



EARTHQUAKE

e-Newsletter about what's movin' and shakin' at the Earth Science Museum

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A Tale of Two Faults

By Harvey Jong

There is the “big one”, a massive earthquake (estimated magnitude: 7.8-8.2) involving California’s San Andreas Fault, and then there is the “really big one”, a gigantic megathrust earthquake (estimated magnitude: 9) occurring along the Cascadia Subduction Zone (CSZ). A recent news story reported that the two major fault systems may be connected where seismic activity from one fault may trigger a quake on the other (Geological Society of America, 2026). This month we will explore what’s behind the suggested seismic synchronization that may potentially bring about the “worst of times”.

The phrase “really big one” comes from the title of the 2015 Pulitzer Prize-winning article by Kathryn Schulz. This *New Yorker* magazine article highlighted the risk and widespread destruction associated with what could possibly be North America’s worst natural disaster in recorded history. The investigative story described the scientific detective work involved in reconstructing the great earthquake and tsunami of 1700. The megathrust quake, which was one of the largest known earthquakes, entailed a rupture of the full length of the CSZ fault. The magnitude has been estimated to be around 9. By comparison, California’s “big one” has a hypothetical upper magnitude limit of roughly 8.2, only six percent as strong (Schulz, 2015). (Note that the Richter scale is logarithmic where increasing the magnitude by one corresponds to a ten times

higher amplitude. The energy released by an earthquake is defined as $(10^{\text{magnitude}})^{3/2}$, so a difference in magnitude by one represents a factor of 31.6.)



Location of the Cascadia Subduction Zone

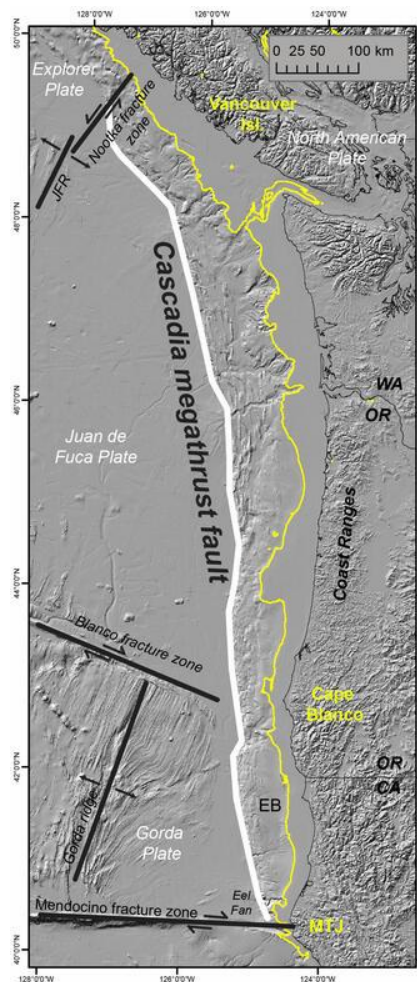
Alicia.iversen map, - CC_BY-SA-4.0 International, via Wikimedia Commons

Tectonic Setting

Cascadia Subduction Zone

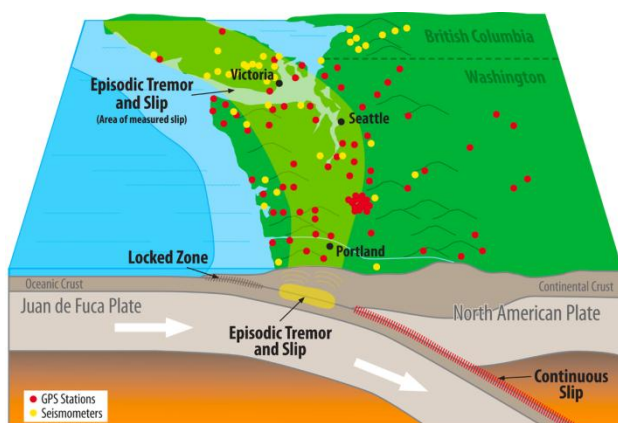
The CSZ is a 1,100-km (684-mile) convergent plate boundary that extends from Canada’s Vancouver Island to Cape Mendocino in northern California. The long, sloping subduction zone involves the Explorer, Juan de Fuca, and Gorda Plates moving east and

sliding below the larger North American Plate.



Topo-bathymetric Map of the Cascadia Subduction Zone

USGS map, - PD, via USGS.gov
The Explorer, Juan de Fuca, and Gorda Plates are small remnants of the large ancient Farallon Plate. These plates are sliding below the North American Plate forming a subduction zone.



