

## Summary of Newspaper Articles

### Deseret News – Salt Lake City, UT (last date searched 08/19/1988)

Headline: [3 Quakes Stir Utah Geologists' Adrenalin](#)  
Date: 08/15/1988  
[Info Categories:](#) A, E, G, L, S

### Emery County Progress – Castle Dale, UT (last date searched 09/13/1988)

Headline: [5.6 Quake Jolts Emery County](#)  
Date: 08/16/1988  
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Headline: [Quake Info Wanted](#)  
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Headline: [Quake Shocks Felt](#)  
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Headline: [Earthquake Meeting Has Big Turnout](#)  
Date: 08/30/1988  
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### Salt Lake Tribune – Salt Lake City, UT (last date searched 08/25/1988)

Headline: [Three Earthquakes Rattle From Emery County](#)  
Date: 08/15/1988  
[Info Categories:](#) B, E, G, L, N, R

Headline: [Quake Trio Surprises Geologists](#)  
Date: 08/15/1988  
[Info Categories:](#) A, E, R, S

Headline: [Aftershocks Roll As Crews Comb Emery Area](#)  
Date: 08/16/1988  
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Headline: [Campers Near Quake's Epicenter Learn Lesson About 'The Puniness Of Man'](#)  
Date: 08/16/1988  
[Info Categories:](#) E, P

Headline: [Aftershock In Emery Rated 4.6](#)  
Date: 08/19/1988  
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## Information Categories

### **A -- Aid:**

provide medical services, shelter, donations, loans, advice, encouragement, implement safety measures

### **B -- Building Damage:**

structure itself plus windows and chimneys (typically damage visible from outside the building)

### **E -- Earthquake Description:**

where, when, duration, direction, sound, motion, number and timing of aftershocks

### **G -- Geologic Effects:**

changes at the Earth's surface, fault scarps, rockfalls, landslides, ground cracks, ground subsidence, sand boils, water spouts; effects on springs, lakes, wells

### **H -- Humor:**

### **I -- Impact:**

changes in daily routine; rumors; influx of reporters, politicians, cost in dollars

### **L -- Lifelines:**

effects on transportation: roads, bridges, railroads, airports

effects on communications: telephone, telegraph

effects on power, gas, water, and sewer lines

effects on dams

### **N -- Nonstructural Effects:**

effects on plaster, furnishings (typically damage or rearrangement of furnishings visible inside a building)

### **P -- People:**

effects on and responses to, during and after; deaths, injuries, near misses

### **R -- Recovery:**

clean up, rebuild

### **S -- Scientific:**

explanation of the day

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### 3 QUAKES STIR UTAH GEOLOGISTS' ADRENALIN

By Jerry Spangler

Residents of Emery County may still feel rather rattled. But geologists with the Utah Geological and Mineral Survey are rubbing their hands with glee at the rare opportunity to study the effects of three moderately sized earthquakes that rolled through Sunday afternoon.

No serious injuries or damage were reported.

State and federal geologists headed to Emery County Monday for field work on the effects of the quakes, the largest of which registered 5.6 on the Richter scale--the region's largest earthquake since a 1975 quake near Pocatello, Idaho.

"People shouldn't be spooked out of their minds by this," said state geologist Genevieve Atwood. People in Emery County should take time to learn about earthquakes so they can "look forward to the next one without a lot of anxiety."

Sunday's quakes were centered about 14 miles east of Ferron in the San Rafael Swell area. The first quake was recorded at 12:59 p.m. and registered a magnitude 3.5 on the Richter scale. It was followed at 1:08 p.m. by a stronger jolt measuring 4.3 magnitude and a third with a 5.6 magnitude at 2:03 p.m., said the U.S. Geological Survey's National Earthquake Information Center in Golden, Colo. The quakes were also registered by the seismograph center at the University of Utah.

None of the three earthquakes broke the earth's surface (a quake must usually register 6.0 to break the surface). Atwood said several minor shocks between the second and third quakes were recorded, though most passed unnoticed by Utah residents.

Atwood said residents in the area may be subjected to some aftershocks, but it's doubtful they will be very powerful. "They released an awful lot of energy," she said.

