

EARTHQUAKES RATTLE AFTON AREA

Shaken Residents Report No Significant Damage

Two earthquakes near the Idaho-Wyoming border shook portions of four states early today in what seismologists believe was the apparent culmination of an earthquake swarm under way for a week.

Though no damage was immediately reported in eastern Idaho, mild shocks were felt in Swan Valley, Pocatello, Jackson, Wyo., and Salt Lake City.

The two quakes occurred in a remote area of the Caribou National Forest, about 25 miles east-northeast of Soda Springs and 10 miles northwest of Afton, Wyo. Seismologists in Utah and Colorado said the possibility of stronger quakes still occurring during the swarm was small but could not be ruled out.

A swarm is a series of earthquakes with no distinctive main shock. A normal earthquake sequence has foreshocks, a main shock and aftershocks. The main shock by definition is the largest of the sequence, said Sue Nava, senior staff seismologist with the University of Utah Seismograph Stations.

The second quake, measuring 5.5 magnitude on the Richter scale was felt in Grand Junction, Colo., about 300 miles from the epicenter. That quake occurred about 2:06 a.m., said Bill Schmieder, a geophysicist with the National Earthquake Information Center in Golden, Colo.

A quake of 4.5 magnitude occurred about 12:15 a.m. in the same area, he said.

Dispatchers in Bonneville, Teton and Caribou counties said they had not received any reports of injury or damage.

"It was just enough to wake people up. It was pretty gentle," said Judy Long, a Caribou County dispatcher in Soda Springs, which has about 3,100 people.

Afton authorities reported some minor damage.

"We really felt them," Joan Putnam, a Lincoln County dispatcher in Afton, said. "We've had reports of stuff falling off walls, but nobody has been injured."

Jim Gallagher, manager of the 7-Eleven store in Afton, also said he had heard of no major damage from the earthquake.

"It broke a few dishes," he said. "We're in pretty good shape."

In Swan Valley, Dwight Yonts, operations supervisor at the Palisades Dam for the Bureau of Reclamation, said he'd received several calls this morning from concerned residents, though he hadn't heard any reports of damage.

"A preliminary investigation shows no damage at all (to the dam)," he said. "We don't anticipate any."

Yonts said the "only thing I felt was the phone ringing." It was a long morning for Yonts, who had to make two inspections of the dam.

"We just got through with the first one when the second one hit, so we had to do it all over again," he said. "It's part of the job."

Other Swan Valley residents reported pets felt the quake more than they did.

Barbara Davidson, of Irwin, said she would have slept through the quake had it not been for her canary. "She was just a chirping and raising all kinds of cain," she said. "I think the animals are more sensitive than we are."

Rayna Traughber, of Swan Valley, said her pot-bellied pig awoke her and her husband, and other residents she had talked to said their dogs and cats were acting up.

Trish Gorman, a dispatcher for the Teton County Sheriff's Department in Jackson said the office had received several calls from people asking about the quake. Some reported feeling slight shaking in their homes, but again no damage has been reported.

"I felt it. It woke me up," Gorman said. "The house creaked and the bed shook. But I'm from California, so I'm used to it."

Earthquakes are common to the north of Afton in the Yellowstone National Park area and seismologists have said the Jackson Hole area is overdue for a major earthquake.

But Jim Case, head of the Hazard Section for the Wyoming Geologic Survey, said it is impossible to determine when a similar event might occur.

"The best we can do from a geological standpoint is say there are certain kinds of events we expect as maximum events," he said. "For example, there are some (earthquakes in the) magnitude of 7.5 in the Western part of the state that can occur and have occurred in the geologic record. But we don't know exactly when that kind of event will occur in the future. It probably will, but we don't know when."

Waverly Person, a geophysicist with the earthquake center at Golden, said the swarm, or cluster, of earthquakes began with a 3.2 quake on Jan. 30.

Arabasz said there was a 3.9 quake Tuesday and a 4.3 quake at 4:04 a.m. Wednesday.

"I would say that the 5.5 earthquake would be the

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main shock of this series," Person said.

The area of highest earthquake activity in eastern Idaho is known as the Intermountain Seismic Belt. The zone encompasses an area from Utah's Wasatch Front north to Jackson and includes Malad, Preston, Soda Springs and Gray's Lake.

While tremors in this area can sometimes be felt in Blackfoot, Idaho Falls and Pocatello, it's unlikely they

will cause major damage in those towns, said Paul Link, a geology professor at Idaho State University. No major fault underlies the Snake River Plain.

Link said it's just as likely residents of Idaho Falls will feel tremors from quakes in the Lemhi or Lost River valleys, or the Hebgen Lake area of Montana.

[Post Register; February 3, 1994]

TEMBLOR ROCKS AND ROLLS THROUGH UTAH'S GEOLOGY

By Lee Siegel

A strong earthquake in Idaho shook a wide area of northern Utah because energy was carried through solid rock in mountain ranges, then amplified by loose sediments under Wasatch Front valleys.

The quake at 2:05 a.m. Thursday measured magnitude 5.5 to 5.9, depending on the scale used, but caused only one reported injury and light damage. University of Utah seismologists warned there was a 5 percent to 6 percent chance of a stronger jolt within a few days.

The tremor caused surprisingly strong rattling in Salt Lake City, 135 miles southwest of the epicenter. It was felt in a wide area of Idaho and Wyoming, as far south as Moab, and even in Grand Junction, Colo., 300 miles from the epicenter.

A hefty aftershock measuring 5.2 also was felt in Salt Lake city at 7:42 p.m. Thursday.

Scientists said the widespread rumbling in Utah provides more evidence that disastrous shaking will result when a much stronger quake someday ruptures Utah's Wasatch Fault, which passes under the state's biggest cities.

"Think about this being 1,000 times bigger and 100 miles closer," said M. Lee Allison, director of the Utah Geological Survey. "The impact on this state and metropolitan area is going to be devastating unless we really start working harder to prepare for it."

The quake set off numerous burglar alarms in the Salt Lake Valley, prompted all Salt Lake City fire stations to go on alert, caused one false report of building damage, and overwhelmed the Salt Lake City Dispatch Center with calls from concerned residents, said city Fire Marshal Ren Egbert.

"If there had been calls reporting damage or injuries, they would have had a hard time getting through because of the calls seeking information," Egbert said. He urged citizens to call 911 only to report emergencies, not to get information.

The jolt was centered in a remote area near Idaho's Webster Range and Star Valley, and happened on a known fault that last ruptured about 4,500 years ago, the U. S. Geological Survey (USGS) said.

The epicenter was 24 miles east-northeast of Soda Springs, Idaho, and 12 miles west of Afton, Wyo., and was part of a swarm of smaller quakes that started Sunday, said Walter J. Arabasz, director of the University of Utah Seismograph Stations.

The only reported injury was a Wyoming resident

hit on the head by a falling flower pot, according to The Associated Press.

The USGS reported some cracked foundations and plaster walls and other minor to moderate damage in the epicentral area. Afton-area residents also reported some broken windows, dishes and glasses falling from shelves, and mirrors being thrown from walls.

One home reportedly was knocked off its foundation in Auburn, Wyo., but that could not be confirmed, said Jim Pechmann, a seismologist at the U.

The U. said the swarm that started Sunday included a foreshock measuring 4.5 to 5.0 at 12:15 a.m. Thursday.

By 4 p.m. Thursday, 30 aftershocks measuring 3.5 or stronger had been recorded, the U. said.

The USGS said the activity was unrelated to recent quakes in Oregon or the magnitude 6.6 quake that killed five dozen people in Los Angeles on Jan 17.

Arabasz said he was surprised that so many people in the Salt Lake Valley felt the Idaho quake. Two factors explain why:

- Ancient solid rock in the Bear River and Wasatch ranges apparently served as a conduit for the quakes's seismic waves, so "the decrease of energy with distance may have been less than usual along this path," Arabasz said.

- Pechmann said that once the seismic waves reached the Salt Lake Valley and other Wasatch Front valleys, they were amplified by soft sediments, mainly sand and gravel.

"The waves get trapped within the basin and bounce around because there is a very strong reflector of seismic waves" where soft valley sediments meet underlying harder rock, Pechmann said.

The quake's epicenter was located in the Intermountain Seismic Belt, which stretches from southern Nevada, up through Utah's Wasatch Fault and into Idaho, Wyoming and Montana.

The Intermountain Seismic Belt is the second most seismically active region in the contiguous United States, after California. It produced Montana's 7.5 Hebgen Lake quake that killed 28 people in 1959, and the 7.3 Borah Peak, Idaho, quake that claimed two lives in 1983.

Scientists say quakes measuring 7 to 7.7 in magnitude rocked Utah's Wasatch Fault roughly every 400 years in prehistoric times, but Utahns are not fully aware of the danger because there have been no devastating jolts since settlers arrived.

Nevertheless, researchers believe such a quake is inevitable, and will be catastrophic because of the large number of unreinforced brick buildings in Wasatch Front cities.

Pechmann said: "We could have a large, damaging earthquake at any time and everybody should be prepared for it."

Allison and Pechmann said shaking from Thursday's quake bolsters the argument for stricter building codes along the Wasatch Front.

Thursday morning's quake illustrated the confusion over quake-magnitude scales. John Minsch of the USGS National Earthquake Information Center in

Golden, Colo., said the jolt measured 5.5 on the body-wave magnitude scale, 5.8 on the local-magnitude scale and 5.9 on the moment-magnitude scale.

Quick recordings of most quakes use the body-wave or surface-wave scales. Scientists consider moment magnitude to be the most accurate measure of energy released by moderate to strong quakes. Local magnitude is considered best for measuring small to moderate quakes. The so-called Richter scale is the local-magnitude scale, but quakes measured on any of the scales often are referred to as Richter magnitudes so scientists don't have to explain the difference.

[Salt Lake Tribune; February 4, 1994]

THURSDAY'S QUAKE LEAVES MORE AFTERSHOCKS THAN USUAL IN ITS WAKE

By Lee Siegel

An unusual number of aftershocks bumped the Idaho-Wyoming border Friday as Utah scientists planted more earthquake monitors in the area.

Five or more aftershocks of magnitude 3.5 or stronger rattled the area Friday morning and afternoon, including one greater than 4.0 at 12:33 p.m., said Sue Nava, a seismologist at the University of Utah Seismograph Stations.

Among dozens of aftershocks Thursday, four measured 4.4 to 4.6, and another registered 5.2.

"It is more than expected," Nava said. "It is a very energetic earthquake sequence."

She said faculty and students from the U. trudged in snow and frigid weather to place nine portable seismographs near the southeastern Idaho epicenter of the 2:05 a.m. Thursday main shock.

The tremor measured 5.5 to 5.9 in magnitude, injured one person and caused scattered damage, including a sagging roof and walls at a 53-year-old fish hatchery near Auburn, Wyo., operated jointly by Wyoming and Idaho.

Scientists named the tremor the Draney Peak earthquake because it happened under that 9,131-foot

mountain.

Dozens of Utahns streamed into the Utah Geological Survey's Salt Lake City office to fill out a survey about what they felt during the strong Idaho jolt.

Some reported cracked plaster and movement of heavy furniture, but most said they felt only gentle rolling from the distant tremor, state geologist Lee Allison said.

U. S. Geological Survey scientists planned to fly over southeast Idaho, southwest Wyoming and northernmost Utah looking for ground cracks, landslides or rock falls caused by the quake, spokeswoman Pat Jorgenson said.

Federal and Utah scientists disagreed over the precise location of the main quake and whether it happened on a known fault.

The USGS placed it on the Star Valley Fault, 10 miles northwest of Afton, Wyo., and 20 miles east of Soda Springs, Idaho. Nava insisted the U.'s measurements were more accurate, showing an epicenter 12 miles west of Afton and 25 miles east-northeast of Soda Springs.

[Salt Lake Tribune; February 5, 1994]

MORE HEFTY AFTERSHOCKS HIT IDAHO, WYOMING

The Associated Press

SODA SPRINGS, Idaho—More hefty aftershocks struck the same area of the Idaho-Wyoming border where a moderate earthquake rattled portions of four states last week.

Last Thursday morning, a quake measuring 5.5 to 5.9 in magnitude, rocked the Caribou National Forest northeast of Soda Springs, Idaho, and west of Afton, Wyo. Since then, seismologists have recorded some 50 aftershocks measuring 3.5 magnitude or greater, the largest a 5.2 shaker Thursday night.

No damage or serious injuries were reported from any of the quakes.

A 4.8 aftershock happened at 5:15 a.m. Monday; a 5.0 tremor occurred at 11:35 p.m. Sunday, according to the University of Utah Seismograph Stations.

"Nobody has really called. I guess they're getting used to it," said John Minsch, a seismologist with the National Earthquake Information Center in Golden, Colo.

Sunday night's aftershock was felt as a short, strong jolt in Afton, but Lincoln County sheriff's dispatcher Kris Jensen said residents seemed to be taking the aftershocks in stride.

[Salt Lake Tribune; February 8, 1994]

BIGGEST AFTERSHOCK REMINDS UTAHNS: IT'S QUAKE COUNTRY

By Lee Siegel

Roughly 500 detected earthquakes have shaken the Idaho-Wyoming border since a strong jolt Feb. 3. The strongest aftershock so far was Friday morning's magnitude 5.6 tremor that produced gentle rolling 135 miles away in Salt Lake City.

