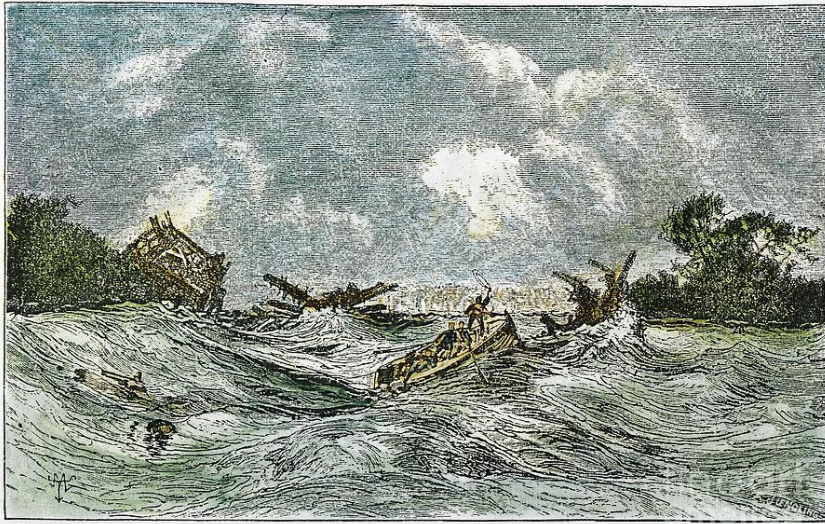




The New Madrid Earthquake, 1990



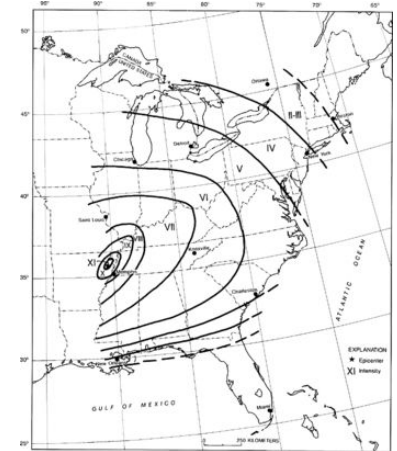
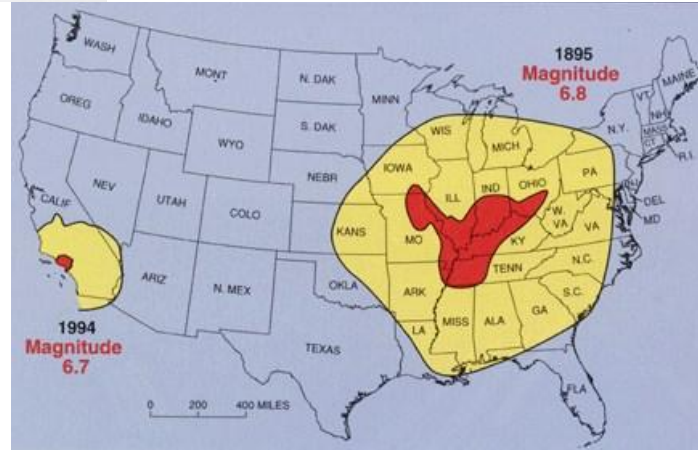
New Madrid, Missouri



SCENE OF THE GREAT EARTHQUAKE IN THE WEST.