Geologists are particularly excited about the Emery County earthquakes because they occurred along "hidden faults" previously unknown to geologists. And they were strong enough to be felt as far away as Colorado and New Mexico, as well as in northern Utah. For years, geologists have studied the "bowl of Jell-O" syndrome of earthquakes--the idea that valleys take the brunt of the earthquake shaking, while the bedrock in the surrounding mountains acts as a bowl to reflect the quakes.

"The Emery quakes will give us a more sophisticated look at that idea," Atwood said.

Sunday's earthquakes were particularly felt in Utah's valleys, while they went less noticed in the mountain areas, Atwood said. "This quake may tell us how solid the bowl of Jell-O is in our valleys," Atwood said.

There were quite a lot of reports from Utah Valley and Park Meadows (Summit County) that may support the theory that valleys shake more than mountains.

Atwood admits Utah geologists don't know a whole lot about earthquakes along "hidden faults" in Eastern Utah. But they do know a lot about faults along the Wasatch Front.

"If you look at the historical earthquakes in Utah of 4.0 or greater, most of them go right down the center of the state with a few stray ones (six) in the eastern part of the state," she said. "Those occurred on faults we didn't recognize."

Officials from the state Division of Water Rights and the federal Bureau of Reclamation were dispatched to the region Monday to check the structural safety of various reservoirs. Geologist William Case was also in Emery County Monday studying rock falls. "We got a lot of ground shaking with this quake," said Atwood, "and that resulted in a lot of rock fall. We want to get a sense of which rocks fell and how far they rolled. We also want to take a look at which rocks didn't dislodge and why."

Rock falls in some areas blocked roads Sunday but caused no damage to roads or property.

The Emery County earthquakes should teach Utahns a valuable lesson, said Atwood. Just because you don't live along the Wasatch Front doesn't mean you won't be subjected to strong earth tremors.

Still, state geologists will continue to focus the lion's share of their attention of the Wasatch Front faults where "a whopper" of an earthquake is expected in the next 50 to 100 years.

"It's enough to scare us to death," Atwood said.

**[Deseret News; August 15, 1988]**

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## 5.6 QUAKE JOLTS EMERY COUNTY

By Larry W. Davis

Federal, state and local officials are still assessing the damages of the earthquake which began in Emery County and rippled throughout Utah and surrounding states on Sunday, Aug. 14.

The largest of three earthquakes was registered on the Richter scale at the University of Utah at 5.6 and occurred at 2:03 p.m. The Emery County Sheriff's Department said that the epicenter of the quake was 10 miles east of Ferron and 30 miles south of Price on the Emery County eastern desert.

Dispatcher John Burdick said that reports from the University of Utah noted that there were two foreshocks before the 2:03 p.m. quake. The first came at 12:58 p.m. and measured 3.5 on the scale while the second came at 1:07 and measured 4.3. The largest of the three quakes lasted from 10 to 15 seconds.

Sheriff Lamar Guymon said that as of Sunday evening, there were no reports of extensive damage although some foundations, chimneys and old buildings in Emery County were cracked and broken.

The sheriff said that there were no calls for medical treatment and no ambulances were dispatched following the earthquakes. However, he said that the quakes caused several rock slides in steep canyons and that one lane of traffic was covered by a slide in Huntington Canyon near Little Bear Campground.

Guymon said that calls came to the sheriff's office from each of the area coal mines after the earthquake and no significant damage or personal injury were reported. Also, the power plants continued to operate although there was a brief shutdown just after the earthquakes as part of each plant's built-in safety mechanisms.

The sheriff said that deputies checked the dam at Electric Lake after a report indicated that the structure may have been damaged by the earthquake, but he said a visual inspection indicated that the dam was sound. Also, other dams in the area were reported to be stable. The power in Emery County remained on during and after the earthquake, but the sheriff said there were reports of minor damage to personal property throughout the county, including merchandise in stores being dumped onto the floors, ceilings and walls cracking and damage to plaster, pictures being jolted off walls, dishes broken and cement cracking. Ira Hatch, Price District ranger of the Manti-LaSal National Forest, said Monday that sites within the forest had received no appreciable damage although there are several areas where rocks have rolled off mountain-sides.