Cascadia Subduction Zone Cross Section

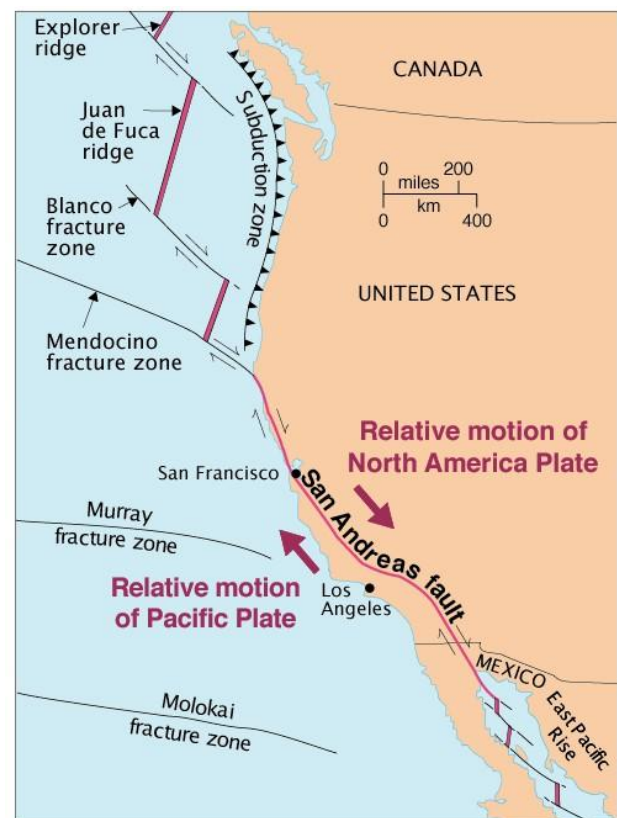
IRIS.edu image, - PD, via pnsn.org

This diagram shows the Juan de Fuca Plate subducting beneath the North American Plate.

The plate is advancing at a rate of about 35-38 mm (1.4-1.5 in) per year (Goldfinger et al., 2012). The locked zone indicates where stress is building from the intense friction associated with the contacting plates. The North American plate is pushed backward creating strain. A megathrust earthquake occurs when friction can no longer keep the plates locked in place, and the upper plate rebounds to its original position.

San Andreas Fault

South of the CSZ is the San Andreas Fault which is a transform fault that extends about 1,210 km (750 miles) through California. The fault involves movement between the Pacific Plate which is traveling northwestward and the North American Plate which is moving southeastward.



Tectonic Setting of the San Andreas Fault

USGS map, - PD, via usgs.gov

This map shows the location of the San Andreas Fault relative to the CSZ. It also indicates the relative motions of the Pacific and North American Plates. The plates are moving at an average rate of about 30-50 mm (1.18-1.97 inches) per year.



Aerial View of the San Andreas Fault

Robert E. Wallace photo, - PD, via usgs.gov

This dramatic aerial view shows the San Andreas Fault slicing through the Carrizo Plain in the Temblor Range east of San Luis Obispo. Note that the fault is comprised of three segments that can move independently, so a full rupture is not possible.

Mendocino Triple Junction (MTJ)

Situated between the two fault systems is the Mendocino Triple Junction, a boundary where the Pacific, North American, and Juan De Fuca Plates converge. The location represents a major transition in plate

motions with the convergence of the CSZ and the translation of the San Andreas Fault. Due to the relative plate motion, the triple junction has been migrating northward, and a gap, called a slab window, has developed at the southern edge of the Gorda Plate. This slab window occurs beneath a thinned region of the lithosphere which leads to upwelling of material from the asthenosphere.



Map of the Mendocino Triple Junction

USGS map, - PD, via usgs.gov

Seismic Activity

Seismic activity varies with the two fault systems, and some notable earthquakes include:

Fault/Region	Description
CSZ	Date: Jan. 26, 1700 Magnitude: 8.7-9.2 Rupture length/depth: full length ~1,000 km (621 mi)/unknown Widespread tsunami that inundated Pacific coast including Japan
MTJ	Date: Dec. 5, 2024 Epicenter: offshore, Cape Mendocino (40.374°N

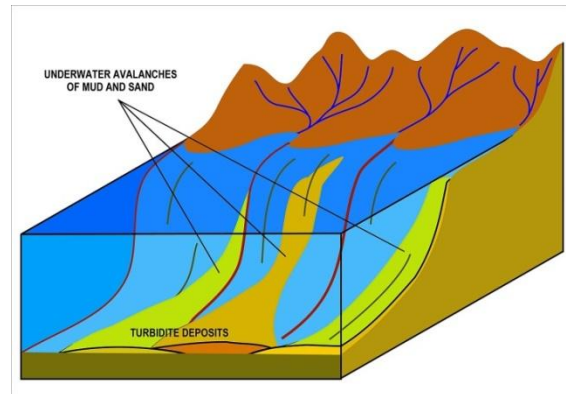
	125.022°W) Magnitude: 7.0 Rupture length/depth: ~70 km (43.5 mi)/20-30 km (12.4-18.6- mi) Small tsunami, 9 cm (3.5 in) wave height
San Andreas	Date: Apr. 18, 1906 Epicenter: offshore, 2 miles west of San Francisco Magnitude: 7.9 Rupture length/depth: northern segment 477 km (296 mi)/9 km (5 mi) Date: Jan. 9, 1857 Epicenter: near Parkfield, California (35.72°N 120.32°W), but referred to as Fort Tejon earthquake where greatest damage occurred Magnitude: 7.9 Rupture length/depth: southern- central segment 362 km (225 mi)/< 10 km (6.2 mi)

The CSZ is characterized by an extremely low earthquake rate compared to other subduction zones. No significant megathrust earthquakes have occurred since January 26, 1700. The inability to collect data from direct seismic measurements makes assessing the earthquake risks difficult.

Stress is assumed to be accumulating between the friction-locked plates, but it is uncertain when this pressure may be released producing the next great earthquake and tsunami. Subsequently, scientists have been analyzing varied geologic evidence and making inferences about potential fault behavior, such as rupture extent and recurrence intervals. One key piece of information involves sediment layers known as turbidites.

