Coarse on top of fine: the double layers behind the claim

A normal turbidite

An underwater avalanche drops coarse sand first and fine silt last, so the layer fines upward: one flow, one event. A single earthquake can also leave a bed of several pulses, which the authors distinguish from the double layers [1 p. 1137][1 p. 1163].

An inverted doublet

1 A fine, silty unit from a distant quake. 2 A coarse, sandy unit on top from a nearby one, commonly across an eroded contact [1 p. 1132]. South of Cape Mendocino the authors read this as Cascadia first, San Andreas second [1 p. 1172].

Two separate flows

Background mud settling between layers records elapsed time. No mud inside a doublet points to a short gap, unless the second flow scoured it away, as the authors themselves note [1 p. 1170][1 p. 1171].

Coarse sand · Silt · Fine silt · Background mud · Eroded contact · Schematic cores, not to scale

4 · THE CASE FOR A LINK, AND AGAINST

Plausible, partial, and still contested

Why a link is plausible

Doublets go with the matches. Eight of the 10 Noyo layers that line up in time with major Cascadia events are thick, inverted double layers; layers without such a match, including 1906's, are not [1 p. 1132].

1906 left layers on both sides. The San Francisco earthquake set off underwater avalanches on both sides of the junction, so the San Andreas can shake slopes on the Cascadia side; a layer from 1992 may show the reverse [1 p. 1132].

The rates don't add up. Big layers near the junction recur at about the rate of either fault alone, roughly every 210–230 years, not both combined, as if each pair holds one event from each fault [1 p. 1132][1 p. 1171].

1700 shows up on land. Onshore sites date the last San Andreas rupture before 1906 close to 1700: Vedanta Marsh to about 1710 CE and Lake Merced to about 1730 (1580–1890) CE, and redwood tree rings show a disturbance in 1698–1700 [1 p. 1157][10 Abstract].

Fast doublets happen. Stress transfer between faults is "a well-established principle" [1 p. 1132], and Turkey's 2023 earthquakes struck 9 hours apart [7]. In Sumatra, the only modern forecast of one great earthquake triggering another came true, and seafloor layers there record the 2004 and 2005 earthquakes three months apart [1 p. 1132][1 p. 1172].

Why to hold back

Dating can't resolve less than decades. The paired layers' median ages differ by decades, and each age's range in Table 1 spans at least 200 years [1 p. 1160]. Only the layering speaks to minutes or hours, in a few Cascadia-side beds [1 p. 1174].

The authors' own caveats. They say the missing mud in the Noyo doublets can't be used to time them, because the upper flow often eroded the lower one, and they rest the short-gap reading on Cascadia-side beds, where they still allow "at most a few years" [1 p. 1170][1 p. 1171]. Cascadia quakes recorded at Noyo Channel too "might explain much of the temporal correspondence"; it is the double layers that lead them to a second, San Andreas, event [1 p. 1165].

Matching distant cores is contested. Correlating turbidites between distant cores has been challenged before: a 2014 critique said Cascadia magnitude estimates "hinge on stratigraphic correlations that discount variability in turbidite facies" [12 Abstract]. Geophysicist Diego Melgar agrees most Cascadia turbidites could be from earthquakes, but isn't convinced the far-flung pairs are linked: "What they're presenting as synchronicity is in no way a slam dunk." He also doubts the match in timing itself: "Can you really say these happened at the same time? Most of us would say no" [3].

"Partial," and uneven. The title says partial synchronization, and the doublets fade northward along Cascadia and southward along the San Andreas [1 p. 1132]. The 1906 rupture came without a Cascadia event [1 p. 1165].

5 · READ WITH CARE

What the coverage adds, and what it doesn't

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Old news, recirculated

The paper came out on September 29, 2025 [1 p. 1132]. ScienceDaily ran versions of the story in October 2025, May 2026 and September 2026, plus a page now dated July 2026 [5].