1811-1812 Earthquakes —the strongest in US history



Earthquake risks remain today

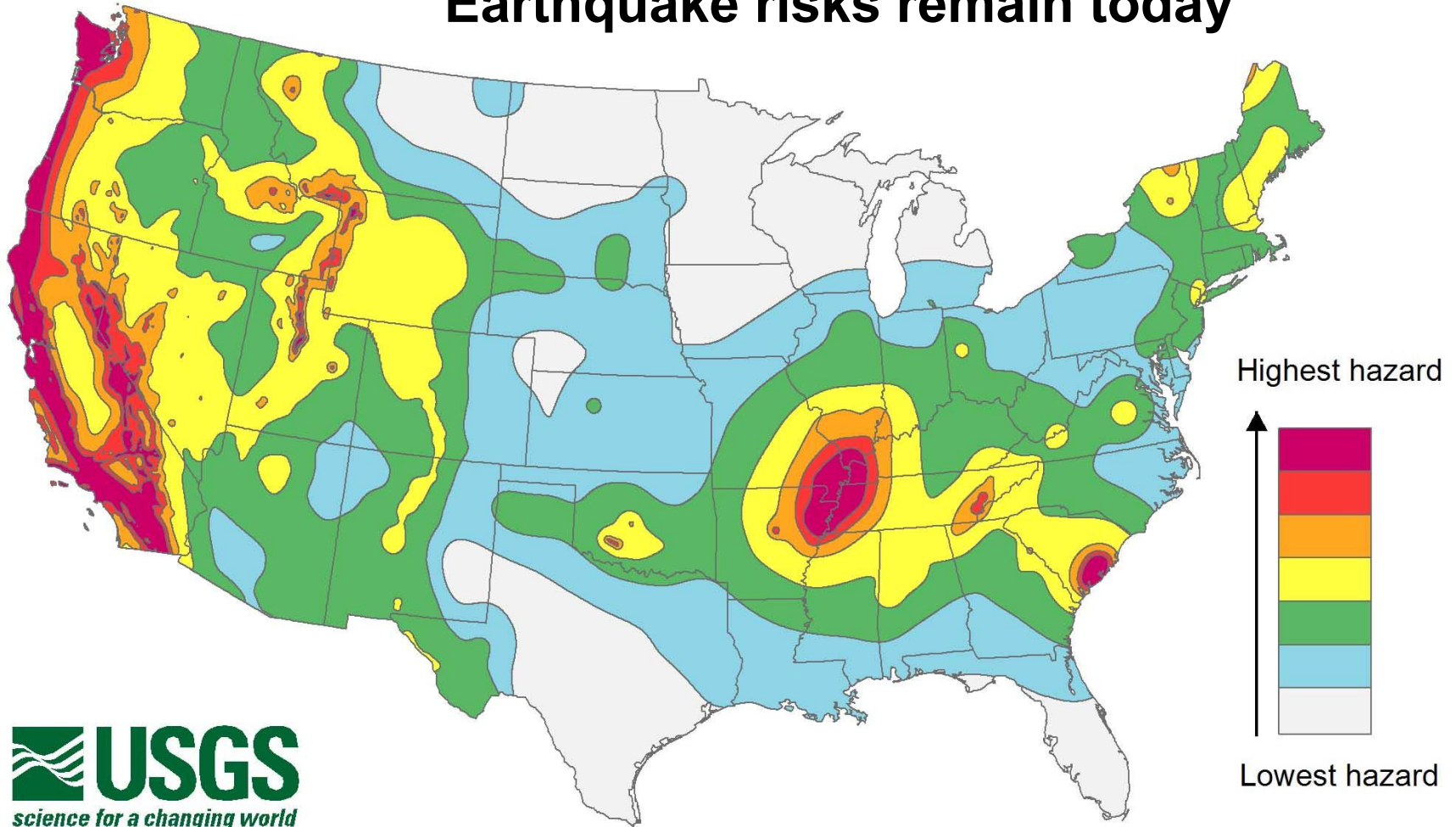


TABLE I.

DATES OF GEOLOGICAL DANGER (HIGH TIDAL FORCES)

17.811	Sept. 1985	*	(MEXICO CITY EARTHQUAKE) (19 Sept)
17.381	Oct. 1985	* *	(VALCENHO - KILAUEN, HAWAII) (18 Oct)
13.944	Nov. 1985	* * *	(VALCENHO - COLOMBIA, THIRD NEW GUINEA, USSR) (31 Nov)
11.501	Dec. 1985	* *	
8.055	Jan. 1986	*	

NEW
MOON

6.371	Nov. 1986	* *	
3.945	Dec. 1986	* * *	
31/5	DEC. 1986	* * * *	(30°)
28.055	JAN. 1987	* * *	
24.609	FEB. 1987	* *	

21.722	Dec. 1987	*	
18.776	Jan. 1988	* *	
15.031	Feb. 1988	* * * *	
14.586	Mar. 1988	* *	
11.190	Apr. 1988	*	

23.334	Aug. 1989	*	
19.889	Sept. 1989	*	
17.443	Oct. 1989	* *	
13.998	Nov. 1989	*	
11.552	Dec. 1989	*	

9.394	Oct. 1990	*	
5.849	Nov. 1990	* *	
3.5	Dec. 1990	* * *	(30°)
31.055	Dec. 1990	* *	
27.609	Jan. 1991	*	

FULL
MOON

25.419	Nov. 1991	*	
21.974	Dec. 1991	* *	
18.528	Jan. 1992	* * * *	(20° N. Lat.) (18 Year High) (One of 3 Highest Highs in Over 1600 Years)
15.083	Feb. 1992	* *	
12.637	Mar. 1992	*	

9.394	Jan. 1993	*	
6.151	Feb. 1993	*	
5.706	Mar. 1993	* *	

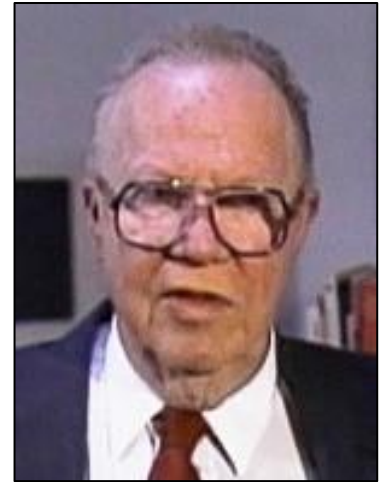


- November, 1989.** The *Memphis Commercial Appeal* reports on a lecture by Iben Browning, who has analyzed the geological conditions of the famous 1811-1812 earthquakes and finds that similar conditions will occur again next year, on **December 3, 1990**. Browning is a business consultant on meteorological and geological issues and publishes a newsletter on these topics. His reasoning is based on modeling the geological forces of excess tidal loading which will increase the likelihood of an earthquake at a similar scale. He repeats his projection a few weeks later in an invited speech at the Missouri Governor's Conference on Agriculture.

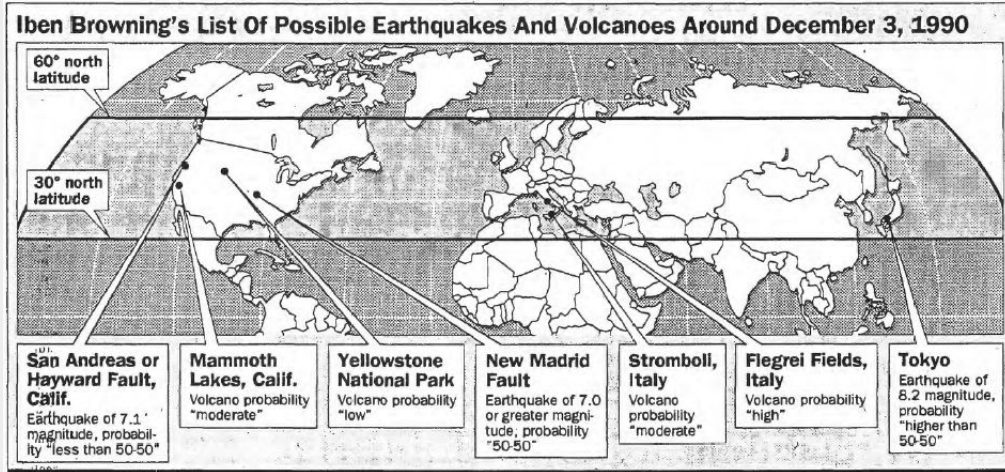
► *What is your response at this stage?*



- As a measure of his credibility, Dr. Browning claims to have correctly projected the earthquake in Loma Prieta, California, earlier this year, and also the devastating eruption of the Mount St. Helens volcano in Washington in 1980.