Turbidites

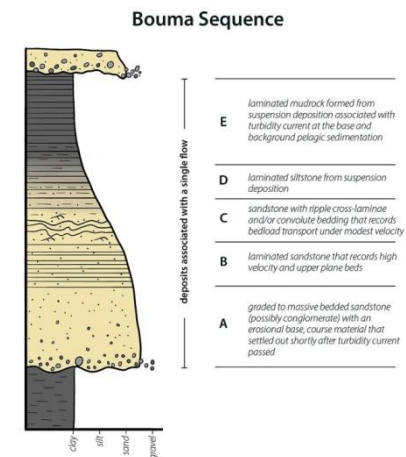
Turbidites are sediment layers deposited by a turbidity current, a rapid downhill flow of water. Sediments are suspended by the water turbulence and settle out as the current reaches calmer water.



Formation of Turbidite Deposits

Oggmus illustration, - CC_BY-SA-4.0 International, via Wikimedia Commons

Driven by gravity, the sediments are deposited in a graded sequence that typically consists of coarse material at the bottom and fine matter on top. An idealized model of this sequence is called the Bouma sequence which has five distinct layers:



Stratigraphic Column of the Bouma Sequence

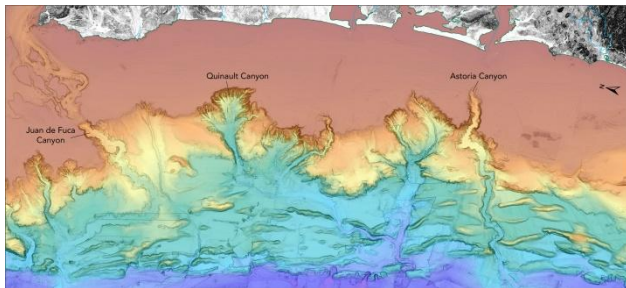
Page Quinton illustration, - CC_BY-SA-4.0 International, via Wikimedia Commons

Turbidity currents can be triggered by earthquakes, so the resulting turbidite deposits can serve as a proxy to reconstruct a seismic event. These currents, however,

may also be produced by other mechanisms, such as floods, storms, submarine-volcanic eruptions, ocean currents, or internal tides. A paleoseismologist faces the challenge of determining that a turbidite formed as a result of the shaking by an earthquake.

Paleoseismology of the CSZ

The rugged coastline of the Cascadia region includes 11 underwater canyons, and their deep-sea sediments have been studied since the late 1960s.



Underwater Canyons of Northern Cascadia

USGS map, - PD, via usgs.gov

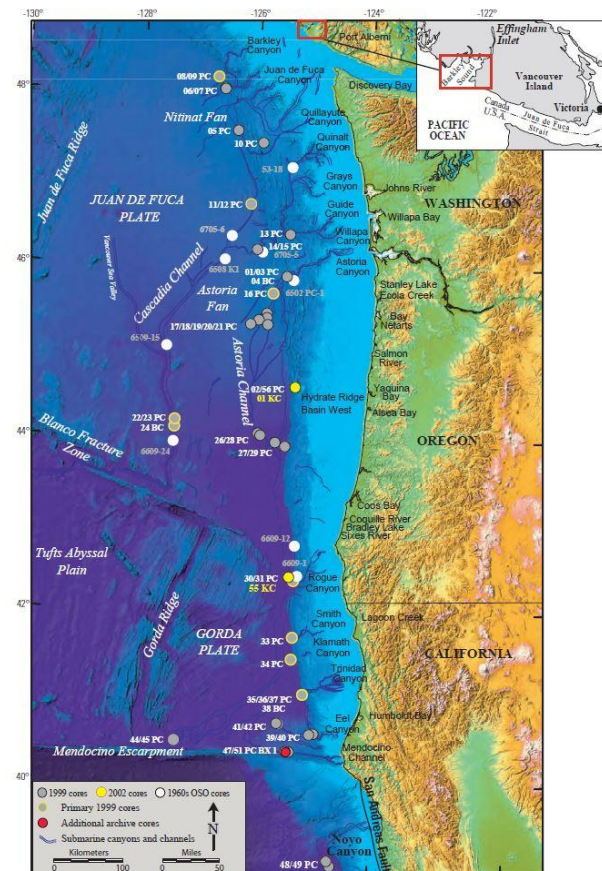
This bathymetric map depicts three underwater canyons, Juan de Fuca Canyon, Quinault Canyon, and Astoria Canyon, off the shore of Washington state. Turbidite deposits in these canyons have been studied extensively by both sedimentologists and seismologists.

While examining an archive of deep-sea core samples, John Adams, a seismologist with the Geological Survey of Canada, noticed a sequence of turbidites that correlated with the volcanic ash from the Mount Mazama eruption.

This eruption, which led to the formation of Crater Lake, was radiocarbon dated to 6845 ± 50 years BP. Adams found that 13 turbidite deposits formed above the ash layer and that the same sequence was present at widely separated sites: Cascadia Channel, Astoria Canyon, and Cape Blanco. The turbidites at each location occurred fairly regularly, every 590 ± 170 years on average. After evaluating possible deposition mechanisms, Adams hypothesized

that the best explanation for the synchronous sequence involved turbidity currents triggered by 13 great earthquakes in the Cascadia Subduction Zone (Adams, 1990).

Chris Goldfinger, an Oregon State University marine geologist and geophysicist, and C. Hans Nelson, a geologist with the Instituto Andaluz de Ciencias de la Tierra, Universidad de Granada, Granada, Spain, along with other scientists designed an investigation to test Adams' hypothesis. Since turbidites can be generated by a variety of different phenomenon, the researchers presumed the study would disprove the conjecture that the synchronous turbidite sequence was caused by great earthquakes. The project involved collecting a new set of core samples during two cruises in 1999 and 2002.