Much closer to the epicenter "it was — oooooooooohhh — a real rumble," said Nora Jo Taggart, a Lincoln County sheriff's dispatcher in Afton, Wyo.

"I'm ready for it to end," she said. "I'm tired of it. People don't sleep as good at night. Nerves are frayed. I don't like it."

There were no reports of injuries around Afton or across the border near Soda Springs, Idaho. Taggart said she received reports that some homes sustained cracked walls, foundations and chimneys. Lamps overturned, objects fell and pictures flew off walls, she said.

Salt Lake City-area callers deluged the University of Utah Seismograph Stations. Seismologist Sue Nava asked citizens to refrain from making such calls within two hours after a quake so scientists can get information to the news media as quickly as possible.

Friday's aftershock happened seconds before 8 a.m. and was pegged at 5.6 on the Richter scale by the U., which placed the epicenter eight miles west of Afton. The U. S. Geological Survey said the quake measured 5.3 on another scale and was centered 10 miles northwest of Afton.

Pat Jorgenson, a USGS spokeswoman in Menlo Park, Calif., conceded the U.'s measurements were more accurate because the school has more seismometers close to the epicenter.

The aftershock on Friday was almost as strong as the Feb. 3 main shock that measured 5.5 to 5.9, depending on the scale used, with 5.9 considered most accurate. The quake activity started Jan. 30.

The second- and third-strongest aftershocks measured 5.5 on Feb. 3—a quake initially estimated at 5.2—and another tremor of 5.0 on Sunday, Nava said.

Other hefty aftershocks included jolts measuring 4.0 and 4.2 Thursday night.

There have been roughly 500 detected aftershocks so far, and by Friday morning, 60 measured 3.5 or larger, Nava said.

The number of aftershocks has been above normal, but not to an extreme. In California, an unusually active aftershock sequence sometimes suggests an even stronger quake might be on the way. Too little is known about earthquakes in the Intermountain West to make the same conclusion here, Nava said.

The quake sequence conceivably might yield a jolt measuring 6.0 or stronger in the same area, but the probability is now well below 1%, she said.

Nava said that, contrary to a false rumor, activity on the Idaho-Wyoming border isn't directly related to Utah's Wasatch Fault, and is extremely unlikely to trigger any quakes so far away.

Nevertheless, the quakes "are gentle reminders that this is active earthquake country and we need to take steps to be prepared when this happens in the Wasatch Front," she said.

Jorgenson said the USGS was wrong in claiming the Feb. 3 main shock happened on the Star Valley Fault. She said scientists found no movement on that fault. The U. has insisted the main shock was centered on an unrecognized fault under Draney Peak in the Webster Range.

USGS geologist Robert Schuster toured towns near the recent quakes, and was amazed damage was so light, Jorgenson said. By comparison, a 5.9 quake near Klamath Falls, Ore., on Sept. 20 destroyed two or three buildings and caused numerous landslides, she added.

[Salt Lake Tribune; February 12, 1994]

OVER 140 QUAKES TREMBLE THROUGH STAR VALLEY

Quake Magnitudes Range From 2.8 To 5.9

WSGS Say Two Months Of '94 Quakes Almost Equals All Of '93

By Dan Dockstader

"They are occurring faster than we can keep up with them," John Minsch, geophysicist with the U.S. Geological Survey's National Earthquake Information Center (NEIC) told the Independent Thursday morning, Feb. 3. The NEIC monitors earthquakes at its Golden, CO office with the help of several seismograph regional stations and is the official reporting center for all earthquake activity in the United States.

Star Valley residents were glad to see the sun come up that morning after a night filled with earthquakes and related aftershocks.

Most notable were the two earthquakes that struck at 12:15 a.m. and 2:05 a.m. The first measured 4.5 on the Richter Scale and awakened most residents. The second, measured 5.9 and few valley residents were left undisturbed. Not only did the second large quake shake Star Valley, but Soda Springs and Montpelier residents responded to it and the National Earthquake Center reported that it was "felt quite strongly" in Grand Junction, CO, Salt Lake City and as far south as Price, UT. Its epicenter was placed at 10 miles northwest of Afton by Auburn on the Wyoming-Idaho border.

"It was fairly large so it is not unusual that it was felt in parts of four states," Minsch said.

Monday, Feb. 7, Minsch updated the report for the Independent. "We have located over 100 events, that's earthquakes and aftershocks," he said. "They have

ranged from 2.8 to three and above." He noted that the largest quake at 2:05 a.m. on Feb. 3 had originally been reported as a 5.5 on the Richter Scale but had been upgraded the following day based on additional research.

On Wednesday, Feb. 9, Minsch updated the report to over 140 earthquakes ranging from 2.7 and up in the Star Valley region since Feb. 1.

According to a report released through the office of the Wyoming State Geologist, over 42 earthquakes with magnitudes ranging from 2.7 to 5.2 occurred within 24 hours of the largest earthquake. The state geologist's office noted that 16 of those have been located in Wyoming, with the rest located just west of the Wyoming-Idaho state line. As of Feb. 4, eight earthquakes were reported to have occurred at a location just to the northwest of the largest event near Auburn.

The State Geological Survey notes that as a result of this activity, there have been almost as many earthquakes in Wyoming so far this year as in all of 1993. According to the survey, in 1993, 21 earthquakes with magnitudes of greater than 2.9 occurred in Wyoming, culminating with a magnitude 4.7 event in eastern Teton County on Dec. 28, 1993. The survey also pointed out there were more earthquakes in Wyoming in 1993 than in any single year for the previous 10 years.

[Star Valley Independent; February 10, 1994]

EARTHQUAKES LEAVE VALLEY WITH LIMITED DAMAGE USGS Official Tours Valley Area And Surprised There Is Not More Damage

By Dan Dockstader

Limited residential and public building structural damage was reported following the series of earthquakes that shook the Star Valley region on the first week of February.

Cracked or disturbed foundations have been noted in the Tygee Valley and Crow Creek areas following the most powerful 5.9 earthquake at 2:05 a.m. Thursday, Feb. 3.

Lincoln County Undersheriff Mike Hansen noted that a Tygee residence suffered a cracked foundation and the Wyoming Game and Fish Auburn Fish Hatchery in the same valley reported that a support wall on the main building had shifted. Structural shifting was also evident on residences in the Crow Creek area.

Lincoln County School District No. 2 reported that new cracks had been discovered in several of their school buildings but it did not appear to be serious. Local contractors have already reviewed the buildings and a structural engineer will visit the schools again this week. "It's noticeable by evidence described as settling cracks, small hairline cracks usually extending vertically from the ceiling down to a door or window," Supt. Dr. Allen Lowe said. "We have not seen anything in the way of major damage like broken windows, damaged roofs or caved in walls." He added, "A structural engineer will visit the schools this week

and will make further inspection and determination regarding any special kind of repair work. We are anticipating none but to be on the safe side we have asked the engineer to come in."

Small building cracks have been observed at the Afton schools, Cokeville schools and new auditorium, Osmond Elementary and Star Valley Jr. High.

While several private wells in Star Valley reported muddied water in the days following the major earthquake on Feb. 3, Afton Utilities Supt. Lael Eddins reported that Swift Creek Intermittent Spring, Afton's municipal water source, was fine. "I just came from the geyser and it looks good to us," Eddins said on Thursday afternoon. "It is running about eight minutes and shutting off; it is just as regular as could be."

Robert Schuster with U.S.G.S. branch of earthquake and landslide hazards toured the Star Valley and Tygee areas on Friday and Saturday mapping any cracking and sliding, however small. "I almost can't believe it—the lack of activity, the lack of cracks and landslides," said Schuster.

Schuster made reference to an earthquake of similar magnitude on Sept. 20, 1993 at Klamath Falls, OR where extensive damage and two deaths were reported. That earthquake started with a 3.9 foreshock at 8:16 p.m. and it was followed by two main shocks measuring 5.9 on the Richter Scale at 8:28 p.m.

[Star Valley Independent; February 10, 1994]

U OF U SEARCHES FOR FAULT IN DRANEY PEAK EPICENTER AREA

Portable Seismograph Stations Placed In Star Valley

Signals Sent Directly Back To Salt Lake City On Dedicated Line

By Dan Dockstader

University of Utah officials are looking for a fault in the newly designated Draney Peak Epicenter area west of Star Valley where over 130 earthquakes or related aftershocks ranging from 2.8 to 5.9 have been recorded by seismograph stations in Utah, Colorado and Idaho within the past week.

"We are in the process of deploying portable seismograph equipment around the Draney Peak Epicenter," Sue Nava, staff seismologist with the U of U seismograph stations, told the Independent on Tuesday. "And we presently have instrumentation in the general area of Star Valley that is sending data back to Salt Lake City."

She explained when an earth tremor occurs the portable equipment strategically located around the valley sends a radio signal to a special receiver just installed at the Greys River Ranger District Office in Afton. Information received at that computer based site is then immediately transmitted to the U of U seismographs office on a dedicated telephone line.

Using that information seismologists hope to

locate the fault that has resulted in the repeated earthquakes that started in the Star Valley area on Feb. 1 and have continued to date. Similar portable equipment has been installed in the Soda Springs and Georgetown areas.

Nava noted that previously existing permanent seismograph stations at Bear Lake and Alpine provide information about epicenter locations, but by placing the new equipment in the region additional data will become available on the depth of the earthquakes. This combined data should help researchers locate the fault causing the earthquakes.

"Everyone would like to know what fault this is on," Nava said. "Because we have had an earthquake there is a fault. If it is [related to] the Star Valley fault or an unnamed buried fault we can't say at this time."

Geologists have mapped the Star Valley fault which runs along the east mountains between Alpine and Smoot. It is visible above ground in many locations along the base of the eastern hills.

[Star Valley Independent; February 10, 1994]

EARTHQUAKE FELT STRONGLY IN TYGEE AND CROW CREEK

By Dan Dockstader

The 5.9 earthquake that rumbled through Star Valley during the early morning hours of Feb. 3 left few people undisturbed.

The major force of the quake appeared to be felt most on the west side of the valley, and in the Tygee area and southwest in the Crow Creek and Spring Creek areas.

At the Harvey Kennington residence in Crow Creek a window was broken on the back of the house, dishes fell from cabinets and several bottles of fruit broke in the basement. "The glass was the worst," Kennington reflected. "It broke a lot of glass dishes."

At the Lyman Harmon residence in Spring Creek, Anita Harmon reported that important athletic and cutter race trophies were broken when they fell from shelves, pantries were dumped out, bookshelves were shook right out of their brackets and water was rocked

out of toilet tanks. "We lost our power and we could still hear things crashing in the house [during the earthquake]," Anita recalled.

At the Wyoming Game and Fish Auburn Fish Hatchery in Tygee a large building constructed in 1940s suffered damage in the main series of earthquakes. The largest earthquake offered no warning when it struck the hatchery area. "I was in the house and there was just a real sharp sudden jolt," said Ralph Bonner, hatchery superintendent. "There was no warning; it was just like a truck ran into the house."

Bonner noted that later quakes in the week provided some initial warnings with small waves.

The main hatchery building will remain closed to the public until all of the structural engineering studies are complete.

[Star Valley Independent; February 10, 1994]

MEDIA CONVERGE ON STAR VALLEY

In the wake of the Northridge Earthquake in southern California where people were killed and buildings collapsed amidst an earthquake with a 6.6 rating on the Richter Scale, regional media swarmed into Star Valley Thursday following the 2:05 a.m., 5.9 quake.

Lincoln County Undersheriff Mike Hansen said the CBS, NBC and ABC affiliates from Salt Lake City and southeast Idaho all had television crews in the valley. He noted that the Salt Lake stations brought satellite

television trucks and channel five, KSL, toured the area in their helicopter.

In addition, Hansen said he fielded interviews from media in Denver, Grand Junction, Casper, Riverton, Jackson and Kemmerer.

"There was an enormous response from the large media sources," said Hansen. "In my opinion they came because of the attention caused by the California earthquake."

[Star Valley Independent; February 10, 1994]

LOCAL EARTHQUAKE ACTIVITY IS DECLINING THIS WEEK

As of Wednesday, Feb. 9, at 3 p.m. the U.S.G.S. National Earthquake Information Center in Golden, CO reported that only one aftershock with a magnitude of 2.7 on the Richter Scale had been recorded in the past 24-hour period in the Star Valley area.

John Minsch, geophysicist, agreed that the number of quakes appeared to be diminishing but he declined to speculate on what that meant. He recalled that at one time during the past week there were no quakes

recorded for a 12-hour period and then a 4.8 aftershock was recorded.

Sue Nava, staff seismologist at the University of Utah Seismograph Stations in Salt Lake City, said on Tuesday the earthquakes in the Star Valley area are "decaying" and there are "fewer earthquakes" but she pointed out that there could still be a possibility of more occurring.

[Star Valley Independent; February 10, 1994]

U OF U SEISMOLOGIST FIELDS STAR VALLEY'S EARTHQUAKE QUESTIONS **Queries Cover Increase Earthquake Activity And Aftershocks** **To Differences Between The Jolts And Waves**

By Dan Dockstader

With earthquakes still fresh on the minds of many Star Valley residents, over 200 people gathered in the high school auditorium Tuesday night to hear a presentation and ask questions of Sue Nava, senior staff seismologist with the University of Utah.

At the invitation of Lincoln County School District No. 2, the officials with the U of U's Seismograph Stations gave presentations at the valley's elementary schools throughout the day and concluded with the evening program at the high school.