► *Does this information alter your view?*



- June 26, 1990.** Dr. Browning has continued his lecture circuit and now the *St. Louis Post Dispatch* has begun to cover the story. Today, it publishes a map of the seven global locations implicated in Browning's projections.

► *Your view?*

Quake Prediction Taken Seriously

By William Allen
Of the Post-Dispatch Staff

DESPITE CRITICISM by some scientists, a prediction of a New Madrid Fault earthquake on Dec. 3 should be taken seriously and not dismissed as unscientific, an earthquake expert said Friday.

"From a scientific viewpoint, we can neither verify nor discredit this projection," said the expert, David Stewart. He is the director of the Center for Earthquake Studies at Southeast Missouri State University, in Cape Girardeau.

Stewart made the comment in a telephone interview after releasing a detailed memo assessing an earthquake forecast by Iben Browning, a scientist in Sandia Park, N.M. Stewart sent the memo June 18 to federal and state emergency management officials and scientists.

Browning has predicted that unusually strong gravitational forces coming to a head on Dec. 3 will increase the chances of a destructive earthquake in the New Madrid Fault. The prediction has caused some officials in regions near the fault to cancel

"What Dr. Browning is doing cannot be explained merely by chance. Although his accuracy is not 100 percent, his methodology does seem to be promising and worthy of serious and thorough consideration."

DAVID STEWART, director of the Center for Earthquake Studies at Southeast Missouri State University

vacations and school around that date and to plan earthquake-preparedness exercises.

The New Madrid Fault runs for about 120 miles through part of southeastern Missouri, Southern Illinois, Tennessee and Arkansas. Seismologists rate the chances of a damaging earthquake of 6.0 or better on the Richter scale at about 50 percent at some time by the end of the decade.

Browning expects a major earthquake on Dec. 3 in either the New Madrid Fault, the Hayward Fault in northern California or a fault near Tokyo, Japan. There is an 87 percent

chance that one of the three will erupt on that date, he said.

Browning's prediction for the New Madrid Fault area has been criticized by earthquake specialists at St. Louis University and Memphis State University. They said it should not be taken seriously because scientific studies have found no significant link between gravitational forces and earthquakes.

Stewart, a seismologist, went to New Mexico to interview Browning at length. He discussed Browning's work with several clients who subscribe to Browning's newsletter on climate and

geological events and their impact on the economy.

Although not "formally trained" in fields dealing with earthquakes and volcanoes, Browning is highly respected among businesspeople and investors, Stewart said in the memo. His accuracy on natural disaster predictions "is said by various people to be 50 percent at worst and 90 percent or better most of the time," the memo says.

Browning predicted the earthquake on Oct. 17 in Loma Prieta, Calif., and the eruption of Mount St. Helens in May 1980. He also accurately predicted the earthquake in September 1985 in Mexico City, Mexico; the volcanic eruption in November 1985 in Colombia and the earthquake in 1971 in San Fernando, Calif.

"What Dr. Browning is doing cannot be explained merely by chance," Stewart said. "Although his accuracy is not 100 percent, his methodology does seem to be promising and worthy of serious and thorough consideration."

Browning has said that if the fault is "loaded," the gravitational forces would simply act to "pull the trigger."

- **July 21.** A *Post-Dispatch* headline reports, "Quake Prediction Taken Seriously." The article cites David Stewart, Director of the Earthquake Research Center at Southeast Missouri State University, who has vouched for Browning's expertise to his colleagues. In a separate comment he said, "Here's a man who verifiably has hit several home runs, and he's up to bat ... you can't ignore the batting record."

► *status update?*

Officials heed quake warning

Springfield could expect wave of tremor's refugees

By J. Lee Howard
The News-Leader

A prediction of a December earthquake along the New Madrid fault is being taken seriously by state and local officials who are planning for the worst.

Iben Browning, a 72-year-old New Mexico climatologist, projects a 50-50 chance the quake will hit Dec. 3, give or take a day. But he said the quake also could strike in the Hayward fault in the East Bay in San Francisco or in Tokyo.

Browning is no star gazer, palm reader or swami. But the accuracy of his "mathematical projections" — he eschews the word "predictions" — has astounded and baffled geologists and seismologists, many of whom question his techniques.

Browning has predicted seven major earthquakes, including the Oct. 17, 1989, Loma Prieta earthquake that ravaged San Francisco.

"He's been correct on so many other things," said Candace Adams of the Springfield-Greene County Emergency Management Office. "I think everybody ought to take him seriously."

Springfield probably wouldn't get the bulk of the shock from a New Madrid quake, however. What Springfield may get, Adams said, is about 200,000 refugees from eastern Missouri.

The New Madrid fault runs about 120 miles through southeastern Missouri, southern Illinois, western Tennessee and Arkansas. In 1812, the New Madrid fault unleashed an earthquake believed to be the worst in U.S. history.

Seismologists have predicted about a 50 percent chance for an earthquake of 6.0 on the Richter scale to strike the fault sometime before the turn of this century.

Browning, however, is the only one with a date in mind.

He makes his projections by calculating tidal activity and the pressures the sun and moon exert on the Earth. Mysticism doesn't play a role in his projections, he said.

"I don't predict anything," Browning said from his home in Sandia Park, N.M., Friday. "That's a lot of garbage."

Browning referred to a scientific paper recently brought to his attention. The paper was published in 1967 in the journal "Icarus," and was authored by Gene P. Tamrazyan, a scientist at The Institute of Geology at the U.S.S.R. Academy of Sciences in Baku, Azerbaijan.

Browning said Tamrazyan's paper, which points to the influences tidal waves have on earthquakes, supports the theories he uses in making his projections.



Iben Browning
Predicting Dec. 3 earthquake



- **August 5.** The Office of Emergency Management in Springfield-Greene County, Missouri, notes that Browning has "been correct on so many things. I think that everybody ought to take him seriously."