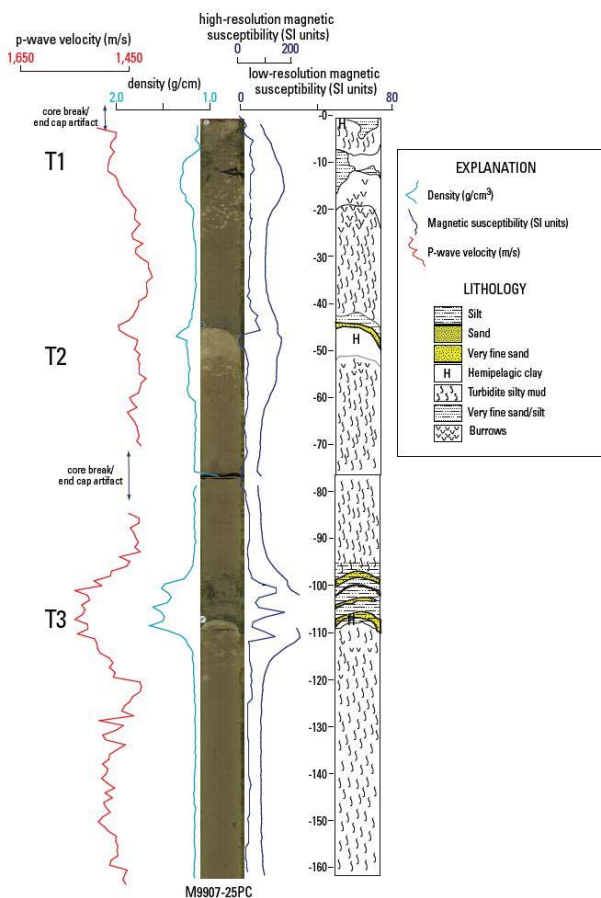


Core Sampling Sites

Figure 2. from (Goldfinger et al., 2012), - PD, via usgs.gov

This map shows the locations of the deep-sea core samples. The sites of the original 1960s samples used by Adams are indicated by the white circles. Gray circles represent the 44 samples collected in 1999, while yellow circles correspond to the four 2002 cores.

The samples were analyzed to determine key characteristics, such as p-wave velocity, gamma-ray density, magnetic susceptibility, and radiocarbon age.



Section of a Typical Core Sample with Different Measurements

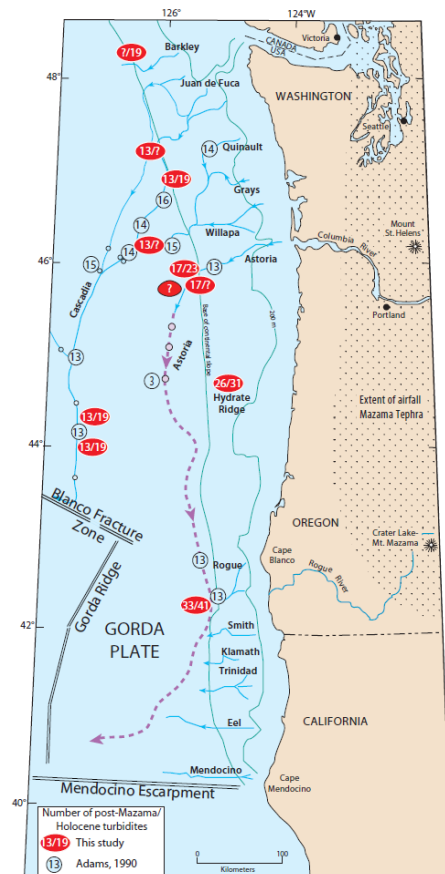
Figure 5. from (Goldfinger et al., 2012), - PD, via usgs.gov

This core sample section, which is from the Cascadia Channel, shows three turbidites that are labeled T1 to T3. T1 is associated with the 1700 megathrust earthquake. P-wave velocity measurements appear on the

left and are used to evaluate the sample's mechanical strength, deformation, and porosity. Gamma-ray density, which is indicated in light blue, provides information on bulk density, composition, and fluid content. The dark blue plots represent magnetic susceptibility which is used in differentiating depositional processes, determining magnetic domain alignment, and identifying the presence of iron-titanium oxide and iron sulfide minerals. The sample lithology is displayed on the right.

Study Findings

A detailed comparative analysis of the 1999 core samples confirmed the sequence of 13 post-Mazama turbidites that Adams had observed. Along the northern Cascadia margin, the synchronous sequence was found to extend to 19 turbidite events dating back to the Holocene-Pleistocene boundary (~10,000 years ago). Sequences up to 41 turbidites were detected in southern Cascadia.



Number of Post-Mazama and Holocene Turbidites at Various Core Sample Sites

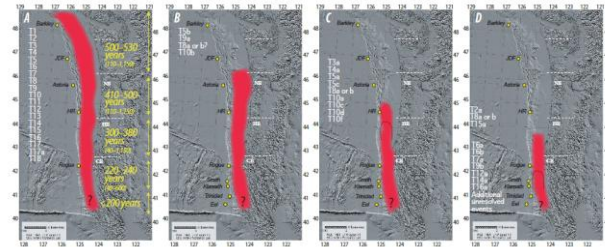
Figure 51. from (Goldfinger et al., 2012), - PD, via usgs.gov

This map summarizes the number of turbidites observed with the new core samples (red ovals) and those used by Adams (circles). Although some samples exhibited slight variations, the overall number and synchronicity of the turbidites was confirmed across different CSZ sites.