The following is a summary of questions fielded by Nava and her responses:

Why are we having the earthquakes all of a sudden? You have always had them here, but not in most of your living history. Reference was made to the June 13, 1930 Grover earthquake with a magnitude of 5.8.

Are we having more earthquakes than we should? Not more than normal this is an average sequence. But a 5.9 is a large earthquake and you are going to have a lot of aftershocks. You are having the normal amount of aftershocks for an earthquake of this size. You are on the downhill side and have been for quite a few days. But it would not be unusual to have a magnitude five within six months [of the main-shock].

Will there be larger earthquakes soon? Statistically there is a six percent chance of a large quake happening in five days after a 5.9. You never say never in the earthquake business but it is highly unlikely.

Are the earthquakes related to the Star Valley fault [on the east side]? My intuition tells me it is not

the Star Valley fault but we haven't proven that yet. We know it is on a fault. We need to analyze the data. It could take many months to determine or even a year. It's a long tedious process to analyze all of the information.

Has the ground settled or raised with these earthquakes? That information is not available because there has been no extensive survey work completed prior to the earthquakes.

Has there been any surface faulting? Generally that only occurs with a 6.5 magnitude earthquake but there could be some under the surface of the snow.

Do the aftershocks release pressure? In a general sense that is true. However, an aftershock is a readjustment of rock that has already been displaced.

Is there a percentage formula for figuring damage around the epicenter area? There is no hard fast formula but generally there is no severe damage in the areas over 50 miles away from the epicenter. It varies depending on geologic conditions and building types.

Why is there very little damage? You are not as densely populated as southern California. There are not many buildings and freeways to damage. You are fortunate to live in a rural area. Damage from a 5.9 in Salt Lake City would have been much higher.

Could this effect water springs? Yes, it could reduce or increase the flow and muddy the water.

Why are there different feelings with each quake? There are two main types of earthquake waves. The P-wave comes up from the bottom and is a sharp jolt generally felt close to the epicenter. The S-wave is generally felt as a ripple effect.

What about the noise? The noise you all hear is a sound wave. When it comes out of the earth it moves the air. You are hearing the wave exiting the earth.

Why was it felt so far south of Star Valley? We really don't understand all that goes on in an earthquake but it could be that the Wasatch Mountains acted as a conduit for the waves.

Does the magnitude change the further away you are from the epicenter? The magnitude of the earthquake is the same wherever it is felt and does not vary with distance.

Why will one house feel an earthquake more than another? It depends on the construction of the home and the soil it is located on. Also, the homes are spread out here so it may be possible for occupants of one to feel the earthquake and another won't feel it.

When you recorded the foreshocks prior to the main earthquake, could you have predicted anything bigger coming? We cannot predict earthquakes. Our seismograph network is not funded to cover this area. The U of U station has the responsibility of monitoring the state of Utah and Yellowstone Park.

Is anyone responsible for monitoring this area?

No. We suggest calling your congressman or state-level representatives in order to receive funding to be a part of seismograph network. Wyoming does not have an earthquake monitoring process.

Why is the U of U covering this earthquake now?

The U.S.G.S. has allotted \$10,000 to monitor and do a study on this series of earthquakes related to the Draney Peak Epicenter.

Why are the portable seismograph stations being placed in the valley? We will better understand the depth of the earthquakes, what fault it is on and what is expected in the future.

Where are you putting the portable monitors?

We want them as close as possible to the activity. They are placed on the west side of the valley, on the west hills and in the Crow Creek and Tygee Valley areas.

What about the rumors of magmatic or volcanic activity in the area? There is no truth to that rumor.

What about the earthquakes timing? Earthquakes don't care about the time of day, weather or the season.

[Star Valley Independent; February 17, 1994]

EARTHQUAKE SUMMARY FOR FEB. 10 - 16

By Dan Dockstader

Small aftershocks to the Feb. 3 earthquake west of Star Valley that measured 5.9 on the Richter Scale continued to tremble though the valley as late as Wednesday, Feb. 16. The University of Utah Seismograph Stations recorded a 3.7 aftershock at 10:23 a.m. Feb. 16 and then as 2 p.m. Wednesday, Feb. 16, the seismograph stations had not recorded any significant aftershocks.

A 3.8 magnitude aftershock hit the area at 8:59 p.m. Monday, Feb. 14.

The U of U Seismograph Stations reported that the strongest aftershock since the mainshock hit the area at 7:59 a.m. Feb. 11. It had a magnitude of 5.6. The epicenter of that quake was located eight miles west of Afton, close to the epicenter of the Feb. 3 mainshock. The Lincoln County Sheriff's Office said there were reports of some hair-line cracks at residences in

Fairview and Grover. It was felt in Kemmerer, Rock Springs and Salt Lake City.

The university noted that two sizable aftershocks also occurred Feb. 10. The first came at 7:20 p.m. and had a magnitude of 4.0 and the second was at 9:24 p.m. and had a magnitude of 4.1. Both of these aftershocks were located nine miles northwest of Afton.

In related news, Lincoln County School District No. 2 Supt. of Schools Allen Lowe reported that the schools have been inspected by a structural engineer and declared safe.

Chris Wood, geophysicist with the Bureau of Reclamation, reported that no damage has occurred at the Palisades Dam as a result of the Star Valley area earthquakes. He noted that monitoring equipment is in place at the dam, which is engineered and designed according to earthquake specifications.

[Star Valley Independent; February 17, 1994]

GEOLOGICAL SURVEY RELEASES UPDATED APRIL EARTHQUAKE REPORT Most Epicenters Located In Southeast Idaho But Quakes Can Still Be Felt In Star Valley

By Dan Dockstader

The Geological Survey of Wyoming has updated their earthquake count for the Star Valley area for the month of April.

Jim Case, staff geologist-geologic hazards, explained that further study of the information from the U.S.G.S. and the University of Utah has provided additional information to a listing of earthquakes released earlier in mid-April. The latest report also includes new listings for the latter part of April.

Again, Case emphasized that the list will not contain all of the earthquakes recorded, but only those with a magnitude large enough to be felt in the Star Valley region.

The earthquake summary for April is as follows:

>April 2, Saturday, four earthquakes with magnitudes ranging from 2.8 to 3.8.

>April 4, Monday, three earthquakes with magnitudes ranging from 2.7 to 3.0.

>April 7, Thursday, six earthquakes with magnitudes ranging from 2.7 to 4.8.

>April 8, Friday, five earthquakes ranging from 3.2 to 4.1.

>April 9, Saturday, one earthquake with a 3.8 magnitude.

>April 10, Sunday, one earthquake with a 4.6 magnitude.

>April 11, Monday, one earthquake with a 2.8 magnitude.

>April 13, Wednesday, one earthquake with a 2.6 magnitude.

>April 15, Friday, one earthquake with a 3.7 magnitude.

>April 29, Friday, three earthquakes with magnitudes ranging from 2.6 to 3.4.

"Most of the earthquakes (during April) were located in southwestern Idaho," Case reported to the *Independent* in a telephone interview late Tuesday. He added, "But they were of a magnitude that allowed them to be felt in Star Valley."

He also noted that a few of the earthquake epicenters had been traced to western Wyoming.

Case concluded that additional information will become available as the University of Utah data base is studied on the series of earthquakes that rumbled through Star Valley throughout the winter and spring. The mainshock for the series was a magnitude 5.9 recorded on Feb. 3.

[Star Valley Independent; May 5, 1994]

AFTON SHAKEN BY QUAKES

AFTON (AP)—Moderate earthquakes near Afton left residents of western Wyoming shaken this morning, but officials said there were no reports of serious injuries or major damage.

Mike Michalek, a spokesman for the Wyoming Emergency Management Administration, said his office had been told that the earthquakes that occurred at about 12:15 a.m. and 2:06 a.m. caused no major problems.

"Right now I don't think we're looking at any real major property or health concerns," he said. "It's just that people have been shocked by this. We don't expect this in Wyoming."

The National Earthquake Information Center in Golden, Colo., reported the first of the two earthquakes, centered about 10 miles northwest of Afton, measured 4.5 on the Richter Scale, while the second measured 5.5.

While considered moderate earthquakes, the two may be the strongest on record for the region, said Waverly Person, director of the Earthquake Information Center.

The earthquakes shook items off of shelves in Afton near the Idaho border and were felt as far south as Rock Springs, Grand Junction, Colo. and Provo, Utah.

Person said the two earthquakes were the apparent culmination of a series of earthquakes that began with one measured at 3.2 on Jan. 30. All of the earthquakes

have been centered in Idaho's Caribou National Forest.

Chris Wood, with the U. S. Bureau of Reclamation, said smaller earthquakes were also felt Tuesday and Wednesday.

Jim Gallagher, manager of the 7-Eleven store in Afton, said he had heard of no major damage from the earthquake.

"It broke a few dishes," he said. "We're in good shape."

Gallagher said he was awakened by the second earthquake.

Michalek said earthquake preparedness information has been sent by fax to law enforcement and emergency management officials in Lincoln County to advise residents on what to look at in the aftermath of the earthquakes.

"We want to give a heads-up to individuals on what they have to do, double-check their gas mains and water mains and insure the structural integrity of their homes," he said.

Law enforcement officials in Afton could not be immediately reached today because phone circuits were busy.

Earthquakes are common to the north of Afton in the Yellowstone National Park area and seismologists have said the Jackson Hole area is overdue for a major earthquake.

[Wyoming State Tribune; February 3, 1994]

EARTHQUAKES BEHAVING UNUSUALLY: SMITH

AFTON (AP)—Two earthquakes that shook western Wyoming on Thursday appear to have released an unusual amount of energy, according to a geophysicist.

Robert Smith, a geophysicist from the University of Utah, said the earthquakes measured at 4.5 and 5.5 on the Richter Scale were followed by an unusually high number of aftershocks.

"We've had, by 4 p.m. (Thursday), 30 aftershocks of 3.5 and larger and that means earthquakes that are capable of being felt," he said. "For a magnitude of 5.5 or so, we should only have two or three (aftershocks) in that period of time. So it's a particularly energetic earthquake and it's releasing a lot of energy . . . and that's really unusual."

While the National Earthquake Information Center in Golden, Colo., said the magnitude of the second earthquake was 5.5, seismologists at Harvard University, the U.S. Geological Survey and the University of California at Berkeley said the second quake was closer to 5.8 or 5.9 in magnitude.

The earthquakes caused no serious injuries and little damage to structures in western Wyoming, although a state Game and Fish Department spokesman

said a fish hatchery suffered extensive damage.

Smith was in Star Valley on Thursday to study the earthquakes centered in Idaho's Caribou National Forest. He said the quakes appeared to occur on a fault that has not been mapped in the past.

"There's no mapped structure we can put our fingers on now," he said. "It's relatively remote. There's not a lot of mapping here, but it's certainly not a regular fault structure."

Geologists are puzzled by the fact the aftershocks continued for more than 12 hours after the main earthquakes, Smith said.

One aftershock of 5.2 occurred at 7:42 p.m. Thursday, the University of Utah Seismograph Stations reported.

Earthquakes are common north of Afton in the Yellowstone National Park area and geologists have said the Jackson Hole valley is long overdue for a major earthquake.

An earthquake in Yellowstone's Hebgen Lake area in August 1959 registered 7.1 on the Richter Scale and resulted in 28 deaths.

[Wyoming State Tribune; February 4, 1994]

CALLERS JAM 911 LINES

SALT LAKE CITY (AP)—If you feel the ground shake, but aren't injured, don't call the 911 emergency number and ask: "Was that an earthquake?"

Emergency officials issued that reminder Thursday after the strongest of two quakes near the Idaho-Wyoming border woke up Salt Lake residents, hundreds of whom promptly dialed 911.

"They all wanted to know if we just had an earthquake," said a Salt Lake police dispatcher. "If someone would have really needed help it would have

been ugly. They couldn't have gotten through."

Salt Lake City Fire Battalion Chief Ren Egbert said that after the 5.5 magnitude quake at 2:06 a.m. caused buildings to sway in Salt Lake City, emergency lines lit up, even though there was no damage or injuries.

"The 911 telephone number is for emergency use only, not for information," Egbert said.

[Wyoming State Tribune; February 4, 1994]

AFTERSHOCK STRIKES BORDER AREA AGAIN

SODA SPRINGS, Idaho (AP)—A strong aftershock struck the same area of the Idaho-Wyoming border late Sunday night where a moderate earthquake rattled portions of four states last week.

Last Thursday morning, a quake measuring 5.8 to 5.9 magnitude on the Richter scale, rocked the Caribou National Forest 25 miles northeast of Soda Springs, Idaho, and 10 miles northwest of Afton.

Since then, seismologists have recorded some 50 aftershocks measuring 3.5 magnitude or greater, the largest a 5.2 shaker Thursday night.

No damage or serious injuries were reported from any of the quakes, including Sunday night's 4.8 magnitude aftershock, which was recorded at 11:36 p.m. MST.

"Nobody has really called. I guess they're getting

used to it," said John Minsch, a seismologist with the National Earthquake Information Center in Golden, Colo.

Calls to the University of Utah Seismograph Stations early this morning went unanswered.

However, there were no reports of the quake being felt much beyond its epicenter.

It was felt as a short, strong jolt in Afton, but Lincoln County sheriff's dispatcher Kris Jensen said the area's residents seemed to be taking the aftershock in stride.