Officials Ponder Closing Schools

NEW MADRID, Mo. — School officials here wonder whether they should cancel classes the first few days of December because of a scientist's prediction that an earthquake may occur then.

Ultimately, parents may make the decision for them.

Scientists are skeptical about Iben Browning's forecast of a 50-50 chance for a quake in the New Madrid fault between Dec. 1 and Dec. 5.

But many parents say they are planning to keep their children out of school and maybe even leave town.

"As a board and administration, we do not place much credence in the prediction," said Robert B. Payne, superintendent of the New Madrid County Central School District. "The problem with schools is, it's not what's true so much as it is what's perceived to be true."

The first two days of that period are a weekend, but the final three are a Monday-Wednesday. Some districts in southeast Missouri and northeastern Arkansas have already decided to close on those days.

If a major quake strikes during school hours, a large fraction of the casualties would be schoolchildren, federal studies of the region show.

Payne said district officials will have to be practical in deciding whether to close schools.

If most children will be away, "I'm not sure what we'd gain by having school," he said.

Officials have decided to close public schools in East Prairie, which sits atop the fault northeast of New Madrid.

The East Prairie R-2 School District board took the action as a precaution because "our buildings are hazardous for earthquakes," said Judy Lewis, a secretary in the district office. The district has about 1,400 students.

In Sikeston, Mo., public schools are scheduled to be open, but St. Francis Xavier Catholic School will be closed,

city officials said.

School officials in Wilson and Earle, Ark., also have decided to close school.

Teachers in the South Mississippi County School District 57 will report to school Dec. 3-5, but the district's 2,400 students will not, said Frances Little. She is a secretary in the superintendent's office in Wilson, Ark.

Teacher staff development days normally held at other times of year have been rescheduled for those days.

District officials canceled classes because "a lot of our parents are concerned," Little said.

In New Madrid, district officials are more worried about the fact that a quake could occur at any time than they are about the Dec. 3 prediction, Payne said.

The district has been preparing itself for an earthquake ever since last October's quake in northern California brought public attention to the threat.

"When a neighbor's house burns, everyone starts reading their fire insurance," he said.

The district's 2,300 students attend buildings ranging in age from 4 to 50 years old. The buildings were not designed with earthquakes in mind.

District officials have attended quake seminars and issued a preparedness manual to the staff. A radio system has been installed in each building so they can communicate if a quake knocks out phone service.

They are about to begin stocking school buildings with blankets, first aid kits and other supplies. Maintenance crews will attach bookcases to walls and may put plastic film on windows to prevent shattering.

And the New Madrid schools will soon have the first of four annual earthquake drills mandated by the Missouri Legislature in its last session.

— William Allen



- **September 9.** The Superintendent of the New Madrid Country Central School District announces that schools will be closed on December 3, still months away. "The problem with schools," he says, "is it's not what's true so much as it is what's perceived to be true."

Quake Rattles Region

Temblor Leaves Behind Little Damage, No Injuries, But Brings On New Jitters

By William Allen
Of the Post-Dispatch Staff
Somewhere beneath southeastern Missouri, the Earth shrugged its shoulders Wednesday. The result: an earthquake measuring 4.6 on the Richter scale.

As quakes go, this one went quickly and with little fuss. It was brief, and caused no injuries and little damage, officials said.

But it sent jitters through a region already made jumpy by predictions of a big quake along the New Madrid

HAZELWOOD DRILL is a dress rehearsal.....Page 12A
INSURANCE AGENTS are kept busy.....Page 12A
DUTCHTOWN, MO., recovers from the shake.....Page 13A

Fault in December.

The quake struck at 8:19 a.m., said St. Louis University's Sean-Thomas Morrissey, who pegged the scale at 4.6.

The quake's epicenter — about 10

miles southwest of Cape Girardeau — was not on the New Madrid Fault but was a few miles west, said Morrissey, a geophysicist.

Another tremor shook the Cape Girardeau area about 12 hours later, registering about 2 on the Richter scale, according to officials in Cape Girardeau.

The earthquake's rumblings traveled through seven states — Missouri, Illinois, Arkansas, Indiana, Kentucky, Ohio and Tennessee.

The quake caused minor damage in

small towns around the epicenter, breaking dishes, knocking pictures off walls and packing contents from cabinets and shelves.

Near Keosau, Mo., the quake broke several pieces of one woman's collection of 300 ceramic pigs.

"There was a rumbling noise like a heavy truck," said David Stewart, director of the Center for Earthquake Studies at Southeast Missouri State University, in Cape Girardeau.

Stewart, who was in a classroom at the time, said, "I shouted, 'It's an earthquake,' and everybody ducked under their desks."

Scientists agreed that Wednesday's tremor had nothing to do with the December prediction, made by Ben Browning of New Mexico.

Browning has forecast a 50-50 chance of an earthquake measuring at least 7.0 along the New Madrid Fault between Dec. 1 and Dec. 5.

Most scientists who specialize in earthquakes have dismissed Browning's forecast as ridiculous. They put the chance of a quake measuring at least 8.0 at 50-50 sometime in the next decade.

See QUAKE

- **September 26.** Southeast Missouri experiences an earthquake: enough to rattle dishware—and a sense of complacency. About 200 minor quakes occur annually in the region, most too small to notice. Various government agencies have been arguing for years that residents should be prepared for any major quake, although the timing cannot be predicted.

► *updated view?*



Karer, Elshout/Post-Dispatch
Scott Michell, a St. Louis University geophysics graduate student, holding a reading of Wednesday morning's quake.

A Major Earthquake has been projected by Dr. Iben Browning to strike this area on December 3, 1990...

Should you and your family prepare...now?
This exclusive video interview with Dr. Browning can help you decide.