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Alternatives were weighed

The authors judge aftershock sequences and purely hydrodynamic causes less likely explanations for the doublets [1 p. 1132][1 p. 1164]. We found no independent test of that, though we couldn't check every paper citing the study.

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Quotes are not findings

Goldfinger's remark that he would drive east from Palo Alto if Cascadia went off, in the Geological Society of America's release, is personal judgment, not a result of the study [13].

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Still worth planning for

Two near-simultaneous great earthquakes would stretch the national response, Goldfinger says [4]. The study counts about six likely pairs in 2,500 years, but it gives no forecast, and the gap is unknown for most pairs [1 p. 1167][1 p. 1174].

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Bottom line: a careful study whose layer dates agree within radiocarbon error, and an intriguing interpretation.

Read "minutes to hours" as the authors' reading of a few layers, and "partly synchronized" as a hypothesis that outside experts say still needs testing.

Limits of this check

The published paper, from a repository

The publisher's site refused our requests, so we read the published PDF in an institutional repository; the press coverage we read directly, except Hoodline, which we saw only in fragments.

Abstracts for two sources

For the redwood tree-ring study and the 2014 critique of turbidite correlation, we read only the abstracts.

An unreproduced statistic

The paper doesn't say which ages give its 63-year average; the model ages in its Table 1 give about 51 years.

Sources

Bracketed numbers refer to this list; p. gives a page of the source (for the paper [1], the journal's page numbers), Text S1 is the supplement's text, and Abstract names the part of a work we used. Links checked October 13, 2026.

1 Goldfinger, C., Beeson, J., Black, B., Vizcaino, A., Nelson, C. H., Morey, A., Patton, J. R., Gutiérrez-Pastor, J., Romsos, C., and Walzcak, M. D. (2025). Unravelling the dance of earthquakes: Evidence of partial synchronization of the northern San Andreas fault and Cascadia megathrust. *Geosphere* 21(6), 1132–1180. Published online September 29, 2025. Open access, CC BY-NC 4.0.

2 Goldfinger, C., et al. (2025). Supplemental Material: Unravelling the dance of earthquakes: Evidence of partial synchronization of the northern San Andreas fault and Cascadia megathrust. GSA Data Repository, figshare. Supplemental Text S1 describes the age comparisons; Supplemental Data S1 lists the core locations. CC BY-NC 4.0.

3 Dzombak, R. (2025). How 'the big one' near Seattle could trigger an earthquake in San Francisco. *National Geographic*, October 23, 2025.

4 Nealon, S. (2025). Twin threat: Cascadia and San Andreas faults may be seismically linked. Oregon State University Newsroom, October 6, 2025.

5 ScienceDaily versions of the story: October 23, 2025 (source: GSA); May 2, 2026 (source: Oregon State University); dated July 18, 2026 (GSA); and September 23, 2026 (Oregon State University). Accessed October 13, 2026.

6 Pappas, S. (2025). Link between Cascadia and San Andreas Fault earthquakes discovered 30 years after lost vessel stumbled across key data. *Live Science*, October 13, 2025.

7 U.S. Geological Survey. Earthquake events us6000jllz (M 7.8, 01:17 UTC) and us6000jlqa (M 7.5, 10:24 UTC), Türkiye, February 6, 2023. Accessed October 13, 2026.

8 Tanaka, E. (2026). Cascadia Jolt Could Jack Up San Andreas In Double Quake Threat From San Francisco To Seattle. *Hoodline*, May 7, 2026.

9 U.S. Geological Survey. The Great 1906 San Francisco Earthquake. Accessed October 13, 2026.

10 Carroll, A. L., Philibosian, B., Sillett, S. C., Antoine, M. E., and Kozacı, Ö. (2025). Dendroseismological investigation of redwood trees along the North Coast section of the San Andreas Fault. *Quaternary Science Advances* 18, 100283. CC BY-NC 4.0.

11 Satake, K., Shimazaki, K., Tsuji, Y., and Ueda, K. (1996). Time and size of a giant earthquake in Cascadia inferred from Japanese tsunami records of January 1700. *Nature* 379, 246–249.