Hatch said Huntington Canyon was closed briefly due to a slide and that a boundary fence was damaged by another slide. The dam at Electric Lake, as reported by the sheriff's office, is sound, but Hatch said engineers will arrive later this week for a more in-depth inspection.

"I've inspected all of the waters in the area, and they are clear. That tells us that there is no major blockage at higher elevations," Hatch said. "It appears that the further up you go, the less damage there is. All of the roads are now clear."

Hatch also said that reports from the Ferron Ranger District to the south indicate that there was a rock slide in Ferron Canyon, but that has been cleared and no other major problems have been discovered.

The Forest Service official added that the earthquakes loosened much of the dirt pack on steep mountain-sides in the forest and that slides could continue although Hatch said there will likely be more of a problem in the spring than there is at the present time.

The 5.6 earthquake was the largest registered in Utah since 1975 when a 6.1 quake was recorded along the Utah-Idaho border.

Sunday's quakes came while many in Emery County were attending church. The largest quake left residents scampering for spots safe from falling debris. As the quake rumbled through, clouds of dust could be seen on the desert and in canyons to the west while light poles swayed and the pavement rolled.

**[Emery County Progress; August 16, 1988]**

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## QUAKE INFO WANTED

People in the Carbon-Emery area with information about the recent earthquake are asked to contact the Utah Geological and Mineral Survey.

"We are really concerned about rock slides and other types of damage that might have occurred during the earthquake that centered north of Ferron," Dottie Brockbank, public affairs officer, said.

"Those who saw rock slides or other damage are asked to call 581-6831 and ask for Chris," she said. Or they can write the information and send it to UGMS, 606 Black Hawk Way, Salt Lake City, Ut. 84108-1280. "We are anxious to get some things in writing," she said.

A great deal of valuable information can be gained if people who witnessed or have knowledge of rock slides or other damage will respond, she said.

The information should include the location and time the slide or other event occurred.

**[Emery County Progress; August 16, 1988]**

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## QUAKE SHOCKS FELT

By Larry W. Davis

A series of aftershocks has kept residents of Emery County mindful of the 5.6 earthquake which hit the area Sunday, Aug. 14.

The largest aftershock recorded since the 5.6 reading came on Thursday at 6:44 a.m. when the Richter scale at the University of Utah measured the quake at 4.6. The epicenter of the aftershock was at the same eastern desert location as the ones recorded Aug. 14. Meanwhile, government agencies have been evaluating the recent earthquakes although no significant damage has been reported.

Emery County School District board members discussed the quake at the board meeting Aug. 17. Superintendent A. Ernest Weeks said that only minor damage has been found in the schools although a few gas leaks have been detected.

The board expressed concern that training be given to students as to the proper way to deal with an earthquake during the school day. The superintendent said that teachers will be instructed and drills will be held in the schools this fall.

The Utah Division of Comprehensive Emergency Management has announced that it will conduct a discussion on the recent earthquake activity in the Emery County area at a meeting in the Emery County Courthouse on Thursday, Aug. 25 at 7 p.m.

Fred E. May of that office said that objectives of the meeting are to instruct interested residents in the causes of northern Utah earthquakes, to advise them in earthquake preparedness, and to gather information on the impact of the local earthquake.

Speaking at the meeting will be Lorayne Frank, director; Mr. May, state hazard mitigation planner; James Tingey, state earthquake preparedness planner; and Bill Damery, state geophysical programs planner.

May will present a discussion on local geology and the causes of earthquakes in northern Utah while Mr. Tingey will present information on earthquake preparedness for families, schools and businesses. Mr. Damery will present an earthquake impact survey, gathering information from area residents on the main earthquake shock and aftershocks and on resulting impact.

Although everyone is invited, people who experienced property damage or who had "interesting experiences" from the earthquake are especially encouraged to attend.