The Adams hypothesis that the synchronous turbidite sequence was created by great earthquakes was evaluated by examining evidence from sedimentology, tests of synchronicity, stratigraphic correlation, and an analysis of non-seismic triggers. The Cascadia sediments were found to be consistent with known earthquake-generated turbidites which have wide areal extent, considerable thickness, and coarse grain size. Synchronicity tests were verified not only for the original 13 post-Mazama turbidite sequence, but were extended to include the 19 Holocene turbidites. Using radiocarbon dating along with matching grain size “fingerprints”, stratigraphic correlation was established across widely-separated sites. Different triggering mechanisms were analyzed in terms of recurrence rates, volume, and deposition depth and pattern. They were found to be inconsistent with observed structures in the Cascadia area. However, with the inherent difficulty of conclusively proving that earthquakes are the triggering mechanism for the Cascadia turbidites, Adams’ hypothesis remains circumstantial, but the supposition has been strengthened by the more comprehensive, up-to-date results.

Rupture Length and Recurrence Interval

The correlated turbidite record along with radiocarbon dating provides information for estimating the rupture length and recurrence interval of CSZ earthquakes.



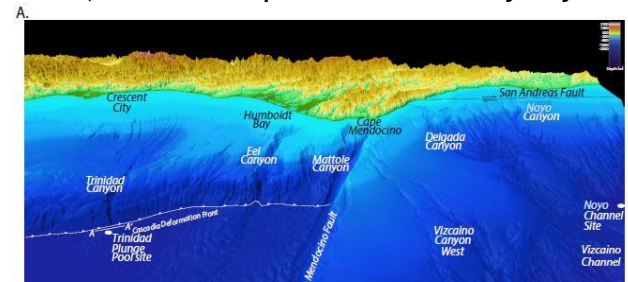
Rupture Extent and Recurrence Interval

Figure 55 from (Goldfinger et al., 2012), - PD, via usgs.gov

These annotated maps show the rupture extent for four different segments for the past 10,000 years. Segment A on the left corresponds to full-margin ruptures along the north-central Cascadia area. The recurrence interval is 500-530 years for the 19 associated turbidite events. Segment B on the middle left involves a mid-southern rupture and is represented by 3-4 events with a recurrence interval of about 410-500 years. The southern rupture starting from central Oregon appears on the middle right as segment C. It is represented by 10-12 events and has a recurrence interval of 300-380 years. Segment D on the right has an extent from southern Oregon to northern California. It is represented by 7-8 events and has a recurrence interval of 220-240 years.

Accidental Sample and Discovery

During the 1999 research cruise, a navigation error caused the drill ship to be located 90 km (56 mi) south of Cape Mendocino. Although the location over the Noyo Canyon was part of the domain of the San Andreas Fault, a core sample was taken anyway.



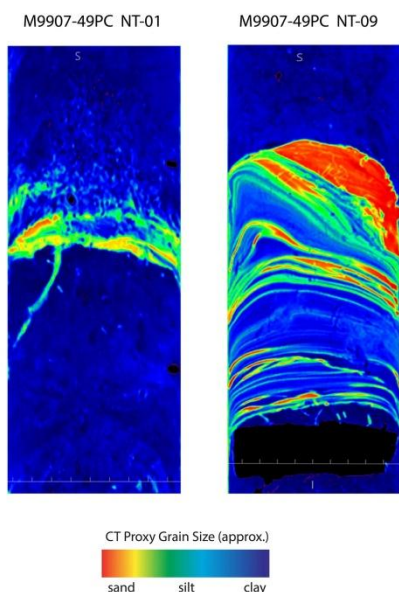
Perspective View of Southern Cascadia Subduction Zone, Mendocino Triple

Junction and Northern San Andreas Fault

Figure 2A. from (Goldfinger et al., 2025)

In this illustration, which is looking northeast, the southern CSZ appears on the left; the Mendocino Fault and Triple Junction are at the center; and the NSAF is on the right. The red dot indicates the original Noyo Channel sample site.

An examination of the sample revealed that some turbidites were deposited in pairs with a very coarse-grained sandy element on top of a fine-grained layer. This unexpected arrangement, called an inverted doublet pair, represents an upside-down layering pattern of a typical turbidite.



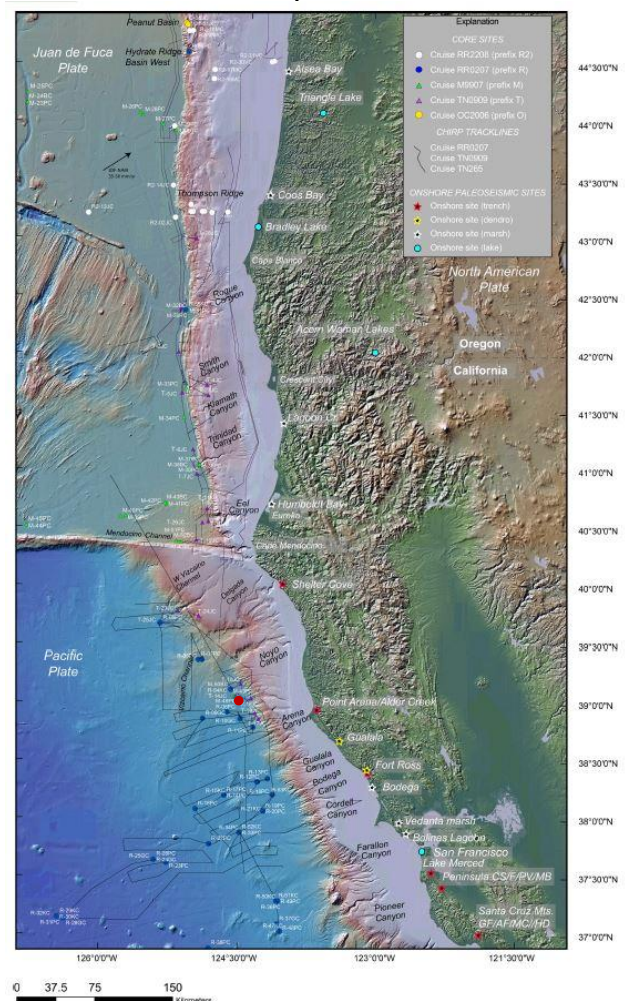
X-Ray Computed Tomography (CT) Scan of the 1999 Noyo Canyon Core Sample