"It wasn't so strong that anybody would be thrown out of bed with it," Jensen said. "I bet it only lasted five seconds at the most, but it was pretty strong."

[Wyoming State Tribune; February 7, 1994]

4.5 AFTERSHOCK HITS IDAHO-WYOMING BORDER

SODA SPRINGS, Idaho (AP)—Another earthquake has struck the Idaho-Wyoming border following last week's 5.9 magnitude temblor and several strong aftershocks.

The moderate quake, measuring 4.5 on the Richter scale, was recorded at about 6 p.m. MST Wednesday, said U.S. Geological Survey spokeswoman Pat Jorgeson.

There were reports the quake—centered 40 miles north-northeast of Montpelier, Idaho—was felt by residents in Afton, she said.

"This is the latest in a series of moderate

earthquakes that followed the one last week," Jorgeson said.

The earthquake last week that measured 5.9 magnitude on the Richter scale rocked the Caribou National Forest 25 miles northeast of Soda Springs, Idaho, and 10 miles northwest of Afton.

Since then, seismologists have recorded some 50 aftershocks measuring 3.5 magnitude or greater, the largest a 5.2 shaker Thursday night.

No damage or serious injuries were reported from any of the aftershocks.

[Wyoming State Tribune; February 10, 1994]

AFTERSHOCK OF 5.6 HITS IDAHO-WYOMING BORDER

SODA SPRINGS, Idaho (AP)—An earthquake measuring 5.6 on the Richter scale, the latest in a series of shocks since Jan. 30, struck this morning on the Idaho-Wyoming border, causing minor damage near the epicenter.

Seismologists at the University of Utah Seismograph Stations in Salt Lake City said this morning's aftershock was the largest to date following the 5.9 main shock on Feb. 3.

The tremor at about 8 a.m. MST was centered 8 miles west of Afton, and 25 miles east and northeast of Soda Springs in the Caribou National Forest, according to the University of Utah seismologists.

"At one residence, the step was pulled away from the building, the door moved and we've had cracks in one of our deputies' houses—he's over there now," said Nora Jo Taggart, dispatcher for the Lincoln County sheriff in Afton.

"Things fall off walls, lamps tip over. We've been swamped (with phone calls), though. That was a good one," she said.

The quake was felt by residents as much as 130 miles away in Salt Lake City and Park City, Utah, and in Rock Springs and Green River, about 180 miles southeast of Afton.

The temblor was the latest in a cluster of quakes that have occurred in the area almost daily since Jan. 30, beginning with one of 3.2 magnitude. On Feb. 3, an earthquake of 5.9 magnitude, the largest in the

series, was felt widely in a four-state area of the Intermountain West.

On Wednesday, a moderate quake measuring 4.5 on the Richter scale occurred in the same area.

Chuck Young, Lincoln County emergency management coordinator, said there were unconfirmed reports of broken windows.

"We have had reports of people feeling the quake in Kemmerer," the county seat about 100 miles southeast of Afton, he said.

There were similar reports from the Star Valley area around Afton, where the dispatch center was being "inundated with phone calls," he said.

"This one was really strong and it was really loud," Taggart said in Afton. "The floor in here just shook. It was really a loud roar, the loudest roar I've heard, and I've had other people call in and say that."

Taggart said there were no reports of injuries or power outages and schools weren't affected.

"It's eerie. It's a roaring under your feet like the earth's going to open up. Like thunder, but it's different," she said.

Taggart said today's quake felt stronger than the 5.9 shaking, although the Richter reading did not bear that out.

"This one was noisier than the one last week; it felt a lot bigger to me" and to callers, she said.

[Wyoming State Tribune; February 11, 1994]

AFTON'S ON EDGE WITH AFTERSHOCK

AFTON (AP)—Another in a seemingly endless series of earthquakes shook western Wyoming Friday morning. And again, the quake, while of significant magnitude, did little damage.

Unless you consider the residents' nerves, which are fraying like an old rope.

"People in California probably take this with a grain of salt and don't pay attention to it. They get them all the time," said Jerry Mower, assistant principal and athletic director for Star Valley High School at Afton. "But for us, it's unnerving."

Friday's 5.6 magnitude quake occurred about 8 a.m. MST and was one of several hundred aftershocks that have followed a 5.9 quake on Feb. 3. That main quake had been preceded by an earthquake swarm that began Jan. 30.

Since Feb. 3, more than 60 aftershocks have topped 3.5 magnitude, said University of Utah seismologist Sue Nava.

The quakes all have been centered eight miles west of Afton and 25 miles east and northeast of Soda Springs, Idaho, in the Caribou National Forest, said University of Utah seismologists.

Two sizable aftershocks rattled the area Thursday night, the first a 4.0 magnitude at 7:20 p.m., the second a 4.1, at 9:24 p.m.

"We are hoping these damn things will start to tail off," Mower said after Friday's aftershock. "The word we have is that they are starting to tail off, but we keep getting jolts."

The shock was felt by residents as much as 130 miles away in Salt Lake City and Park City, Utah, and in Rock Springs and Green River, Wyo., about 180 miles southeast of Afton.

Chuck Young, Lincoln County emergency management coordinator, said the sheriff's dispatch center was "inundated with phone calls."

"Things fall off walls, lamps tip over. We've been swamped (with phone calls)," said dispatcher Nora Jo Taggart in Afton.

"This one was really strong and it was really loud," Taggart said. "The floor in here just shook. It was really a loud roar, the loudest roar I've heard, and I've

had other people call in and say that."

"It's eerie. It's a roaring under your feet like the earth's going to open up. Like thunder, but it's different," she said.

Taggart said Friday's quake felt stronger than the 5.9 shaking.

"This one was noisier than the one last week; it felt a lot bigger to me" and to callers, she said.

"It seems like they were starting to (get used to the quakes), and then this big one hit this morning," she said. "I think everybody's real nervous."

Elkhorn Family Restaurant manager Linda Barrus agreed.

"In fact, my day cook is wanting to go home real bad. People are feeling they want to be home with their families in case something bad does happen. I want to get my kids out of school and stay at home with them, she said.

At the Golden Spur Cafe in Afton, earthquakes are the main topic of conversation, said Betty Veitch, who runs the cafe during the day.

"They're talking about the animals that are frightened," she said. "Of course, none of the men talk about how they're frightened. But they talk about how their wives are frightened."

There were reports of minor damage in Afton, but officials in Soda Springs, 30 miles west in Idaho, had received no damage reports and only a few calls from residents startled by the quake.

Taggart said there were no reports of injuries or power outages and schools weren't affected. The only damage reported was a few cracks in houses, a step that was pulled away from a building and some unconfirmed reports of broken windows—in short, not much.

But the week of temblors is exacting its toll.

"I think the main thing is the animals not letting people sleep at night," said Veitch. "Dogs are barking. I have two small ones, and when they feel something, they'll come running and jump right up on the bed with me."

[Wyoming State Tribune; February 12, 1994]

WORSE QUAKES YET TO COME, OFFICIAL SAYS

By Pam McCormack
LCCC Journalism Student

The tragic death and destruction from California's latest major earthquake may hold a silver lining for residents of Wyoming.

"We hope it can serve to increase awareness about our own earthquake potential," said Jim Case, head of the geologic hazards division of the Geological Survey of Wyoming.

On Feb. 3, Wyoming received its own "quake up" call.

Beginning three days before, the Western Star Valley area on the Wyoming-Idaho border began to experience a series of foreshocks with magnitudes ranging from 3.3 to 4.5 on the Richter scale. Then, at 2:05 Thursday morning, residents were jolted from bed when a magnitude 5.8 temblor ruptured.

At first, no one knew what to do. "It is common in earthquakes to have a period of confusion," Case said. "But within hours, city and county officials were on the scene helping residents deal with the situation in a proficient manner."

Aftershocks continue to hit the area as officials attempt to assess the damage caused from the unexpected quakes. To date, many homes and buildings are now known to have cracks and gaps where none were before. New cracks in the local dam have residents and officials nervous, and the Auburn fish hatchery received substantial structural damage. The power of the earthquake also woke up people in Salt Lake City, and was noticeably felt in Dubois, Green River, Jackson and northern Colorado.

Although the Star Valley earthquake was somewhat of a surprise, seismologists do expect the Teton region in western Wyoming to experience an earthquake with a possible magnitude of 7.5 sometime in the near future.

Lessening the surprise element and helping residents to prepare for earthquakes in their area are part of the geologic hazards division's job.

"We have to plan for the worst and hope for the best," Case said. "If awareness can be raised now in the state, unnecessary loss of lives and structures can be avoided in the future."

Because seismology, the study of earthquakes, is not an exact science, seismologists can only make predictions about earthquakes. By studying the geological record and using statistical analysis, they attempt to predict where an earthquake is likely to

rupture and how extensive it will be.

"Every county in Wyoming has experienced seismic activity of some kind in the last 120 years," said Case. During 1894-1897, a series of significant earthquakes jolted the Casper area with probable magnitudes of 5.5 to 6.1. In 1882, a quake with a probable magnitude of 6.5 violently shook the area between Laramie and Fort Collins, Colo.

In 1984, northern Albany County experienced a 5.5 magnitude earthquake that caused structural damage and was felt over half of the state. Within the last six months, the county has experienced three more quakes.

Statistics show the whole western portion of the state capable of earthquakes in the 7.5 magnitude range, the central portion capable of 6.7 magnitude quakes, and the eastern portion at least 3.0 magnitude quakes.

Earthquakes are a way the earth can relieve its stress. Pressure builds up by the movement of rocks within the crust. When a critical limit is reached, the rocks rupture and "snap" to a new position of equilibrium. Seismic waves then travel at high speeds throughout the Earth. It is these waves that can cause destruction and, sometimes, death.

In Wyoming, it is particularly hard to predict what kind of seismic waves will be generated and, therefore, it is difficult to judge the potential damage Case said.

Magnitude is what the actual original force of the earthquake was at the moment it ruptured. The formula is derived using the seismic waves registered on a seismograph and then expressed on the Richter scale. Although the numbers can be lower or higher, the basic scale runs from 0 to 8.9 magnitude.

"You do not have to have an earthquake with a high magnitude for it to cause a lot of damage," Case said. He warned that just looking at the predicted magnitude does not guarantee an accurate judgment of the potential damage from an earthquake.

The recent California earthquake registered a 6.6 magnitude. But, because it lasted longer than usual and the frequencies of the seismic waves were just right, the quake caused much more damage than expected, Case said.

To help raise earthquake awareness in Wyoming, the geological hazards division has prepared earthquake awareness packages that give information about how to prepare for an earthquake and what to do when one occurs. These packages can be obtained by

DRANEY PEAK, ID 1994 pg. 20
Feb. 3, 2:05 a.m. M5.9

WYOMING TRIBUNE-EAGLE

calling 766-2286.

[Wyoming Tribune-Eagle; February 5, 1994]

BREAKDOWN ON THE WYOMING QUAKES

Thursday:

◆ **12:15 a.m.**—First quake measures in at 4.6 on the Richter scale

◆ **2:06 a.m.**—A quake registering magnitude 5.8 strikes

◆ **By 4 p.m.**—Thirty aftershocks measuring 3.5

or larger are recorded

◆ **7:42 p.m.**—A 5.2 aftershock is recorded

◆ **8:10 p.m.**—A magnitude 4.0 aftershock is recorded

[Wyoming Tribune-Eagle; February 5, 1994]

Post Register

Daily 50¢ / Sunday \$1.50

IDAHO FALLS, IDAHO

Volume 63 Number 81

Earthquakes rattle Afton area

Shaken residents report no significant damage

**Associated Press
and Post Register**

Two earthquakes near the Idaho-Wyoming border shook portions of four states early today in what seismologists believe was the apparent culmination of an earthquake swarm under way for a week.

Though no damage was immediately reported in eastern Idaho, mild shocks were felt in Swan Valley, Pocatello, Jackson, Wyo., and Salt Lake City.

The two quakes occurred in a remote area of the Caribou National Forest, about 25 miles east-northeast of Soda Springs and 10 miles northwest of Afton, Wyo. Seismologists in Utah and Colorado said the possibility of stronger quakes still occurring during the swarm was small but could not be ruled out.

A swarm is a series of earthquakes with no distinctive main shock. A normal earth-

Seismologists in Utah and Colorado said the possibility of stronger quakes still occurring during the swarm was small but could not be ruled out.

quake sequence has foreshocks, a main shock and aftershocks. The main shock by definition is the largest of the sequence, said Sue Nava, senior staff seismologist with the University of Utah Seismograph Stations.

The second quake, measuring 5.5 magnitude on the Richter scale was felt in Grand Junction, Colo., about 300 miles from the epicenter. That quake occurred

Inside

A former pastor of the St. John's Episcopal Church in Idaho Falls is leading fund-raising efforts to aid earthquake victims in Southern California. **Page C1.**

about 2:06 a.m., said Bill Schmieder, a geophysicist with the National Earthquake Information Center in Golden, Colo.

A quake of 4.5 magnitude occurred about 12:15 a.m. in the same area, he said.

Dispatchers in Bonneville, Teton and Caribou counties said they had not received

See QUAKE, Page A3



any reports of injury or damage.

"It was just enough to wake people up. It was pretty gentle," said Judy Long, a Caribou County dispatcher in Soda Springs, which has about 3,100 people.

Afton authorities reported some minor damage.