Dr. Iben Browning is a remarkable man. His track record of documented projections related to geological activities is truly incredible. These include the eruption of Mount St. Helens, the devastating Novado del Ruiz volcano in Colombia and, most recently, the 1989 earthquake in San Francisco. His accuracy is of great importance to you personally: *Dr. Browning is now projecting a major earthquake on the New Madrid fault within 24 hours of December 3, 1990.*

One Eye Opening Video Tape

You may not have heard of Dr. Browning until recently. This is because he shuns the media and rarely grants interviews. However, earlier this year in an interview recorded on the announcement of his retirement at age 73, Dr. Browning sat for over an hour and a half of probing questions. He did so because he wanted to leave a permanent record for posterity. And, because he felt it important that Americans prepare now for the challenges just ahead.

It was in this interview that Dr. Browning made his detailed projection of the December 3, 1990 New Madrid earthquake. This is the same exclusive interview that has resulted in extensive coverage in regional and national news media. This is the same interview which led both the Arkansas and the Missouri National Guards to order earthquake drills for the period around December 3, 1990.

How To Obtain Your Video

For a very limited time only, a 30-minute excerpted version of Dr. Browning's interview is available for \$39. The video contains all the material directly related to his track record in geological forecasting, and his December 3, 1990 projection. If you live anywhere near the New Madrid fault, you should *seriously* consider ordering a copy.

Or, if you prefer, you may purchase the complete 100 minute interview for \$99. Thousands have been sold at that price. Either video comes with a report recapping his methodology, a list of other important "trigger" dates between now and 1993, and specific ways you can prepare for a major earthquake.

**"He is, perhaps, the most
intelligent person I've ever met."**

— Dr. David Stewart, *Center for Earthquake
Studies, Southeast Missouri State University*

Should you take Dr. Browning's projection seriously? Should you and your family take steps now to prepare? *Order your tape today and decide for yourself.*

To charge your video on Mastercard or Visa, call 1-800-528-0559. Or, return the coupon below with your check made payable to: Research Publications.

Because much of this material is time-dated, this offer ends November 15, 1990. Don't miss out on this rare opportunity to secure your personal copy of this important video. *Act Today.*

Here's How To Order

To order your copy of the videotaped interview with Dr. Iben Browning as well as the written report which accompanies it and which contains additional details on his projections as well as information on how to prepare for a major earthquake...

Call 1-800-528-0559

(Operators on duty 7am - 8pm CST. Please try again if lines are busy.)

You have two options:

1. Purchase the 30-minute video with Dr. Browning which fully describes how he projects geological events, as well as specific details on the December 3, 1990 earthquake. *30-Minute Video & Report: \$39.*
2. Purchase the unabridged 100-minute version. In addition to details on the earthquake, it contains a wide range of important information on long-term weather patterns, developing economic threats and more. *100-Minute Video & Report: \$99.*

Or, mail to: Research Publications
P.O. Box 84900, Phoenix, AZ 85071.

- **September 26.** Full-page ads appear in the local newspapers selling a 1.5-hour videotape interview of Iben Browning. They sell for \$99 each (or \$39 for a 3-minute excerpt)

COMMENTARY

A Quake On Dec. 3? Don't Bet The Farm

Prediction By So-Called Expert Stirs Unnecessary Fears

By Douglas A. Wiens

There was an undercurrent of fear in the elderly voice on the phone: "Do you think I should leave town because of the earthquake that is coming on Dec. 3?" As stories about an earthquake appear on the front pages of newspapers across the Midwest and reports circulate about schools and businesses closing on that date, the number of those phone calls increases.

Earthquake experts across the country consider this "prediction" ridiculous and unscientific, but our message is obviously not getting through to the public.

Iben Browning, a business consultant with no prior experience in earthquake studies, started the uproar. He claims that on Dec. 3, there is a 56 percent chance that tidal forces resulting from the pull of the sun and the moon will trigger an earthquake, measuring 7.0 on the Richter scale, along the New Madrid Fault near the southeastern border of Missouri. Such an earthquake would damage large portions of Missouri, Arkansas, Tennessee and Illinois, including the cities of Memphis and St. Louis.

Years of research by earthquake experts show that Browning's prediction is unfounded. These studies conclude that earthquakes occur just as often when tidal forces are low as when they are high. This is not surprising, since tidal forces are very small compared to other forces that can affect faults. For exam-



ple, and many other fault systems have a much higher likelihood of an earthquake. Why choose New Madrid?

Browning's alleged record of predicting earthquakes and his reputation in the financial community are given as evidence to support his forecast. But most of the so-called evidence for his success

ing done, but no detectable forewarning has yet been identified. We may never be able to pin down the time, place and size of earthquakes accurately enough to permit emergency measures to be taken.

On the other hand, progress has been made in long-term earthquake predictions. The Loma Prieta earthquake which caused considerable damage in the San Francisco Bay area last fall is a prime example. During the mid-1980s, several research groups identified this fault segment as particularly likely to cause a large earthquake within the next 20 to 30 years.

For the New Madrid zone, there is less data to constrain such estimates because there are fewer earthquakes and the fault is deeply buried. Various estimates suggest a 13 percent to 63 percent chance of an earthquake measuring 6.0 within the next 10 years. Such a quake would cause moderate damage near the earthquake location but would be much smaller than the catastrophic New Madrid earthquakes of 1811 and 1812.

The near-hysteria that has developed over such a groundless prediction is startling to those of us who study earthquakes daily. Apparently, wide news coverage has validated Browning's prediction in the minds of the public, despite what scientists are saying. The true motives for Browning's prediction may have been revealed recently when ads began appearing asking people to pay \$100 for

- **September 29.** The Director of the Missouri Department of Natural Resources releases a statement that, contrary to Browning, "the probability of a significant quake occurring on Dec. 3 is not greater than any other day."



- **Early-October.** Browning is interviewed on ABC's *Good Morning America*. Other TV talk shows soon feature discussion of a projected earthquake in New Madrid.

Scientists Rip Record Of Earthquake Predictor

By William Allen
Of the Post-Dispatch Staff
A national panel of earthquake experts tipped on Thursday the track record of Iben Browning, the New Mexico climatologist who predicted a greatly increased chance of a quake around Dec. 3 in the New Madrid fault.