Chris Goldfinger image, - CC_BY_SA-4.0

CT scans help identify the composition and thickness of turbidite layers. The scan on the left shows a turbidite that may have been generated around the time of the 1906 San Francisco earthquake. The scan on the right corresponds to an earthquake that occurred approximately 1500 years ago. It shows an inverted doublet which appears as a turbidite with increased thickness. A closer examination, however, reveals two stacked subunits where a coarse sand layer was deposited on top of a fine silty base.

The sand layer may be due to a San Andreas seismic event, while an earlier Cascadia quake may have led to the deposition of the silt subunit.

The finding launched an investigation into the timing of seismic events occurring along the southern Cascadia margin and the Northern San Andreas Fault (NSAF). The study involved collecting and analyzing a new set of core samples.



Bathymetry and Core Sampling Sites Around Southern Cascadia and Northern California

Figure 1. from (Goldfinger et al., 2025)

This relief map shows the bathymetric data that was compiled for the project along with core sampling sites. The red dot indicates the original Noyo Channel sample site.

The core samples were used to build a

paleoseismic history of the NSAF. During the past 2800 years, seismic activity along the NSAF has been recorded in 15 turbidites, which may likely include one from the 1906 San Francisco earthquake. The average event repeat time is ~200 years which is similar to the ~240 year value obtained from onshore measurements. The repeat time for southern Cascadia turbidites is ~220 years which is similar to that of the NSAF (Goldfinger et al., 2008).

Interactions Between the CSZ and the NSAF

The comparable repeat times of the southern Cascadia and NSAF seismic events suggest possible interactions between the two fault systems. Inverted doublets may represent evidence of partial fault synchronization where large earthquakes may trigger events on adjacent faults. A Cascadia event may trigger a turbidity current that leads to a turbidite base layer. If a NSAF quake is later triggered by the Cascadia event, the resulting turbidity current may then deposit a layer on top of this base.

Earthquake stress transfer, which also known as Coulomb stress transfer, has been proposed as a mechanism behind the fault interactions. When an earthquake occurs, stress is relieved on certain faults, but may also move along to adjacent faults triggering subsequent events. Such transfers have been observed and reported in a number of situations. Faults with similar slip rates and geometry may be more prone to synchronization (Goldfinger et al., 2025).

The CSZ and NSAF systems, however, represent a more complex situation with a shallow-dipping subduction zone and a vertical strike-slip fault located around the Mendocino Triple Junction. Stress transfer may be less efficient, but the regional stratigraphy suggests partial synchronization where the CSZ ruptures first and followed by

a NSAF rupture. Thirteen of the 15 NSAF turbidite events were preceded by Cascadia events where the timing difference varied from 0-80 years and averaged 25-45 years (Goldfinger et al., 2008).

References

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- Schulz, K. (2015) The really big one. *The New Yorker* July 20, 2015, 52-59. ♦ ♦ ♦



Arizona Rocks 159

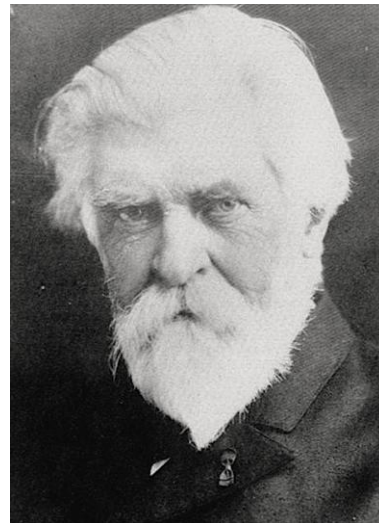
Text & photos by Ray Grant

The earliest published information about the mineralogy of Arizona was in 1866 by William Blake. It was in the Annotated Catalog of the Principal Mineral Species Hitherto Recognized in California and the adjoining States and Territories. It was prepared by Professor Blake as a report to the California State Board of Agriculture, for whom Blake acted as geologist. He was also Professor of Mineralogy, Geology, and Mining at the "College of California" parent to the University of California, Berkeley. The report listed 12 minerals from Arizona., They are mainly copper and silver minerals.

In 1895 Blake moved to Arizona and was University of Arizona Professor of Mining and Geology from 1895-1909 and was appointed Arizona Territorial Geologist in 1898. He published the first list of minerals from Arizona in

ANNOTATED CATALOGUE
OF THE
PRINCIPAL MINERAL SPECIES
HITHERTO RECOGNIZED IN
CALIFORNIA,
AND THE
ADJOINING STATES AND TERRITORIES;
BY WILLIAM P. BLAKE,
GEOLOGIST OF THE CALIFORNIA STATE BOARD OF AGRICULTURE, AND PROFESSOR OF MINERALOGY, GEOLOGY, AND MINING, IN THE UNIVERSITY OF CALIFORNIA,
BERKELEY.
MARCH, 1866.
SACRAMENTO:
PRINTED FOR THE AUTHOR.
1866.