"We really felt them," Jean Putnam, a Lincoln County dispatcher in Afton, said. "We've had reports of stuff falling off walls, but nobody has been injured."

Jim Gallagher, manager of the 7-Eleven store in Afton, also said he had heard of no major damage from the earthquake.

"It broke a few dishes," he said. "We're in pretty good shape."

In Swan Valley, Dwight Yonts, operations supervisor at the Palisades Dam for the Bureau of Reclamation, said he had received several calls this morning from concerned residents, though he hadn't heard any reports of damage.

"A preliminary investigation shows no damage at all (to the dam)," he said. "We don't anticipate any."

Yonts said the "only thing I felt was the phone ringing." It was a long morning for Yonts, who had to make two inspections of the dam.

"We just got through with the first one when the second one hit, so we had to do it all over again," he said. "It's part of the job."

Other Swan Valley residents reported pets felt the quake more than they did.

Barbara Davidson, of Irwin, said she would have slept through the quake had it not been for her canary. "She was just a chirping and raising all kinds of Cain," she said. "I think the animals are more sensitive than we are."

Rayna Traugher, of Swan Valley, said her pot-bellied pig awoke her and her husband, and other residents she had talked to said their dogs and cats were acting up.

Trish Gorman, a dispatcher for the Teton County Sheriff's Department in Jackson said the office had re-

ceived several calls from people asking about the quake. Some reported feeling slight shaking in their homes, but again no damage has been reported.

"I felt it. It woke me up," Gorman said. "The house creaked and the bed shook. But I'm from California, so I'm used to it."

Earthquakes are common to the north of Afton in the Yellowstone National Park area and seismologists have said the Jackson Hole area is overdue for a major earthquake.

But Jim Case, head of the Hazard Section for the Wyoming Geologic Survey, said it is impossible to determine when a similar event might occur.

"The best we can do from a geological standpoint is say there are certain kinds of events we expect as maximum events," he said. "For example, there are some (earthquakes in the) magnitude of 7.5 in the Western part of the state that can occur and have occurred in the geologic record. But we don't know exactly when that kind of event will occur in the future. It probably will, but we don't know when."

Waverly Person, a geophysicist with the earthquake center at Golden, said the swarm, or cluster, of earthquakes began with a 3.2 quake on Jan. 30.

Arabasz said there was a 3.9 quake Tuesday and a 4.3 quake at 4:04 a.m. Wednesday.

"I would say that the 5.5 earthquake would be the main shock of this series," Person said.

The area of highest earthquake activity in eastern Idaho is known as the Intermountain Seismic Belt. The zone encompasses an area from Utah's Wasatch Front north to Jackson and includes Malad, Preston, Soda Springs and Gray's Lake.

While tremors in this area can sometimes be felt in Blackfoot, Idaho Falls and Pocatello, it's unlikely they will cause major damage in those towns, said Paul Link, a geology professor at Idaho State University. No major fault underlies the Snake River Plain.

Link said it's just as likely residents of Idaho Falls will feel tremors from quakes in the Lemhi or Lost River valleys, or the Hebgen Lake area of Montana.

Queer quakes

Geophysicist says swarm of aftershocks unusual

Associated Press

AFTON, Wyo. — Two earthquakes that shook western Wyoming on Thursday appear to have released an unusual amount of energy, according to a geophysicist.

Robert Smith, a geophysicist from the University of Utah, said the earthquakes measured at 4.5 and 5.5 on the Richter Scale were followed by an unusually high number of aftershocks.

"We've had, by 4 p.m. (Thursday), 30 aftershocks of 3.5 and larger and that means earthquakes that are capable of being felt," he said. "For a magnitude of 5.5 or so, we should only have two or three (aftershocks) in that period of time. So it's a particularly energetic earthquake and it's releasing a lot of energy ... and that's really unusual."

While the National Earthquake Information Center in Golden, Colo., said the magnitude of the second earthquake was 5.5, seismologists at Harvard University, the U.S. Geolog-

ical Survey and the University of California at Berkeley said the second quake was closer to 5.8 or 5.9 in magnitude.

The earthquakes caused no serious injuries and little damage to structures in western Wyoming, although a state Game and Fish Department spokesman said a fish hatchery suffered extensive damage.

Smith was in the Star Valley on Thursday to study the earthquakes centered in Idaho's Caribou National Forest. He said the quakes — 12 miles northwest of Afton and 25 miles northeast of Soda Springs — appeared to occur on a fault that has not been mapped in the past.

"There's no mapped structure we can put our fingers on now," he said. "It's relatively remote. There's not a lot of mapping here, but it's certainly not a regular fault structure."

See QUAKES, Page A3

From Page A1

Geologists are puzzled because the aftershocks continued for more than 12 hours after the main earthquakes, Smith said.

"The decay rate should have been much smaller and it apparently has not slowed down," he said. "It is an unusual circumstance."

One aftershock of 5.2 occurred at 7:42 p.m. Thursday, the University of Utah Seismograph Stations reported.

The aftershock was felt as far away as Salt Lake City.

A Caribou County dispatcher at Soda Springs said about a half dozen people called after the evening aftershock. There were no reports of injury or damage.

Seismologists said Thursday's earthquakes might have been the culmination of a swarm of quakes that began Monday in the Caribou National Forest.

Afton resident Jim Gallagher said his dog seemed to notice the earlier earthquakes.

"I noticed my dog was kind of in hiding (Wednesday)," he said. "(Thursday) morning, when it was going on, he was in a very protective mood over the kids, like he was going to get something and he wasn't sure what it was."

Meanwhile, state Game and Fish Department officials were studying damage to the Auburn Fish Hatchery in Idaho.

The 53-year-old structure log in Caribou National Forest is managed jointly by Wyoming and Idaho game officials and is used to raise cutthroat and lake trout for planting in area lakes and rivers.

Wyoming Game and Fish Department spokesman Larry Kruckenberg said the earthquakes left the building's roof and walls sagging. However, Kruckenberg said the concrete holding tanks for the fish were undamaged.

Fish in the holding tanks, which are outside of the building, were left in the tanks, Kruckenberg said, while eggs kept inside the building were moved outside.

But most structures in the area of the quakes escaped major damage, said Lincoln County Undersheriff Mike Hansen.

"We made a pretty thorough sweep of the area," he said. "I talked to the people (closest to the epicenter) and they are doing fine. The main thing was they had a collection of antique bottles and jars ... that fell off of shelves."

Afton did not even lose power after the quakes, Hansen said.

"We feel very fortunate," he said.

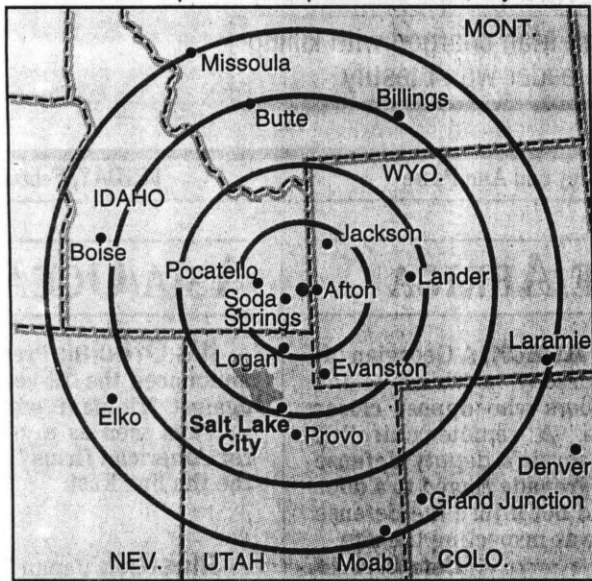
But the earthquakes did prompt a number of calls from Lincoln County residents, Hansen said.

"We were just flat inundated with calls," he said. "We keep a telephone log and by 8 a.m., we had 10 pages filled."

Quake 94

Earthquake Epicenter

An earthquake near the Idaho-Wyoming border was felt as far south as Moab. One injury was reported when a flower pot fell on a person in Afton, Wyo.



The Salt Lake Tribune

Temblor Rocks and Rolls Through Utah's Geology

By Lee Siegel
THE SALT LAKE TRIBUNE

2-4 Trib

A strong earthquake in Idaho shook a wide area of northern Utah because energy was carried through solid rock in mountain ranges, then amplified by loose sediments under Wasatch Front valleys.

The quake at 2:05 a.m. Thursday measured magnitude 5.5 to 5.9, depending on the scale used, but caused only one reported injury and light damage. University of Utah seismologists warned there was a 5 percent to 6 percent chance of a stronger jolt within a few days.

The tremor caused surprisingly strong rattling in Salt Lake City, 135 miles southwest of the epicenter. It was felt in a wide area of Idaho and Wyoming, as far south as Moab, and even in Grand Junction, Colo., 300 miles from the epicenter.

A hefty aftershock measuring 5.2 also was felt in Salt Lake City at 7:42 p.m. Thursday.

Scientists said the widespread rumbling in Utah provides more evidence that disastrous shaking will result

■ See A-7, Column 1

Continued from A-1

when a much stronger quake someday ruptures Utah's Wasatch Fault, which passes under the state's biggest cities.

"Think about this being 1,000 times bigger and 100 miles closer," said M. Lee Allison, director of the Utah Geological Survey. "The impact on this state and metropolitan area is going to be devastating unless we really start working harder to prepare for it."

The quake set off numerous burglar alarms in the Salt Lake Valley, prompted all Salt Lake City fire stations to go on alert, caused one false report of building damage, and overwhelmed the Salt Lake City Dispatch Center with calls from concerned residents, said city Fire Marshal Ren Egbert.

"If there had been calls reporting damage or injuries, they would have had a hard time getting through because of the calls seeking information," Egbert said. He urged citizens to call 911 only to report emergencies, not to get information.

The jolt was centered in a remote area near Idaho's Webster Range and Star Valley, and happened on a known fault that last ruptured about 4,500 years ago, the U.S. Geological Survey (USGS) said.

The epicenter was 24 miles east-northeast of Soda Springs, Idaho, and 12 miles west of Afton, Wyo., and was part of a swarm of smaller quakes that started Sunday, said Walter J. Arabasz, director of the University of Utah Seismograph Stations.

The only reported injury was a Wyoming resident hit on the head by a falling flower pot, according to The Associated Press.

The USGS reported some cracked foundations and plaster walls and other minor to moderate damage in the epicentral area. Afton-area residents also reported some broken windows, dishes and glasses falling from shelves, and mirrors being thrown from walls.

One home reportedly was knocked off its foundation in Auburn, Wyo., but that could not be confirmed, said Jim Pechmann, a seismologist at the U.

The U. said the swarm that started Sunday included a fore-shock measuring 4.5 to 5.0 at 12:15 a.m. Thursday.

By 4 p.m. Thursday, 30 aftershocks measuring 3.5 or stronger had been recorded, the U. said.

The USGS said the activity was unrelated to recent quakes in Oregon or the magnitude-6.6 quake that killed five dozen people in Los Angeles on Jan. 17.

Arabasz said he was surprised that so many people in the Salt Lake Valley felt the Idaho quake. Two factors explain why:

■ Ancient solid rock in the Bear River and Wasatch ranges apparently served as a conduit for the quake's seismic waves, so "the decrease of energy with distance may have been less than usual along this path," Arabasz said.

■ Pechmann said that once the seismic waves reached the Salt Lake Valley and other Wasatch Front valleys, they were amplified by soft sediments, mainly sand and gravel.

"The waves get trapped within the basin and bounce around because there is a very strong reflector of seismic waves" where soft valley sediments meet underlying, harder rock, Pechmann said.

The quake's epicenter was located in the Intermountain Seismic Belt, which stretches from southern Nevada, up through Utah's Wasatch Fault and into Idaho, Wyoming and Montana.

The Intermountain Seismic Belt is the second most seismically active region in the contiguous United States, after California. It produced Montana's 7.5 Hebgen Lake quake that killed 28 people in 1959, and the 7.3 Borah Peak, Idaho, quake that claimed two lives in 1983.

Scientists say quakes measuring 7 to 7.7 in magnitude rocked Utah's Wasatch Fault roughly every 400 years in prehistoric times, but Utahns are not fully aware of the danger because there have been no devastating jolts since settlers arrived.

Nevertheless, researchers believe such a quake is inevitable, and will be catastrophic because of the large number of unreinforced brick buildings in Wasatch Front cities.

Pechmann said: "We could have a large, damaging earthquake at any time and everybody should be prepared for it."

Allison and Pechmann said shaking from Thursday's quake bolsters the argument for stricter

building codes along the Wasatch Front.

Thursday morning's quake illustrated the confusion over quake-magnitude scales. John Minsch of the USGS National Earthquake Information Center in Golden, Colo., said the jolt measured 5.5 on the body-wave magnitude scale, 5.8 on the local-magnitude scale and 5.9 on the moment-magnitude scale.

Quick recordings of most quakes use the body-wave or surface-wave scales. Scientists consider moment magnitude to be the most accurate measure of energy released by moderate to strong quakes. Local magnitude is considered best for measuring small to moderate quakes. The so-called Richter scale is the local-magnitude scale, but quakes measured on any of the scales often are referred to as Richter magnitudes so scientists don't have to explain the difference.

Thursday's Quake Leaves More Aftershocks Than Usual in Its Wake

By Lee Siegel
THE SALT LAKE TRIBUNE

An unusual number of aftershocks bumped the Idaho-Wyoming border Friday as Utah scientists planted more earthquake monitors in the area.