Wesson

invited Browning to submit information about his method and record.

The council is an advisory group to the U.S. Geological Survey. It studied Browning's prediction of the request of the Central United States Earthquake Consortium, a group of emergency management officials.

The issue of Browning's track record is important because it has played a major role in the credibility of his Dec. 3 forecast with the public, the scientist said.

The panel's report says that what was alleged to be Browning's predic-

tion of the Oct. 17, 1989, California quake actually made no mention of a quake occurring anywhere in that state, much less in the San Andreas fault, where it erupted. Some businessmen who attended a talk by Browning a week before the quake had said they heard him predict it.

But according to a transcript of Browning's talk obtained by The Scientist, he had said only "There will probably be several earthquakes around the world, Richter 5-plus, and there may be a volcano or two" around Oct. 16.

The national council's report concludes that because Browning "did not specify any location or a magnitude, he can hardly be given credit for a successful prediction."

An average of 116 quakes a year worldwide have registered 6.0 or greater, so "the likelihood of such an earthquake occurring within a three-by-window is therefore very high," he report says.

The foundation of Browning's method is his projection of a band of tidal activity around the globe where the tidal pull of the moon and sun will peak at



Iben Browning
Quake forecast challenged

certain times. He has picked Dec. 3 as a time when tidal forces will be at their highest in 27 years.

In addition to the New Madrid fault, Browning has made predictions for that date for a similar quake in the Hayward Fault in northern California and a fault near Tokyo, Japan.

10-19-90

St. Louis Post-Dispatch
Reprinted by permission

10-19-90

Southeast Missourian
(Cape Girardeau, Mo.)
Reprinted by permission

Scientists rebuff prediction

By Jim Grebing
and David Hente
Staff Writers

ST. LOUIS — An ad hoc group of earthquake experts from around the nation has concluded there is no scientific basis for a forecast of a major earthquake along the New Madrid Fault around Dec. 3.

The 11-member group was appointed by the United States Geological Survey to specifically review the validity of a prediction by Dr. Iben Browning that there was a 50 percent chance that tidal forces could trigger a magnitude 6.5 to 7.5 earthquake in the region in early December.

There is no scientific basis for Dr. Browning's prediction and furthermore the prediction is a disservice to long-term efforts to address the very real earthquake hazard present in the United States," said Dr. Robert L. Wesson, of

Reston, Va., chief of the Office of Earthquakes, Volcanoes and Engineering for the U.S. Geological Survey.

Details of the report were released Thursday morning at a press conference at the St. Louis Airport Hilton Hotel.

Wesson noted that the group had talked with Dr. Browning and reviewed the methodology he used to make the forecast, but could find no basis to justify it.

Dr. Duncan Agnew, a professor at the University of California at San Diego and a member of the group that drafted the report, said they could find no basis for Browning's contention that there is a correlation between high tides and the occurrence of earthquakes.

He added that there is no basis for selecting the New Madrid Fault as ripe for failure on the dates in December.

Browning, a New Mexico climatologist and business consultant, has caused concern and



Quake expert disputes Browning —
Dr. Robert Wesson, chief of the Office of Earthquakes, Volcanoes and Engineering for the U.S. Geological Survey says a study group concluded there is no scientific basis for Iben Browning's prediction of a major earthquake along the New Madrid fault Dec. 2 or 3. (Photo by David Hente)

- **October 18.** The United States Geological Survey (USGS) responds to public concerns and issues a report that Browning's geological model is scientifically unsound, and that his "predictions" of earlier events had been so vague as to be meaningless, and thus were not validated.



The scientists released their report at a news conference at the Airport Hilton in Woodson Terrace.

Robert Wesson, who interviewed Browning at length by telephone, said the panel had found "no scientific basis for Doctor Browning's prediction" and that it was "a disservice" to citizens of the central United States, where a major New Madrid quake would be felt.

Wesson is the U.S. Geological Survey's chief earthquake scientist.

Agnew said the national panel "could see no basis for the selection of the New Madrid seismic zone as an area particularly ripe for failure."

Although they biased the Dec. 3 prediction, the scientists stressed the need to continue general preparations for a quake in the area of the New Madrid fault.

Browning was unavailable for comment. Reached by phone in Sandia Park, N. M., his wife, Florence Browning, said: "As of five weeks ago, he isn't giving interviews anymore." Browning is in ill health.

The report was prepared by a working group of 11 experts on various aspects of earthquakes, including the influence of tidal forces. The group

He Calls It 'A Fact'

State's Quake Expert Believes In Psychic Phenomena

By William Allen
Of the Post-Dispatch Staff

©1990, St. Louis Post-Dispatch

The director of the Center for Earthquake Studies at Southeast Missouri State University and an adviser to the state on earthquake policy says he believes in psychic phenomena.

David Stewart, director of the earthquake center, is the only seismologist to publicly support Iben Browning's prediction of a major quake in the New Madrid fault around Dec. 3.

Stewart said he did not believe Browning was a psychic. But in 1976, while a professor at the University of North Carolina in Chapel Hill, Stewart backed a psychic's prediction for a major earthquake near Wilmington, N.C.

Because of that position, he was denied tenure at the university.

In an interview Thursday, Stewart, 52, said his views had not changed since a 1976 faculty meeting when he said, "The psychic and the intuitive approach to scientific endeavor is both valid and valuable. Psychic phenomena is a fact."

Three-fourths of Stewart's salary is paid by Southeast Missouri State University and one-fourth by the State Emergency Management Agency.

Stewart's support of psychic phenomena puts him outside the mainstream of scientific thought and raises questions about the credibility of his support for Browning, several scientists said. The scientists also criticized what they believed was Stewart's extreme interest in publicly promoting Browning's prediction and method through the news media.

"I don't think a responsible scientist would do what he did" in supporting Browning, said David Dann, dean of the School of Natural Sciences and Mathematics at the University of Texas at Dallas.

Browning has forecast a 50-50 chance of a quake in the New Madrid fault within 48 hours of Dec. 3.