1909. The Minerals of Arizona Their Occurrence and Association was a report to Governor Kibbey. It is 64 pages and lists 102 minerals. It also has a short section Materials of Construction that covers rocks like granite and limestone. Blake passed away in California in 1910.



William P. Blake
1826-1910



William Blake in his office at the University of Arizona, 1902.

MINERALS OF ARIZONA

Their Occurrence
And Association
With Notes on Their
Composition

A REPORT
To the Hon. J. H. KIBBEY
Governor of Arizona

BY
William P. Blake
Territorial Geologist



Pinal Geology & Mineral Museum

Pinal Museum and Society News

351 N. Arizona Blvd., Coolidge, AZ

Pinal Geology and Mineral Society next meeting

September 16, 2026

Meetings are the third Wednesday at 7pm, doors open at 6:00 so stop in early to have a look around and see what is new--we have added new displays and will have new loaned specimens on display!

www.pinalgeologymuseum.org

Ray Grant ray@pinalgeologymuseum.org

Pinal Geology and Mineral Museum Winter Hours

The museum is open Wednesday through Saturday from 10 - 4
admission is free.

Groups can arrange special visits, please call
520-723-3009.



Our two most recent museum acquisitions via donation.

A fabulous fish-tail twinned gypsum from Mexico was donated by Wallace Grant. He's the brother of Ray Grant—museum founder.

The other piece is a fantastic slickenside specimen gifted to the museum by the Dave Eddy estate of Glendale, AZ.

Ron Gibbs will present a new program "Shorts" that will cover 8 topics of interest. Ron has presented at clubs and symposia all over the West and Canada and is a co-author on the 4th edition of Mineralogy of Arizona.

Meeting starts at 7pm and doors will be open at 6pm on Wednesday, September 16. As usual, we will feature a silent auction, home baked goodies and drinks, and five free raffle prizes!

**Sun City Rockhound Mineral Museum
Sundial Recreation Center
14801 N. 103rd Ave.
Sun City, AZ 85351**

The museum offers private party tours for schools, clubs and individuals. We'd love to show off our museum to your club or private group. If you are interested, please contact the museum at scrockmuseum@gmail.com.

Please take a minute to check out our new website at scrockmuseum.com.

**Misnomer Specimen: – The ‘Jasper’
That’s Actually Calcite**

**By Carol Bankert-George
Museum Director Emeritus**

Over the years, visitors have often asked why the museum did not have a specimen of bumblebee Jasper on display. After receiving this question multiple times, I decided to locate a suitable specimen to donate to the museum. I recently acquired a piece that is now on display in Jasper cabinet, number 3. While researching the specimen, I learned that bumblebee jasper is a lie! It's not a true jasper. True jasper contains chalcedony (microcrystalline quartz). Bumblebee Jasper is a trade name. This mineral is composed of calcite, aragonite, with its yellow coloration derived from sulfur, and its orange hues from realgar and orpiment.

Because these minerals can be considered hazardous, questions arose regarding safe handling and appropriate display classification. After careful consideration, the specimen was placed with Jasper's, as that remains its common name and where guests would look for specimens on display.

Was this insight into Bumblebee Jasper new information to you as it was to me?



**Summer Hours
May-September
10am-1pm
Saturdays only
Winter Hours
October – April
10 am to 1 pm
Closed Thurs., & Sunday**



New artwork on display

On loan from Catie Sandoval of the Arizona Mining, Mineral and Natural Resources Education (AMNRE) Museum are several



framed drawings by artist Wendell E. Wilson. You will find them between display cabinets 7 and 8. Wendell is a prominent figure in the mineralogical community recognized for his rare combination of artistic talent and geological expertise. He has

served as editor-in-chief and publisher of the *Mineralogical Record* publication since 1978. Dr. Wilson is a long-time Arizona resident, residing in Tucson

Arizona Rock and Gem Shows

Annual show

Payson Rimstones' Rock Club

September 18-20, 2026

Fri. 1-6, Sat. 9-5, Sun. 10-4

Adults \$3 (Fri) and \$5 (Sat/Sun)

Children under 13 Free

Mazatzal Hotel and Casino Events Center

Highway 87, Mile Marker 251,

Website:

<https://www.rimstonesrockclub.org/>

Gila County Gem & Mineral Society Show and sale

November 7, 2026

**Bullion Plaza Cultural Center &
Museum Yard**

150 Plaza Circle

Sat. 9-2

Free Admission

Miami, AZ

The 2026 Sedona Gem and Mineral show will be held on October 3rd & 4th - start planning ahead. (We are breaking tradition from our normal 3rd week show!)

Annual Show

Sedona Gem and Mineral Club

October 3-4, 2016

Sat. 10-5, Sun. 10-4

Adults \$5 Cash Only

Children 12 and under Free

Free Parking

Sedona Red Rock HS

995 Upper Red Rock Loop Rd

Annual show

Helzarockin' Gem & Mineral Show

West Valley Rock & Mineral Club

October 9-11, 2026

Buckeye Equestrian & Events Center

Fri. 9-6, Sat. 9-6, Sun. 9-4

Adults \$5

Under 13 Free

10300 S Miller Rd

Buckeye, AZ

Wickenburg Gem and Mineral Show Nov 28 & 29, 2026



Free Admission
gemclub.info



Jewelry
Fossils
Minerals

Over 40 Vendors Best Rock Contest Raffle
Door Prizes Kid's Area Silent Auction

Hassayampa Elementary School
251 South Tegner Street Wickenburg, AZ
9am - 5pm Saturday • 10am - 4pm Sunday