The Utah Geological and Mineral Survey (UGMS) is also following up the earthquakes and would like help from people who witnessed rockfalls or evidence of rockfalls during or after the earthquakes. UGMS geologists seek basic information such as where and when the rockfalls were seen, how large they were, and if they caused any damage.

"It is important to know the total area that experienced rockfalls in order to predict future rockfall hazards if a similar earthquake should occur in a different location," said UGMS geologist Bill Case. "Knowing the magnitude and time of events is helpful in determining the minimum threshold of shaking needed to produce rockfalls. We must know the location of the rockfall so we can investigate, and the size of the rockfall to determine if an investigation is necessary."

Geologists also point out that dust is often the only visible indication of a rockfall, so it is important to report when and where dust was seen; particularly if it was observed along a cliff near the time of the earthquakes.

The Utah Geological and Mineral Survey has a questionnaire they would like completed. To request a questionnaire, please call Chris Wilkerson at 581-6831 or write to the Utah Geological and Mineral Survey, 606 Black Hawk Way, Salt Lake City, Utah 84108-1208.

The Emery County Progress would also like to print earthquake stories. If you have any, let us know.

**[Emery County Progress; August 23, 1988]**

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## EARTHQUAKE MEETING HAS BIG TURNOUT

By Larry W. Davis

The aftershocks may have died down from the Sunday, Aug. 14 Emery County earthquake, but the interest is still very much alive as nearly 100 local residents attended an earthquake informational meeting at the courthouse last week.

Sponsored by the Utah Division of Comprehensive Emergency Management (CEM), the meeting was held Aug. 25 to receive input from area residents in regards to their personal experiences with the 5.6 earthquake and its aftershocks and to offer some information about that quake and earthquakes in general.

Jim Tingey, a state earthquake preparedness planner, told the group that if the Emery earthquake had occurred in a large city, the damage would have been extensive. He said that a quake registering 5.4 on the Richter scale in El Salvador killed 1,500 people.

However, he also noted that earthquakes registering from 5.0 to 5.9 on the scale are quite common, with thousands occurring around the world each year.

Using a slide presentation, he illustrated that earthquakes are measured according to risk from one to four, with four being the area of greatest severity. California has a rating of four while much of Utah is in the two to three range. Most of the western United States is ranked high while only isolated areas in the east show rankings at all.

According to Mr. Tingey, the Emery quake, which is officially being called the Ferron Earthquake, was felt in Salt Lake County and into Box Eder County because of the long, slow vibrations it caused. He said that the movement hundreds of miles from the epicenter was due to the soils reacting to the vibrations.

The swaying of tall buildings is often associated with the liquidity of the underlying soils, he said, and referred to the disastrous earthquake in Mexico City in September of 1985. Several tall buildings were destroyed although the epicenter of the earthquake was 200 miles from that city.

Saying that earthquakes cause the floors and walls of buildings to separate, Mr. Tingey suggested that the safest place to be in a building is away from the walls. He said older brick homes are more at risk in an earthquake than are small wooden frame homes.

A report that a "swarm" of small earthquakes preceded the major quake in Emery County came as a surprise to many present although rumors have circulated regarding that subject. Mr. Tingey said that over 100 small quakes since the first of the year have been recorded, but generally unfelt, in the Emery County area. However, he said that the big quake was recorded as being further south of the epicenter of the "swarm" quakes.

He also said that there is no way of telling whether the swarm had any connection with the Aug. 14 earthquakes, but he suggested that aftershocks from that earthquake could continue for years.

He advised residents that the best way to be prepared for an earthquake is to have a kit on hand containing a flashlight, first aid kit, fire extinguisher, snack food and battery-operated radio. The so-called 72-hour survival kit is not necessary.

When asked about the dangers of having several reservoirs above the populated areas in the valley, Tingey said that the Joe's Valley dam is a concern because of its "inundation area" or the area which would be flooded should it break. He said that the Bureau of Reclamation, which is responsible for that dam, would have to simulate dam collapse to determine how long it would take for water in the reservoir to reach the valley.

He said that while there is an active fault near the dam, the Bureau of Reclamation has an excellent record for dam stability.