Five or more aftershocks of magnitude 3.5 or stronger rattled the area Friday morning and afternoon, including one greater than 4.0 at 12:33 p.m., said Sue Nava, a seismologist at the University of Utah Seismograph Stations.

Among dozens of aftershocks Thursday, four measured 4.4 to 4.6, and another registered 5.2.

"It is more than expected," Nava said. "It is a very energetic earthquake sequence."

She said faculty and students from the U.

trudged in snow and frigid weather to place nine portable seismographs near the southeastern Idaho epicenter of the 2:05 a.m. Thursday main shock.

The tremor measured 5.5 to 5.9 in magnitude, injured one person and caused scattered damage, including a sagging roof and walls at a 53-year-old fish hatchery near Auburn, Wyo., operated jointly by Wyoming and Idaho.

Scientists named the tremor the Draney Peak earthquake because it happened under that 9,131-foot mountain.

Dozens of Utahns streamed into the Utah Geological Survey's Salt Lake City office to fill out a survey about what they felt during the strong Idaho jolt.

Some reported cracked plaster and move-

ment of heavy furniture, but most said they felt only gentle rolling from the distant tremor, state geologist Lee Allison said.

U.S. Geological Survey scientists planned to fly over southeast Idaho, southwest Wyoming and northernmost Utah looking for ground cracks, landslides or rock falls caused by the quake, spokeswoman Pat Jorgenson said.

Federal and Utah scientists disagreed over the precise location of the main quake and whether it happened on a known fault.

The USGS placed it on the Star Valley Fault, 10 miles northwest of Afton, Wyo., and 20 miles east of Soda Springs, Idaho. Nava insisted the U.'s measurements were more accurate, showing an epicenter 12 miles west of Afton and 25 miles east-northeast of Soda Springs.

Salt Lake Tribune
2/5/1994

More Hefty Aftershocks Hit Idaho, Wyoming

2-8 Trib
THE ASSOCIATED PRESS

SODA SPRINGS, Idaho — More hefty aftershocks struck the same area of the Idaho-Wyoming border where a moderate earthquake rattled portions of four states last week.

Last Thursday morning, a quake measuring 5.5 to 5.9 in magnitude, rocked the Caribou National Forest northeast of Soda Springs, Idaho, and west of Afton, Wyo. Since then, seismologists have recorded some 50 after-

shocks measuring 3.5 magnitude or greater, the largest a 5.2 shaker Thursday night.

No damage or serious injuries were reported from any of the quakes.

A 4.8 aftershock happened at 5:15 a.m. Monday; a 5.0 tremor occurred at 11:35 p.m. Sunday, according to the University of Utah Seismograph Stations.

"Nobody has really called. I guess they're getting used to it," said John Minsch, a seismologist with the National Earthquake Information Center in Golden, Colo.

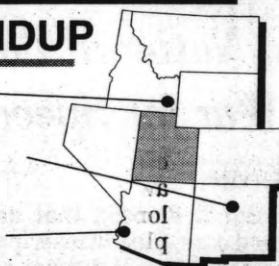
Sunday night's aftershock was felt as a short, strong jolt in Afton, but Lincoln County sheriff's dispatcher Kris Jensen said residents seemed to be taking the aftershocks in stride.

INTERMOUNTAIN ROUNDUP

IDAHO: 4.8 earthquake aftershock hits

NEW MEXICO: Plutonium level testing started in 1959

ARIZONA: Army precision parachutist killed



Salt Lake Tribune
2/8/1994

Biggest Aftershock Reminds Utahns: It's Quake Country

2-12 Trib

By Lee Siegel

THE SALT LAKE TRIBUNE

Roughly 500 detected earthquakes have shaken the Idaho-Wyoming border since a strong jolt Feb. 3. The strongest aftershock so far was Friday morning's magnitude-5.6 tremor that produced gentle rolling 135 miles away in Salt Lake City.

Much closer to the epicenter "it was — oooooooooohhh — a real rumble," said Nora Jo Taggart, a Lincoln County sheriff's dispatcher in Afton, Wyo.

"I'm ready for it to end," she said. "I'm tired of it. People don't sleep as good at night. Nerves are frayed. I don't like it."

There were no reports of injuries around Afton or across the border near Soda Springs, Idaho. Taggart said she received reports that some homes sustained cracked walls, foundations and chimneys. Lamps overturned, objects fell and pictures flew off walls, she said.

Salt Lake City-area callers deluged the University of Utah Seismograph Stations. Seismologist Sue Nava asked citizens to refrain from making such calls within two hours after a quake so scientists can get information to the news media as quickly as possible.

Friday's aftershock happened seconds before 8 a.m. and was pegged at 5.6 on the Richter scale by the U., which placed the epicenter

■ See D-2, Column 4

■ Continued from D-1

eight miles west of Afton. The U.S. Geological Survey said the quake measured 5.3 on another scale and was centered 10 miles northwest of Afton.

Pat Jorgenson, a USGS spokeswoman in Menlo Park, Calif., conceded the U.'s measurements were more accurate because the school has more seismometers close to the epicenter.

The aftershock on Friday was almost as strong as the Feb. 3 main shock that measured 5.5 to 5.9, depending on the scale used, with 5.9 considered most accurate. The quake activity started Jan. 30.

The second- and third-strongest aftershocks measured 5.5 on Feb. 3 — a quake initially estimated at 5.2 — and another tremor of 5.0 on Sunday, Nava said.

Other hefty aftershocks included jolts measuring 4.0 and 4.2 Thursday night.

There have been roughly 500 detected aftershocks so far, and by Friday morning, 60 measured 3.5 or larger, Nava said.

The number of aftershocks has been above normal, but not to an extreme. In California, an unusually active aftershock sequence sometimes suggests an even stronger quake might be on the way. Too little is known about earthquakes in the Intermountain West to make the same conclusion here, Nava said.

The quake sequence conceivably might yield a jolt measuring 6.0 or stronger in the same area, but the probability is now well below 1%, she said.

Nava said that, contrary to a false rumor, activity on the Idaho-

Wyoming border isn't directly related to Utah's Wasatch Fault, and is extremely unlikely to trigger any quakes so far away.

Nevertheless, the quakes "are gentle reminders that this is active earthquake country and we need to take steps to be prepared when this happens in the Wasatch Front," she said.

Jorgenson said the USGS was wrong in claiming the Feb. 3 main shock happened on the Star Valley Fault. She said scientists found no movement on that fault. The U. has insisted the main shock was centered on an unrecognized fault under Draney Peak in the Webster Range.

USGS geologist Robert Schuster toured towns near the recent quakes, and was amazed damage was so light, Jorgenson said. By comparison, a 5.9 quake near Klamath Falls, Ore., on Sept. 20 destroyed two or three buildings and caused numerous landslides, she added.



Star Valley Independent

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Earthquake Experiences

Page 16 and 17

Ready for next one?

Page 16 and 17

Fears and Anxieties

Page 16 and 17

Over 140 quakes tremble through Star Valley

■ Quake magnitudes range from 2.8 to 5.9. WSGS say two months of '94 quakes almost equals all of '93.

By Dan Dockstader

"They are occurring faster than we can keep up with them," John Minsch, geophysicist with the U.S. Geological Survey's National Earthquake Information Center (NEIC) told the *Independent* Thursday morning, Feb. 3. The NEIC monitors earthquakes at its Golden, CO office with the help of several seismograph regional stations and is the official reporting center for all earthquake activity in the United States.

Star Valley residents were glad to see the sun come up that morning after a night filled with earthquakes and related aftershocks.

Most notable were the two earthquakes that struck at 12:15 a.m. and 2:05 a.m. The first measured 4.5 on the Richter Scale and awakened most residents. The second, measured 5.9 and few valley residents were left undisturbed. Not only did the second large quake shake Star Valley, but Soda Springs and Montpelier residents responded to it and the National Earthquake Center reported that it was "felt quite strongly" in Grand Junction, CO, Salt Lake City and as far south as Price, UT. Its epicenter was placed at 10 miles northwest of Afton by Auburn on the Wyoming-Idaho border.

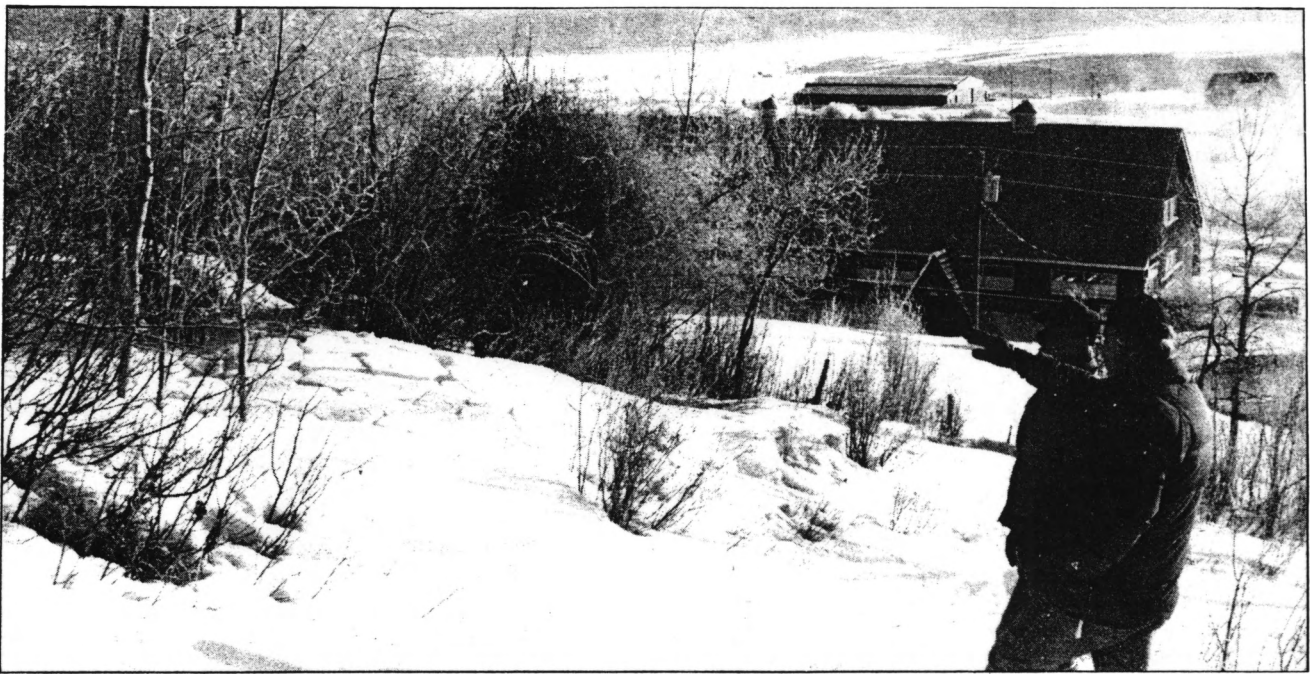
"It was fairly large so it is not unusual that it was felt in parts of four states," Minsch said.

Monday, Feb. 7, Minsch updated the report for the *Independent*. "We have located over 100 events, that's earthquakes and aftershocks," he said "They have ranged from 2.8 to three and above." He noted that the largest quake at 2:05 a.m. on Feb. 3 had originally been reported as a 5.5 on the Richter Scale but had been upgraded the following day based on additional research.

On Wednesday, Feb. 9, Minsch updated the report to over 140 earthquakes ranging from 2.7 and up in the Star Valley region since Feb. 1.

According to a report released through the office of the Wyoming State Geologist, over 42 earthquakes with magnitudes ranging from 2.7 to 5.2 occurred within 24 hours of the largest earthquake. The state geologist's office noted that 16 of those have been located in Wyoming, with the rest located just west of the Wyoming-Idaho state line. As of Feb. 4, eight earthquakes were reported to have occurred at a location just to the northwest of the largest event near Auburn.

The State Geological Survey notes that as a result of this activity, there have been almost as many earthquakes in Wyoming so far this year as in all of 1993. According to the survey, in 1993, 21 earthquakes with magnitudes of greater than 2.9 occurred in Wyoming, culminating with a magnitude 4.7 event in eastern Teton County on Dec. 28, 1993. The survey also pointed out there were more earthquakes in Wyoming in 1993 than in any single year for the previous 10 years.



Robert Schuster, U.S.G.S. branch of earthquake and landslide hazards, looks over a portion of the cracked snowpack behind the Wyoming Game and Fish hatchery in the Tygee Valley Saturday morning with Tim Curtis, hatchery assistant superintendent. Schuster toured the area Friday and Saturday.

Earthquakes leave valley with limited damage

■ USGS official tours valley area and surprised there is not more damage.

By Dan Dockstader

Limited residential and public building structural damage was reported following the series of earthquakes that shook the Star Valley region on the first week of February.

Cracked or disturbed foundations have been noted in the Tygee Valley and Crow Creek areas following the most powerful 5.9 earthquake at 2:05 a.m. Thursday, Feb. 3.

Lincoln County Undersheriff Mike Hansen noted that a Tygee residence suffered a cracked foundation and the Wyoming Game and Fish Auburn Fish Hatchery in the same valley reported that a support wall on the main building had shifted. Structural shifting was also evident on residences in the Crow Creek area.