54TH ANNUAL

FLAGG GEM & MINERAL SHOW

A TRIBUTE TO PAUL HARTER



MALACHITE PS. AZURITE, QUARTZ
REDMONT MINE, YAVAPAI, ARIZONA
EVAN & MELISSA JONES COLLECTION
PHOTO BY JEFF SCOVIL



JAN

8 TO 10

2027



MALACHITE PS. AZURITE
BISBEE, COCHISE, ARIZONA
PAUL HARTER COLLECTION
PHOTO BY JEFF SCOVIL



NIOBASITE, MALACHITE PS. AZURITE
SILVER HILL MINE, GLENN, COCHISE, ARIZONA
PETE KALUSSEN COLLECTION
PHOTO BY JEFF SCOVIL



VANADINITE PS. WULFENITE
BOWLEY MINE, THESIA, PINTO MOUNTAINS, MARICOPA, ARIZONA
PETE KALUSSEN COLLECTION
PHOTO BY JEFF SCOVIL



MALACHITE PS. AZURITE, QUARTZ
LONE OAK PIT MINE, GILA, ARIZONA
PAULA & LES FRESNAY COLLECTION
PHOTO BY JEFF SCOVIL

MESA COMMUNITY COLLEGE NE CORNER
OF US 60 AND DOBSON ROAD
FRI-SAT 9AM - 5PM | SUN 9AM - 4PM
www.Flaggshow.info



FREE ADMISSION | FREE PARKING | FREE SAMPLES FOR KIDS

Arizona Rock and Gem Clubs



Apache Junction Rock & Gem Club

Meetings are on the 2nd Thursday
 Next Meeting: September 10, 2026, 6:30 pm
www.ajrockclub.com
 @ Club Lapidary Shop
 2151 W. Superstition Blvd., Apache Jct.



Daisy Mountain Rock & Mineral Club

Meetings are on the 1st Tuesday
 (unless a Holiday then 2nd Tuesday)
 Next Meeting: September 8, 2026, 6:30 p.m.
www.dmrmc.com
 @ Anthem Civic Building
 3701 W. Anthem Way, Anthem, AZ



Maricopa Lapidary Society, Inc

Meetings are on the 3rd Tuesday
 Next Meeting: September 15, 2026, 7:00 pm
www.maricopalapidarysociety.com
 @ North Mountain Visitor Center
 12950 N. 7th St., Phoenix, AZ



Mineralogical Society of Arizona

Meetings are usually on the 3rd Thursday
 (Except June & December)
 Next Meeting: September 17, 2026
 Meeting Location: Franciscan Renewal
 Center, Piper Hall
 5802 E. Lincoln Drive, Scottsdale,
 Go to our website for more info.
www.msaaaz.org



Pinal Geology & Mineral Society

Meetings are on the 3rd Wednesday
 Next Meeting: September 16, 2026, 7:00 pm
www.pinalgeologymuseum.org
 351 N. Arizona Blvd., Coolidge



West Valley Rock & Mineral Club

Meetings are on the 2nd Tuesday
 Next Meeting: September 8, 2026, 6:30 pm
www.westvalleyrockandmineralclub.com
 Buckeye Community Veterans Service Center
 402 E. Narramore Avenue, Buckeye, AZ



Gila County Gem & Mineral Society

Meetings are on the 1st Thursday
 (unless a Holiday then the next Thursday)
 Next Meeting: September 3, 2026, 6:30 pm
www.gilagem.org
 Club Building
 413 Live Oak St, Miami, AZ



Wickenburg Gem & Mineral Society

Meetings are on the 2nd Friday
 (February & December on the 1st Friday)
 Next Meeting: September 11, 2026, 7:00 pm
www.wickenburggms.org
 @ Coffinger Park Banquet Room
 175 E. Swilling St., Wickenburg, AZ

ESM's Meeting Notice

ESM's next meeting will be at North Mountain Visitor Center, 12950 N. 7th St., Phoenix, on Tuesday, TBA 2026, at 6:30 p.m.

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AZ Leaverite Rock & Gem Society

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www.flaggmineralfoundation.org

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Maricopa Lapidary Society

<http://maricopalapidarysociety.com/>

Mineralogical Society of AZ

www.msaaaz.org

Payson Rimstones Rock Club

<https://www.rimstonesrockclub.org/>

Sossaman Middle School

White Mountain Gem & Mineral Club

www.whitemountain-azrockclub.org

Sun City Rockhound Club & Mineral Museum

<https://suncityaz.org/recreation/clubs/rockhound-club-mineral-museums/>

Wickenburg Gem & Mineral Society

<http://www.wickenburggms.org>

www.facebook.com/pages/Wickenburg-Gem-and-Mineral-Society/111216602326438

West Valley Rock and Mineral Club

<http://www.westvalleyrockandmineralclub.com/>

Staples Foundation

www.staplesfoundation.org

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Mission

Our Mission is to excite and inspire all generations about earth sciences through educational outreach.

Vision

We envision a community where students and the general public have curiosity about, passion for, and understanding of the underlying principles of earth sciences.

For more information about the ESM,
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arrange for a school visit or
Community function, go to:
www.earthsciencemuseum.org.

NOTICE:

ESM's next meeting will be at North Mountain
Visitor Center, 12950 N 7th St, Phoenix, on Tuesday,
TBA 2026, at 6:30 p.m.

THANK YOU FOR YOUR CONTINUING INTEREST & SUPPORT!!!

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