Turning to other earthquake procedures, Mr. Tingey said that following a quake, residents should turn off water valves and electrical systems but that gas should be left alone unless it is leaking and it is known how to shut the gas off. Also, he said that most gas leaks are caused from water heaters being shaken from the pipes. He suggested anchoring them down.

Fred May, a state hazard mitigation planner, explained how earthquakes occur. He called the world a giant jigsaw puzzle made up of huge slabs of land mass. Often these slabs move into each other, causing an earthquake. Heat and movement within the earth cause the slabs to move.

One area of greatest activity is along the West Coast where the land mass slab is moving against another slab under the ocean. The faults in California extend north in Nevada, Utah, Idaho and Montana and account for the earthquakes in these mountain states.

Dr. May said that the earthquake on the San Rafael Swell was a combination of a vertical and lateral-type slippage and that activity was recorded at deep as 20 miles down.

While little damage was done by the 5.6 earthquake, Dr. May said that quakes of even greater magnitude would do little damage in the rural areas. He offered information about a recent earthquake in central Idaho which measured 7.3 and the epicenter was near the small communities of Challis and Stanley.

Although two school children were killed by falling brick as they walked to school, Dr. May said that only the taller, older buildings were damaged. "I expected total devastation," he said. "We found that the damage was not astounding."

From his research on that earthquake, Dr. May said a similar earthquake in Emery County could be more destructive to larger populated areas many miles away. However, Emery County would see damage to some buildings, roads, canal systems, water systems and utilities.

A look at the information compiled by the University of Utah shows that the epicenter of the earthquake of Aug. 14 was 15 miles south and east of Castle Dale. At the meeting, the exact location was narrowed to a location near Fuller's Bottom. Instruments have been installed to measure continuing activity.

Dr. May said that Emery County is full of faults, but most are located to the west of the valley. The faults on the desert are different. He even suggested that the recent earthquakes may not even be the result of fault movement but something else taking place within the earth. "What's down there may be more complex than what we think," he said.

Also at the meeting, those present were asked to fill out information sheets to help the CEM evaluate the Ferron earthquake and use that information for earthquake studies and preparation.

**[Emery County Progress; August 30, 1988]**

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## THREE EARTHQUAKES RATTLE FROM EMERY COUNTY

By Mike Gorrell

Much of Utah and parts of two neighboring states were shook Sunday by the largest of three moderate earthquakes in Emery County, but no injuries and minimal property damage resulted.

The epicenter of the quakes, the largest of which occurred at 2:03 p.m. MDT and measured 5.6 on the Richter scale, was 30 miles south of Price and 14 miles east of Ferron, Emery County, on the fringe of the San Rafael Swell. The earth movement was felt clearly by many Salt Lake residents, and also was evident as far away as Golden, Colo. and Albuquerque, N. M., said Bruce Presgrave, a geophysicist with the National Earthquake Information Center in Golden.

The activity began at 12:59 p.m. with a quake of magnitude 3.5. Five minutes later, the scale registered a 4.0 tremor. Major movement ceased until the 2:03 p.m. quake, the largest in 13 years in what's classified by the University of Utah Seismograph Stations as the "Utah region."

The region extends just north of the Utah-Idaho border to include the Pocatello Valley, where a quake of magnitude 6.1 occurred in 1975. (The U. of U. measured Sunday's largest quake at 5.4, a disparity which officials said was not unusual due to different equipment).

Sheriff's dispatchers in Emery and Carbon counties said Sunday's largest quake damaged a driveway and a home's foundation in the Middle Creek area between Price and Wellington, cracked part of a building at Joes Valley Reservoir, knocked goods off grocery store counters in Orangeville, Emery County, and caused pictures and mirrors to fall off wall hooks in many homes.

The temblors also unleashed numerous rock falls along the coal-rich ridge that runs north to south through Emery County. Fallen boulders temporarily disrupted the traffic flow through Huntington Canyon, but they were removed within hours.

In Lockhart Basin just outside of Canyonlands National Park, sheets of rock were dislodged from a 1-mile section of a steep cliff. The material stopped before reaching a four-wheel drive road below, said Allyson Mathis at the park's Needles station.