Lincoln County School District No. 2 reported that new cracks had been discovered in several of their school buildings but it did not appear to be serious. Local contractors have already reviewed the buildings and a structural engineer will visit the schools again this week. "It's noticeable by evidence described as settling cracks, small hairline cracks usually extending vertically from the ceiling down to a door or window," Supt. Dr. Allen Lowe said. "We have not seen anything in the way of major damage

like broken windows, damaged roofs or caved in walls." He added, "A structural engineer will visit the schools this week and will make further inspection and determination regarding any special kind of repair work. We are anticipating none but to be on the safe side we have asked the engineer to come in."

Small building cracks have been observed at the Afton schools, Cokeville schools and new auditorium, Osmond Elementary and Star Valley Jr. High.

While several private wells in Star Valley reported muddied water in the days following the major earthquake on Feb. 3, Afton Utilities Supt. Lael Eddins reported that Swift Creek Intermittent Spring, Afton's municipal water source, was fine. "I just came from the geyser and it looks good to us," Eddins said on Thursday afternoon. "It is running about eight minutes and shutting off; it is just as regular as could be."

Robert Schuster with the U.S.G.S. branch of earthquake and landslide hazards toured the Star Valley and Tygee areas on Friday and Saturday mapping any cracking and sliding, however small. "I almost can't believe it -- the lack of activity, the lack of cracks and landslides," said Schuster.

Schuster made reference to an earthquake of similar magnitude on Sept. 20, 1993 at Klamath Falls, OR where extensive damage and two deaths were reported. That earthquake started with a 3.9 forshock at 8:16 p.m. and it was followed by two main shocks measuring 5.9 on the Richter Scale at 8:28 p.m.

U of U searches for fault in Draney Peak Epicenter area

■ Portable seismograph stations placed in Star Valley. Signals sent directly back to Salt Lake City on dedicated line.

By Dan Dockstader

University of Utah officials are looking for a fault in the newly designated Draney Peak Epicenter area west of Star Valley where over 130 earthquakes or related aftershocks ranging from 2.8 to 5.9 have been recorded by seismograph stations in Utah, Colorado and Idaho within the past week.

"We are in the process of deploying portable seismograph equipment around the Draney Peak Epicenter," Sue Nava, staff seismologist with the U of U seismograph stations, told the *Independent* on Tuesday. "And we presently have instrumentation in the general area of Star Valley that is sending data back to Salt Lake City."

She explained when an earth tremor occurs the portable equipment strategically located around the valley sends a radio signal to a special receiver just installed at the Greys River Ranger District Office in

Afton. Information received at that computer based site is then immediately transmitted to the U of U seismographs office on a dedicated telephone line.

Using that information seismologists hope to locate the fault that has resulted in the repeated earthquakes that started in the Star Valley area on Feb. 1 and have continued to date. Similar portable equipment has been installed in the Soda Springs and Georgetown areas.

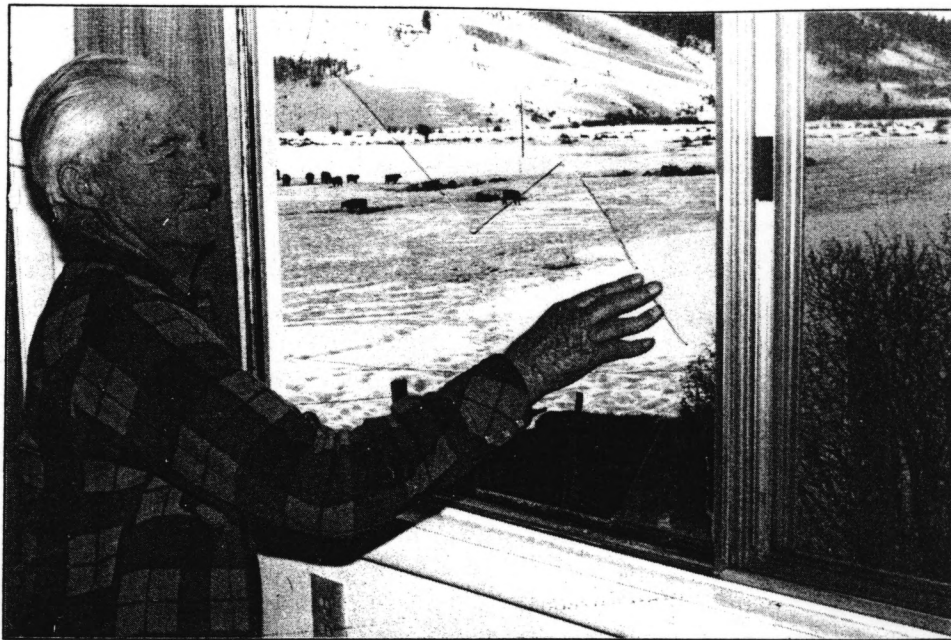
Nava noted that previously existing permanent seismograph stations at Bear Lake and Alpine provide information about epicenter locations, but by placing the new equipment in the region additional data will become available on the depth of the earthquakes. This combined data should help researchers locate the fault causing the earthquakes.

"Everyone would like to know what fault this is on," Nava said. "Because we have had an earthquake there is a fault. If it is [related to] the Star Valley fault or an unnamed buried fault we can't say at this time."

Geologists have mapped the Star Valley fault which runs along the east mountains between Alpine and Smoot. It is visible above ground in many locations along the base of the eastern hills.



The National Earthquake Information Center told the *Independent* that it is not uncommon for an earthquake with a magnitude of 5.9 on the Richter Scale to be felt in parts of four states. The NEIC noted that the 2:05 a.m. earthquake on Feb. 3, which originated by Auburn in the Draney Peak Epicenter area, was felt in Grand Junction, CO and Price UT.



Harvey Kennington of Crow Creek looks at a window broken by the largest earthquake.

Earthquakes felt strongly in Tygee and Crow Creek

By Dan Dockstader

The 5.9 earthquake that rumbled through Star Valley during the early morning hours of Feb. 3 left few people undisturbed.

The major force of the quake appeared to be felt most on the west side of the valley, and in the Tygee area and southwest in the Crow Creek and Spring Creek areas.

At the Harvey Kennington residence in Crow Creek a window was broken on the back of the house, dishes fell from cabinets and several bottles of fruit broke in the basement. "The glass was the worst," Kennington reflected. "It broke a lot of glass dishes."

At the Lyman Harmon residence in Spring Creek, Anita Harmon reported that important athletic and cutter race trophies were broken when they fell from shelves, pantries were dumped out, bookshelves were shook right out of their brackets and

water was rocked out of toilet tanks. "We lost our power and we could still hear things crashing in the house [during the earthquake]," Anita recalled.

At the Wyoming Game and Fish Auburn Fish Hatchery in Tygee a large building constructed in 1940s suffered damage in the main series of earthquakes. The largest earthquake offered no warning when it struck the hatchery area. "I was in the house and there was just a real sharp sudden jolt," said Ralph Bonner, hatchery superintendent. "There was no warning; it was just like a truck ran into the house."

Bonner noted that later quakes in the week provided some initial warnings with small waves.

The main hatchery building will remain closed to the public until all of the structural engineering studies are complete.

Media converge on Star Valley

In the wake of the Northridge Earthquake in southern California where people were killed and buildings collapsed amidst an earthquake with a 6.6 rating on the Richter Scale, regional media swarmed into Star Valley

Thursday following the 2:05 a.m., 5.9 quake.

Lincoln County Undersheriff Mike Hansen said the CBS, NBC and ABC affiliates from Salt Lake City and southeast Idaho all had television crews in the valley.

He noted that the Salt Lake stations brought satellite television trucks and channel five, KSL, toured the area in their helicopter.

In addition, Hansen said he fielded interviews from media in Denver, Grand Junction,

Casper, Riverton, Jackson and Kemmerer.

"There was an enormous response from the large media sources," said Hansen. "In my opinion they came because of the attention caused by the California earthquake."

Local earthquake activity is declining this week

As of Wednesday, Feb. 9, at 3 p.m. the U.S.G. S. National Earthquake Information Center in Golden, CO reported that only one aftershock with a magnitude of 2.7 on the Richter Scale had been recorded in the past 24-hour period in the Star Valley area.

John Minsch, geophysicist, agreed that the number of quakes appeared to be diminishing but he declined to speculate on what that meant. He recalled that at one time during the past week there were no quakes recorded for a 12-hour period and then a 4.8 aftershock was recorded.

Sue Nava, staff seismologist at the University of Utah Seismograph Stations in Salt Lake City, said on Tuesday the earthquakes in the Star Valley area are "decaying" and there are "fewer earthquakes" but she pointed out that there could still be a possibility of more occurring.



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The University of Utah Seismograph Stations staff sets up one of 10 portable seismograph stations in the Star Valley area Saturday morning following the series of earthquakes that struck the area in the past two weeks. Doug Miller (left), graduate student and Ken Whipp, seismograph technician, install the equipment on a site overlooking the Tygee Valley and Draney Peak area. When an earthquake occurs a signal is transmitted back to the Greys River Ranger District Office in Afton and then to the U of U in Salt Lake City on a dedicated telephone line.

Independent Photo/Dan Dockstader



Ken Whipp (left) and Doug Miller place seismometers on the ground to record earth movement.

U of U seismologist fields Star Valley's earthquake questions

■ Queries cover increase earthquake activity and aftershocks to differences between the jolts and waves.

By Dan Dockstader

With earthquakes still fresh on the minds of many Star Valley residents, over 200 people gathered in the high school auditorium Tuesday night to hear a presentation and ask questions of Sue Nava, senior staff seismologist with the University of Utah.

At the invitation of Lincoln County School District No. 2, the officials with the U of U's Seismograph Stations gave presentations at the valley's elementary schools throughout the day and concluded with the evening program at the high school.

The following is a summary of questions fielded by Nava and her responses: (Please see pages 10-11 for additional earthquake information.)

Why are we having the earthquakes all of a sudden? You have always had them here, but not in most of your living history. Reference was made to the June 12, 1930 Grover earthquake with a magnitude of 5.8.

Are we having more earthquakes than we should? Not more than normal this is an average sequence. But a 5.9 is a large earthquake and you are going to have a lot of aftershocks. You are having the normal amount of aftershocks for an earthquake of this size. You are on the downhill side and have been for quite a few days. But it would not be unusual to have a magnitude five within six months [of the mainshock].

Will there be larger earthquakes soon? Statistically there is a six percent chance of a large quake happening in five days after a 5.9. You never say never in the earthquake business but it is highly unlikely.

Are the earthquakes related to the Star Valley fault [on the east side]? My intuition tells me it is not the Star Valley fault but we haven't proven that yet. We know it is on a fault. We need to analyze the data. It could take many months to determine or even a year. It's a long tedious process to analyze all of the information.

Has the ground settled or raised with these earthquakes? That information is not available because there has been no extensive survey work completed prior to the earthquakes.

Has there been any surface faulting? Generally that only occurs with a 6.5 magnitude earthquake but there could be some under the surface of the snow.

Do the aftershocks release pressure? In a general sense that is true. However, an aftershock is a readjustment of rock that has already been displaced.

Is there a percentage formula for figuring damage around the epicenter area? There is no hard fast formula but generally there is no severe damage in the areas over 50 miles away from the epicenter. It varies depending on geologic conditions and building types.

Continued on page 10

Continued from page 1

Why is there very little damage? You are not as densely populated as southern California. There are not many buildings and freeways to damage. You are fortunate to live in a rural area. Damage from a 5.9 in Salt Lake City would have been much higher.

Could this effect water springs? Yes, it could reduce or increase the flow and muddy the water.

Why are there different feelings with each quake? There are two main types of earthquake waves. The P-wave comes up from the bottom and is a sharp jolt generally felt close to the epicenter. The S-wave is generally felt as a ripple effect.

What about the noise? The noise you all hear is a sound wave. When it comes out of the earth it moves the air. You are hearing the wave exiting the earth.

Why was it felt so far south of Star Valley? We really don't understand all that goes on in an earthquake but it could be that the Wasatch Mountains acted as a conduit for the waves.

Does the magnitude change the further away you are from the epicenter? The magnitude of the earthquake is the same wherever it is felt and does not vary with distance.

Why will one house feel an earthquake more than another? It depends on the construction of the home and the soil it is located on. Also, the homes are spread out here so it may be possible for occupants of one to feel the earthquake and another won't feel it.

When you recorded the foreshocks prior to the main earthquake, could you have predicted anything bigger coming? We cannot predict earthquakes. Our seismograph network is not funded to cover this area. The U of U station has the responsibility of monitoring the state of Utah and Yellowstone Park.

Is anyone responsible for monitoring this area? No. We suggest calling your congressman or state-level representatives in order to receive funding to be a part of seismograph network. Wyoming does not have an earthquake monitoring process.

Why is the U of U covering this earthquake now? The U.S.G.S. has allotted \$10,000 to monitor and do a study on this series of earthquakes related to the Draney Peak Epicenter.