Also on Thursday, a national panel of earthquake experts said that the prediction was not scientifically valid and that Browning had not predicted any previous earthquakes or volcanoes, as he and his backers had claimed. Panel members with the National Earthquake Prediction Evaluation Council said further public concern about the Dec. 3 prediction was unwarranted.

Stewart, who was not on the panel, has been alone among scientists in

publicly suggesting that Browning's forecast has credence.

Dann, of the University of Texas, was a colleague of Stewart's in the geology department at North Carolina when Stewart brought in a psychic to investigate the possibility of an earthquake in the Wilmington area.

Stewart said that one day in the fall of 1975, while he stood in line at a supermarket, he saw a quake prediction for Hawaii in the National Enquirer by California psychic Clarissa Bernhardt.

Among other predictions Bernhardt has made in her career was that scientists would accidentally shoot down a UFO with a laser beam and John McEnroe would retire from tennis to play baseball for the San Francisco Giants.

Stewart said the Hawaii quake actually occurred, as did two others Bernhardt had predicted. Other scientists hotly disputed those claims, calling them unsubstantiated.

Stewart said he had found data indicating a possible earthquake in the Wilmington area, so he invited Bernhardt to North Carolina in December 1975. They flew and drove around the region, with Bernhardt advising him of her feelings about earthquakes at specific locations.

Bernhardt then issued a prediction that a quake measuring 8.0 on the Richter scale would strike the Wilmington area within a year, most likely within three days of Jan. 17, 1976. Such a quake would have been the largest in the history of the eastern United States.

"Since her first three [predictions] were good, we cannot ignore the possibility that her fourth may also be

“The psychic and the intuitive approach to scientific endeavor is both valid and valuable. Psychic phenomena is a fact.”

good," Stewart said at the time.

Insurance agents were swamped with calls for quake insurance. Some people made plans to leave town on that date and emergency preparedness officials warned them not to panic. The quake never happened.

Browning's prediction has caused similar reactions in Missouri, Illinois and other states where an earthquake in the New Madrid fault could be damaging.

"The parallels between the Wilmington prediction and this one with Browning are pretty striking," said one earthquake expert who asked not to be identified. "Both predictions are based on the flimsiest possible scientific evidence."

Arch Johnston, a seismologist at Memphis State University, said the Browning furor also is reminiscent of a scare in 1982 along the San Andreas fault in California. At that time, someone with no background in seismology predicted a quake would hit because of the alignment of celestial objects.

"I'm very concerned that we haven't learned our lessons from past episodes," Johnston said. Stewart was not connected with the San Andreas scare.

Stewart said that for scientists to bring up the Wilmington psychic prediction now is "character assassination. As far as I'm concerned, this Clarissa Bernhardt thing is ancient history."

Stewart said Browning's prediction is "a totally different ball of wax," appearing to have a scientific basis.

"He is going beyond the scientific method," Stewart said. "I just call it judgment."

Several scientists said Stewart was responsible for needlessly causing public anxiety by giving Browning's prediction undue credence in interviews with reporters and public speeches.

Stewart said he simply makes the point that any open-minded scientist should consider the possibility that Browning's method works because of Browning's record.

Stewart said he would have to study the national panel's report before commenting on whether it effectively rebutted Browning's claimed track record.

Stewart has been director of the Center for Earthquake Studies, at Cape Girardeau, since it opened in April 1988. He holds a doctorate in geophysics from the University of Missouri at Rolla.

He joined the North Carolina faculty in 1971. After he was denied tenure and given a grace period, Stewart left the university in 1978. He then ran a publishing company and became a best-selling author of books on natural childbirth and midwifery.

In 1988, he became the executive director of the Central United States Earthquake Consortium, a group of quake preparedness officials. Later that year he joined the Southeast Missouri State faculty.

- **October 21.** David Stewart defends Browning. Meanwhile, William Allen, science reporter for the *Post-Dispatch* has done further digging. He now reports that 15 years earlier Stewart lost his previous position at the University of North Carolina for inviting a psychic to speak on earthquake predictions and endorsing her approach as "valid and valuable."



Science

Wake Up, East And Midwest

The next Big One may not hit California after all

Springfieldians curious about earthquake insurance

By Mike Penprase
The News-Leader

Prompted by the 1989 San Francisco earthquake and predictions of a quake along the New Madrid

adding earthquake coverage to existing insurance is a relatively minor investment, said Richard Jackson, president of Barker Phillips Jackson Insurance Co.

experience showing frame homes sustain less damage than masonry homes in earthquakes, he said. Jackson said his firm has received 10 to 15 inquiries a day lately about



Quake drill, fears crack into bigtime network TV news

By Michael Lollar
The Commercial Appeal

Center for Earthquake Research and Information at Memphis State University, was inter-

Quake Concern Worries Residents Of Tiny Town

By William Allen
Of the Post-Dispatch Staff

TYRONZA, Ark. CONCERN ABOUT the possibility of an earthquake in December has risen to the level of panic among some residents here, says Mayor Ray Brewington.

"There's talk around here that some people are going to take their money out of the bank," Brewington said. The reason: Ben Browning's forecast of a 50-50 chance for an earthquake in the New Madrid Fault around Dec. 3.

Tyronza is a farming town of about 300 in northeastern Arkansas near the southern tip of the New Madrid Fault.

Brewington said he was urging people who are considering a withdrawal not to do so because they could be easy prey for thieves poised to take advantage of the panic.

Whether they withdraw from the bank or not, "the majority of people I've talked to say they're going to leave,"



comes. There's no need to panic." But quakes like a minor tremor

- **Mid-November.** The National Earthquake Information Service (part of the USGS) is fielding 100 calls a day related to the prediction. The St. Louis County emergency management office has been similarly swamped with inquiries.