Initial observations indicated the quakes did not damage any of the numerous reservoirs in the mountains west of the epicenter, but more detailed examinations will be conducted this week to verify that sub-surface cracks did not develop, said federal Bureau of Reclamation spokesman Barry Wirth.

Utah Power & Light Co. spokesman David Mead said the movement caused generators to trip at the company's Huntington and Hunter power plants, but no outages resulted. Nor did the quakes damage UP&L's coal mines (Wilberg/Cottonwood and Deer Creek) or the Electric Lake dam, which provides water to the Huntington power plant.

Julie Shemeta, a U. of U. seismology graduate student, said seven quakes of magnitude 2.5 or less were recorded near the epicenter during January; nothing significant has happened since then. Mr. Presgrave said little is known about the area's fault structure, but records do not reveal much seismic activity.

"There's no big ones that we know of. A quake of that size [5.6] is pretty good for that area," he added.

Bob Riley, mayor of Clawson, Emery County, just miles from the epicenter, was eating dinner when his house started shaking and materials started falling off walls and shelves.

His family ran outside and he saw that rock falls on the western ridge had created clouds of dust that partially obscured Ferron Mountain and the cliffs around the Wilberg Mine. "You couldn't see the mountain up around Wilberg for five to 10 minutes because of the dust. Same on the desert [to the east]. Just a big string of dust from as far south to as far north as you could see," he said.

Castle Dale Mayor Don Jorgensen said he saw the large cloud of dust from a rock slide near the Wilberg Mine just as he came out of services at the Castle Dale Stake center of the Church of Jesus Christ of Latter-day Saints. He observed no damage to public or private structures while driving around town later.

Orangeville Mayor Tom Humphrey said he thought the quake may have slightly damaged his town's LDS ward house, but did not undermine the city's water treatment plant or water lines.

It did, however, ruin a keepsake for Orangeville resident Cindy Green--a "ship-in-a-bottle" finished recently by her grandmother fell off a shelf and shattered.

Farther north in Helper, Carbon County, the movement also unnerved Clara Maddox. She was in her kitchen reading a book when the largest quake hit. She quickly went outside, fearing the movement would collapse her home, built in 1929 primarily of plaster.

**[Salt Lake Tribune; August 15, 1988]**

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## **QUAKE TRIO SURPRISES GEOLOGISTS 'Hidden Fault' Came To Life, Say Experts**

By Christopher Smart

The trio of earthquakes Sunday, originating in Emery County, took geologists somewhat by surprise because there are no major faults in the area near the San Rafael Swell.

Utah State Geologist Genevieve Atwood said the quakes, centered 14 miles east of Ferron, were from a "hidden fault" not noticeable on the earth's surface.

Although small tremors had been recorded in Emery County during the past month, the quakes occurred "in an area east of where we expect earthquakes to be . . . There aren't a lot of faults out there," Ms. Atwood said. And the quakes were not large enough to rupture the earth's surface.

The largest and last of the three temblors occurred at 2:03 p.m. and registered 5.6 on the Richter scale. But the geologist explained that the earth's surface usually does not rupture until quakes reach a magnitude of 6.0 or greater.

Most of Utah's earthquake analysis and study is centered along the 10 segments of the Wasatch Fault, which runs from Brigham City to Nephi. Geologists are studying the Wasatch Fault intensely because of its earthquake potential and danger to residents, Ms. Atwood noted.

She compared a potential Wasatch Fault earthquake with Sunday's tremors: "This is nothing compared to what would happen if any of the 10 segments of the Wasatch Fault were to rupture."

"Utah is earthquake country," Ms. Atwood said. She added that while geologists are beginning to understand the Wasatch Fault, other areas of potential earthquake activity, such as Emery County, are less understood.

"We're getting a much better handle on the earthquake hazard on the Wasatch Front but not necessarily the rest of Utah."

Sunday's quakes should serve as a warning for those who do not live along the Wasatch Fault. "The idea that in this area [Emery County] of the state you can expect earthquake activity not on a defined fault is of concern . . . and you have to design facilities accordingly," she said.