12 Atwater, B. F., Carson, B., Griggs, G. B., Johnson, H. P., and Salmi, M. S. (2014). Rethinking turbidite paleoseismology along the Cascadia subduction zone. *Geology* 42(9), 827–830.

13 Molinek, R. (2025). New in 'Geosphere': Could a Cascadia Megathrust Earthquake Trigger the San Andreas Fault? Geological Society of America press release, October 3, 2025.

METHOD

How this was checked

On October 13, 2026, we checked every statement, number and source on the original infographic, 47 items, against the published paper, its supplementary data, Oregon State University's and the Geological Society of America's releases, the press articles it cites and USGS records. We tried to reproduce the paper's 63-year average from its Table 1 (we get 51 years), located the tree-ring and lake records it relies on, and measured the original chart against its axis. The check corrected several statements; the change log lists them.

After the page was built, a second reviewer who hadn't seen the drafting checked it against the paper, its supplement and the press pieces, and re-derived every chart mark and map position; all reproduced. The changes that followed: the ScienceDaily claim is now quoted in full, with its opening "New research suggests"; the verdict on "minutes to hours" now says that the paper's conclusions do read a few layers that way; the match in timing is described as dates that agree within radiocarbon error, and the outside expert's doubt about the timing itself is added; the tree-ring date is now matched, as the authors match it, to the last San Andreas rupture before 1906; the authors' evidence that the double layers go with the matches is added; and a dozen smaller fixes.

The verdicts and the items tagged "Our analysis" are our own assessment, built on the cited sources. The paper is open access under CC BY-NC 4.0 [1]; we don't reproduce its figures, and the map and cores here are our own schematics.

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

- OVERSTATED — Has some basis but claims much more than the evidence supports.
- UNCONFIRMED — Rests on a preliminary result that hasn't been confirmed.
- 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

Oct 13, 2026 Published on factchecked.science after a full check against the sources. Changes from the infographic: added our verdicts on four claims, and quoted the ScienceDaily claim in full, with its hedge. The 1698–1700 tree-ring date comes from redwoods at Fort Ross and Gualala, not Lake Merced; it is one of two strong disturbances there, its cause is unknown, and the authors match it to the last San Andreas rupture before 1906, which they pair with the Cascadia earthquake of 1700. Lake Merced is a lake-sediment record dated to about 1730 (1580–1890) CE. The chart no longer plots 63 ± 51 years as time between the two earthquakes: it measures how well the paired layers' dates agree, and both dates come from below each layer; we add that the model ages in the paper's Table 1 give about 51 years. The dek and takeaway no longer call the pairing "well supported" or say the two faults' earthquakes "cluster in time": the dates agree within radiocarbon error, the two-fault reading is the authors' interpretation. "Erosion can hide a gap" now credits the authors, who make that point themselves and base the short gap on Cascadia-side layers, with their discussion's range of hours to a few years. Live Science's article dates from October 13, 2025, not May 2026 (Hoodline relayed it then), and its band now runs to two days; the paper's own two readings were added to the chart. "10 pairs" notes that the conclusions say nine, "3 pairs" that the paper names four candidate layers, and the doublets fade southward along the San Andreas as well as northward along Cascadia. "The study does not say how often it happens" now notes that it counts about six likely pairs in 2,500 years but gives no forecast. The 1906 item no longer says each fault can shake the other's slopes; the reverse rests on a possible 1992 layer. "Likely San Andreas earthquake layers" is now "likely earthquake layers in Noyo Channel." Melgar is described, as National Geographic does, as a geophysicist who agrees most Cascadia turbidites "could be" from earthquakes, and his doubt about the timing itself is added. "Independent groups have yet to test that" now says only that we found no such test. ScienceDaily ran four versions, not two. The Palo Alto remark is credited to the Geological Society of America's release. Added the paper's statement that the time separation is not known, its note that Cascadia quakes alone might explain much of the match, the evidence that the double layers go with the matches, the outside experts' view, and the limits of this check.