<https://www.youtube.com/watch?v=uzM8SXqpsks>

- **Late November.** Country music singer Lou Hobbs releases his song, “Living on the New Madrid Fault Line”:

*Lately I feel a little nervous about my
section of the land of the free,
Living on the New Madrid fault line,
something’s shakin’, Lord, I hope it’s
just me.*

Over the next few days he is invited to sing it on *Good Morning America* and dozens of other television and radio shows.



- **December 3, 1990. Earthquake Day! New Madrid.** Some 200 reporters from around the world, and their vans with satellite antennae all parked in a cluster, are ready to report events as they happen. (The town's population is a mere 3,000.)

SCHOOL QUAKE CLOSINGS

Numerous schools in the region will close for up to a week in reaction to Iben Browning's earthquake projection.

Some school boards felt students just needed to be at home that day. Others closed anticipating high absenteeism. Some decided to shut down after polling the community. Schools closing are:

TENNESSEE:

Lake County, Monday
Lauderdale County, Monday
Dyersburg, Monday

MISSISSIPPI:

Cosahoma Junior College, Monday
First Presbyterian Kindergarten in Greenwood, Monday and Tuesday
Greene County, Monday
Tougaloo College, Jackson, Monday-Friday

ARKANSAS:

Cross County, Monday and Tuesday
Earle, Monday and Tuesday
East Arkansas Community College, Forrest City, Monday, Wednesday
East Foinsett, Monday and Tuesday
Forrest City schools, Monday, Wednesday
Hughes, Monday and Tuesday
Marked Tree, Monday and Tuesday

Marrell, Monday-Wednesday
Palestine-Wheatley, Monday-Wednesday

Paris, Monday and Tuesday
Scott, Mississippi County, Monday, Wednesday

West Memphis and all other Crittenden County schools except Marion, Monday and Tuesday

MISSOURI:

Cairwell, Monday and Tuesday
East Prairie, Monday and Tuesday

Gosnell, Monday
Kennett, Nov. 30 and Monday and Tuesday

Oak Ridge, Monday and Tuesday
Senath-Hornersville, Monday and Tuesday

KENTUCKY:

Daviess County, Monday and Tuesday
Hancock County, Monday and Tuesday

Hopkins County, Monday and Tuesday
Livingston County, Monday and Tuesday

McLean County, Monday and Tuesday
Muhlenberg County, Monday and Tuesday

Ohio County, Monday and Tuesday
Owensboro and Owensboro Catholic, Monday and Tuesday

Union County, Monday and Tuesday



Schools are closed here, and elsewhere — although the girl's volleyball game is going ahead, as scheduled. Residents have invested \$22 million in earthquake insurance.



The National Guard is continuing a sample “earthquake preparedness” drill nearby.

In town, you can buy your “I Survived the Earthquake” t-shirt, or a hamburger with a torn faultline across it.



People are gathered, chatting, and waiting. And waiting and partying. No earthquake.

The experts at the USGS were right, it turns out. All that hype for nothing.

▶ *How did Iben Browning's spurious claim spiral out of control? What factors fostered misleading beliefs?*

▶ *Who withheld judgment at first, or wanted to seek more information? Where might you have gone to seek a reliable scientific perspective (using today's technology, perhaps)?*

What should we learn from the episode of Iben Browning & the New Madrid Earthquake of 1990?

- about how misinformation spreads?
- about expertise and credentials?
- about reliable sources of information?
- about plausibility and expert consensus?
- about the role of scientific institutions?

- Iben Browning was not an **expert**. He did not have appropriate **credentials**. His claims were **presented outside the scientific literature**. Thus, they were not even worthy of being entertained by an ordinary (non-expert) citizen.
- Browning's claims may have seemed **plausible**, appealing to the cause and effect of physical forces. But **plausibility is not enough**. Significant claims, especially incredible ones, need to be vetted by other experts, and a **consensus** developed. Nor should one be cowed by jargon of complex concepts.

- David Stewart was consulted, in a journalistic tradition, as an “independent source.” But science demands more. Stewart’s own expertise mattered, too, and it had not been fully checked at first. Even when two isolated scientific experts may agree, however, ***the appropriate benchmark is the consensus of the relevant experts***—as reflected, here, in the views of the USGS.
- Browning’s earlier predictions—a factor in his alleged credibility—were unfounded. Yet at first, they were reported uncritically. Once traced, they proved to be without merit. Failure of due ***diligence in checking sources and second-hand claims*** can threaten effective science communication

- The coverage on national television was largely on informal “talk” shows. One should recognize that such programs seek to both inform and entertain. One should be wary if the programs have not explicitly fact-checked any extraordinary scientific claim. We should expect them to be ***subjected to (and survive) the scrutiny of alternate or critical expert assessment.***
- The USGS’s reluctance to overtly refute Browning’s claims at the very outset may be seen by some as a failure of public science communication. Yet their decision not to engage with pseudoscience was itself a potent indicator. When they did finally address the issue, their ***expert consensus*** (from a respected scientific institution, with a long and broad track record) should have been definitive for public policy

- The Precautionary Principle can be an effective policy tool in cases of uncertainty. However, in this case the **scientific consensus** was clear. Calling out the National Guard and closing schools was ill informed public policy, and may have contributed to fostering undue public anxiety and needless expense. Public agencies that distributed standard earthquake preparedness kits without disclaimers about Browning's illegitimate prediction implicitly gave credence to them, validating any unschooled sense of impending danger.
- The level of community concern was sustained largely by **hearsay**. It matters what people share with others. Individuals need to take personal responsibility in what they pass along.

- ***Fear*** was a significant factor. The claims played on an ***inflammatory emotion***. When such emotions swell, our discernment can falter. So one's demand for evidence should (counterintuitively, perhaps) be on high alert. One may well want to escalate the normal standards for justifying alarming conclusions.
- The ***commercial dimension*** might have been another clue. Sensationalism sells. But why should a citizen pay for a video on a matter of public safety? This was another indication that the messaging was occurring ***outside the realm of professional experts***.

- Ultimately (in retrospect), whose claims were *trustworthy*, whose were not, and why? How can this analysis inform our response in future episodes?