The three quakes were felt as far away as Brigham City to the north, Delta to the west and in Colorado and New Mexico. Geologists are attempting to learn more about ground shaking to be able to minimize earthquake damage, Ms. Atwood said. Sunday's quakes will aid that endeavor throughout the state.

"There really is a difference between surface rupture and ground shaking. The ground shaking is much more widespread."

Monday, geologists will begin studying the Emery County earthquake site to determine, among other things, if present facilities are located in dangerous areas, and for any rupture in the earth's surface. They also will identify areas prone to rock slides from earthquakes. And geologists will analyze wells to determine if the quake affected the hydrology of the area.

**[Salt Lake Tribune; August 15, 1988]**

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## AFTERSHOCKS ROLL AS CREWS COMB EMERY AREA

By Mike Gorrell

Minor aftershocks emanated from the vicinity of Sunday's earthquakes in Emery County as scientists began searching Monday for evidence about the previously unknown fault under the San Rafael Swell.

Linda Hall, a seismic analyst at the University of Utah Seismograph Stations, said nine aftershocks had been recorded by late Monday afternoon. The largest, 3.1 on the Richter scale, occurred at 8:50 a.m. Monday, while another of magnitude 2.7 was registered two hours later.

They were the largest aftershocks of an earthquake measuring 5.5 that rocked Emery County at 2:03 p.m. Sunday. That tremor was felt throughout much of Utah and in Colorado and New Mexico. The sequence of 16 quakes also included jolts of magnitude 4 and 3.5.

The moderate earthquakes caused no injuries and apparently did not damage any structures, although inspections of dams in the mountains west of the epicenter will continue for much of the week.

The main impact seems to have been numerous rock slides and the peaking of human interest.

Noted Emery County Sheriff Lamar Guymon: "A lot of people are still scared, but everybody needs to understand these things are going to happen. You just have to prepare yourself and stay as calm as you can. Of course, that's a lot easier said than done."

The U. of U. dispatched two seismology graduate students to the area of the epicenter, about 30 miles south of Price and 14 miles east of Ferron, Emery County. The students and a geophysicist from Snow College set up portable instruments to pinpoint the location of aftershocks more precisely, said university seismologist Jim Pechmann.

The state Division of Comprehensive Emergency Management and Utah Geological and Mineral Survey also sent geologists "to go through the whole area and see what evidence they could find," said CEM director Lorraine Frank.

UGMS geologist Bill Case will focus on rock falls generated by the quake, said spokeswoman Dotti Brockbank.

Mr. Pechmann said he felt the sequence of tremors was fairly typical--"although I hate to say typical because earthquakes are never typical"--and that he was interested in the location of the seismic activity.

"It was a fairly unusual location for an earthquake, but I wouldn't go so far as to say it was unexpected because one can expect moderate earthquakes to occur anywhere along the Wasatch Front, even in places where there are no faults mapped at the surface," he said.

"Smaller earthquakes that do not break the surface can occur on varied faults that we don't necessarily see at the surface, or perhaps haven't seen yet," he added.

Mr. Pechmann also noted that "a lot of Utah hasn't been mapped carefully. Doing detailed maps is a very time-consuming process."

Meanwhile, state and county officials received no reports of significant structural damage. Nor did the quakes harm utility lines or any of the area's numerous coal mines.

Ms. Frank said the state engineer flew over numerous irrigation dams Sunday and observed no evidence of damage. Utah Department of Transportation inspections revealed that all roads and bridges were intact.

"It looks like it just jolted a lot of people, enough to get their attention," she added. "But what would have happened if it had been in Salt Lake?"

When Sunday's largest quake struck, coal mines had only a limited workforce on hand. Mining companies reported no problems to the federal Mine Safety and Health Administration, whose inspectors carried out their regular duties Monday, said subdistrict manager Lamar Bishop.

The quakes also did not damage natural gas transmission lines that traverse the area or serve local customers, said Mountain Fuel Supply Co. spokeswoman Susan Glasmann.

**[Salt Lake Tribune; August 16, 1988]**

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## **CAMPERS NEAR QUAKE'S EPICENTER LEARN LESSON ABOUT 'THE PUNINESS OF MAN'**

By Mike Gorrell

Paul Narveson feels doubly fortunate after apparently being near the epicenter when the largest of Sunday's earthquakes occurred.

Lucky, because he and a friend weren't hurt. Privileged, because not many people see nature in action like they did. And in a spectacular location like the San Rafael Swell.

"What a lesson about the omnipotence of nature and the puniness of man," said Mr. Narveson, a 53-year-old cab driver from Salt Lake City.

He was on a weekend camping trip with Dave Lindbloom, a social worker from Spring City, Sanpete County. They spent Saturday night at the San Rafael Bridge Campground, then explored the surrounding countryside Sunday morning before returning to camp about 1:30 to eat a leisurely lunch.

It was a beautiful day, Mr. Narveson said. The castle-like red and yellow rock formations around the camp stood out against a clear blue sky. It wasn't overwhelmingly hot. No one else was around.

Then it happened.

"We were just relaxing when we heard this ungodly noise. It sounded mainly underground, like a huge herd of underground elevated trains, freight trains coming at us from the west," he recalled.

For the next 20 to 30 seconds, Mr. Narveson maintained, the pinnacles of rock "started to dance," primarily up and down but also side to side. "I swear they were lifted 3 to 4 feet and settled back down. It was like some giant hand was lifting them up, like they were puppets on a string.

"We were barely able to stand up when the shock wave went under," he continued. "I especially watched the red rock cliff nearest to us. I was sure that with it going up and down and shaking side to side it would break apart and we'd be buried under it . . . we saw whole mountains dancing. The damn things, all of them did it."

To the campers' surprise, however, the rock formations didn't crumble. "Despite all the violent action in the dancing motion they went through . . . almost no rocks fell off of them. It was amazing," Mr. Narveson said.

What happened after the earth stopped moving was equally astounding, he said.

"After the cliffs settled down for the last time, all of them became smoking chimneys of dust. It was like pictures during World War II of smoke coming out a city that was being bombed. The dust [came out] like you took a blanket and shook it."

About then, the men figured they'd better skedaddle. If they weren't bashed by falling rocks, they could suffocate in the settling dust. Or, who knows, with that much display of force, a tidal wave could rush down the San Rafael River and drown them.

"We left immediately. We stopped being scared and just got the hell out of there," Mr. Narveson related. "Who knew what was happening. We didn't want to be buried under rocks like up at Hebgen [an earthquake early in the 1960s caused a mountainside to collapse outside of Yellowstone National Park, burying a campground and damming the Madison River to form Quake Lake]. We didn't know whether another shock might be coming."

Originally they had planned to drive from the campground to Castle Dale, but that was through narrow canyons. Too dangerous, Mr. Narveson said. It would be safer to drive south through more open country to Interstate 70.

"We got halfway back and looked back at the whole fairyland of red rock . . . it was a real testimony to the might and force of nature," he said, noting that they thought new fissures had formed in rock formations they'd explored earlier.

Mr. Narveson was impressed. "We were lucky to be in place to witness it and not get hurt by it. And privileged to witness just an incredible sight."

**[Salt Lake Tribune; August 16, 1988]**

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## **AFTERSHOCK IN EMERY RATED 4.6**

Central Utah was shaken by another moderate earthquake Thursday morning. An aftershock of magnitude 4.6 on the Richter scale emanated from the area of three moderate earthquakes Sunday in Emery County's San Rafael Swell, said Linda Hall, a seismic analyst at the University of Utah Seismograph Stations.

The 6:44 a.m. tremor was the largest aftershock following the main quake, which was measured at magnitude 5.4 at the university and 5.6 at the U. S. Geological Survey's National Earthquake Information Center in Golden, Colo.

Aftershocks with magnitudes less than 1.5 were recorded later in the morning, Ms. Hall said, increasing the number of tremors in the sequence to 27.

Thursday's largest aftershock was felt at Scofield Reservoir and in Grand Junction, Colo., but no damage was reported.

**[Salt Lake Tribune; August 19, 1988]**

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