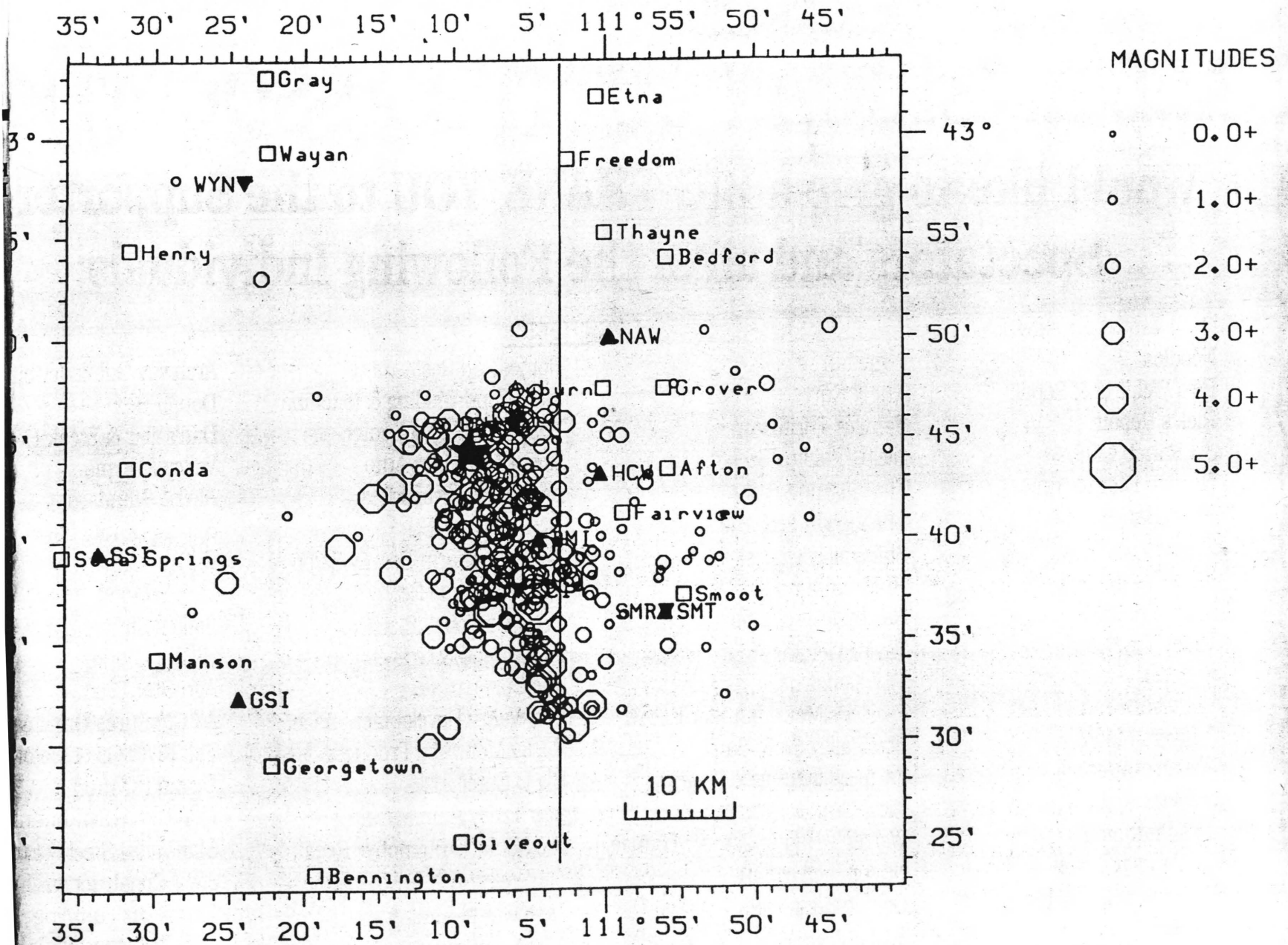
Why are the portable seismograph stations being placed in the valley? We will better understand the depth of the earthquakes, what fault it is on and what is expected in the future.

Where are you putting the portable monitors? We want them as close as possible to the activity. They are placed on the west side of the valley, on the west hills and in the Crow Creek and Tygee Valley areas.

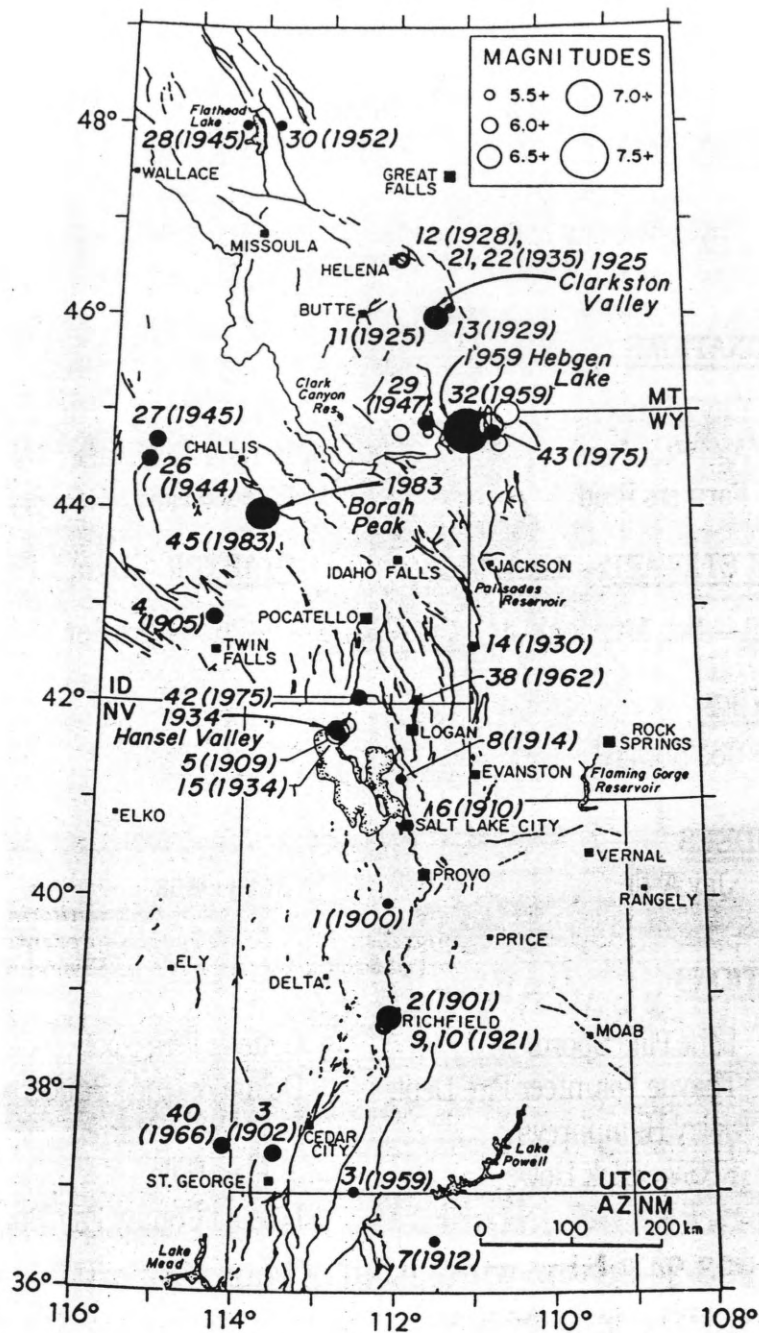
What about the rumors of magmatic or volcanic activity in the area? There is no truth to that rumor.

What about the earthquakes timing? Earthquakes don't care about the time of day, weather or the season.

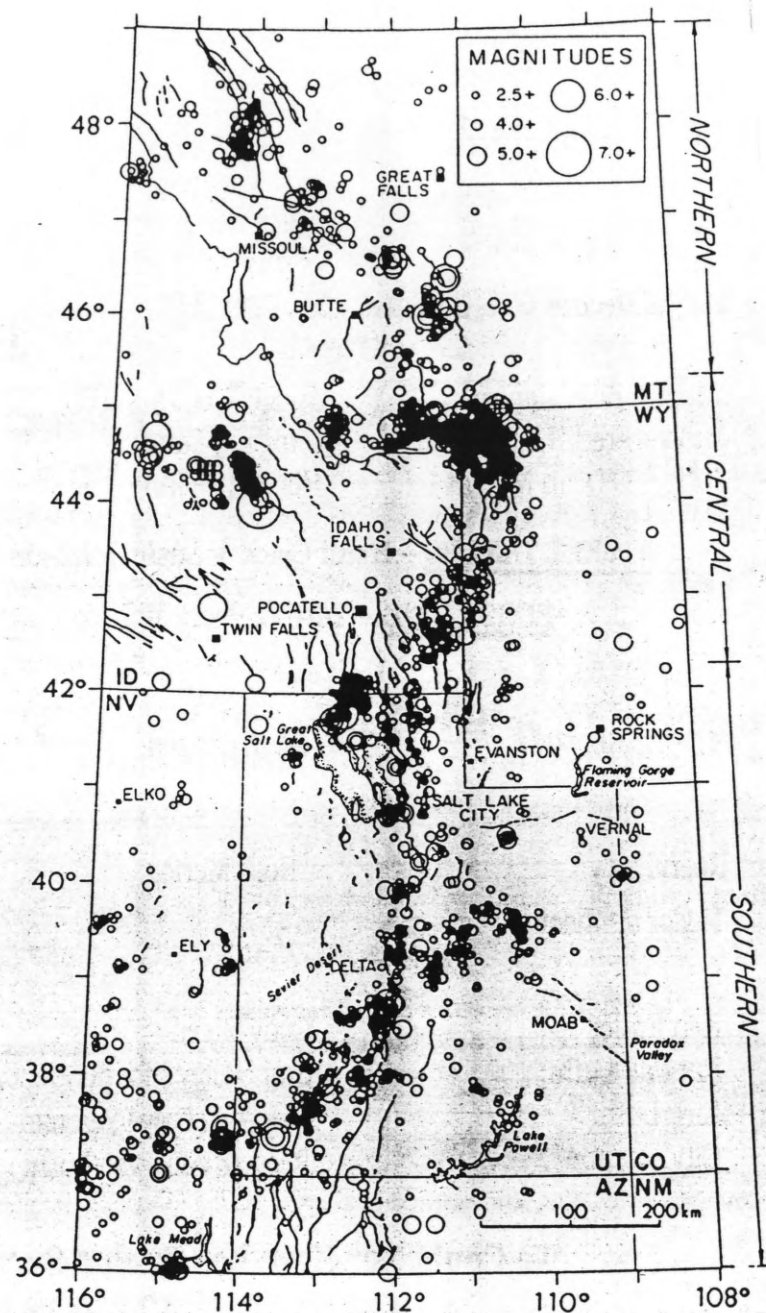
DRANEY PEAK AFTERSHOCK SEQUENCE



The above chart lists the epicenter for the main 5.9 earthquake west of Afton at 2:05 a.m. Thursday, Feb. 3, with a star. The accompanying aftershock's epicenters that occurred until 12 noon Saturday, Feb. 5, are noted with circles.



Earthquakes recorded in the Intermountain Seismic Belt between 1900 and 1985.



Historical listing of Intermountain earthquakes and magnitude listing.

Summary for Feb. 10-16

By Dan Dockstader

Small aftershocks to the Feb. 3 earthquake west of Star Valley that measured 5.9 on the Richter Scale continued to tremble through the valley as late as Wednesday, Feb. 16. The University of Utah Seismograph Stations recorded a 3.7 aftershock at 10:23 a.m. Feb. 16 and then as 2 p.m. Wednesday, Feb. 16, the seismograph stations had not recorded any significant aftershocks.

A 3.8 magnitude aftershock hit the area at 8:59 p.m. Monday, Feb. 14.

The U of U Seismograph Stations reported that the strongest aftershock since the mainshock hit the area at 7:59 a.m. Feb. 11. It had a magnitude of 5.6. The epicenter of that quake was located eight miles west of Afton, close to the epicenter of the Feb. 3 mainshock. The Lincoln County Sheriff's Office said there were reports of some hair-line cracks at residences in Fairview and Grover. It was felt in Kemmerer, Rock Springs and Salt Lake City.

The university noted that two sizable aftershocks also occurred Feb. 10. The first came at 7:20 p.m. and had a magnitude of 4.0 and the second was at 9:24 p.m. and had a magnitude of 4.1. Both of these aftershocks were located nine miles northwest of Afton.

In related news, Lincoln County School District No. 2 Supt. of Schools Allen Lowe reported that the schools have been inspected by a structural engineer and declared safe.

Chris Wood, geophysicist with the Bureau of Reclamation, reported that no damage has occurred at the Palisades Dam as a result of the Star Valley area earthquakes. He noted that monitoring equipment is in place at the dam, which is engineered and designed according to earthquake specifications.

Earthquakes continue in valley

■ April earthquake count is at 13 as of Wednesday, April 13.

By Dan Dockstader

The April earthquake count in the Star Valley region stands at 13, according to the latest report released from The Geological Survey of Wyoming.

As of press time Wednesday afternoon, April 13, the most notable recent earthquake occurred Sunday, April 10. It had a magnitude of 4.6 and was located just west of the state line based on reports from the U.S. Geological Survey's National Earthquake Information Center and the University of Utah Seismograph Stations.

The earthquake summary for April is as follows:

>April 2, four earthquakes with magnitudes ranging from 2.8 to 3.8.

>April 4, three earthquakes with magnitudes ranging from 2.8 to 3.0.

>April 7, four earthquakes were felt with magnitudes ranging from 2.9 to 4.8.

The Geological Survey noted that the magnitude 4.8 earthquake has been the largest recorded to date in April. It was located approximately 12 miles

southwest of Afton and was felt as far south as Salt Lake City.

>April 8, a magnitude 3.9 earthquake also occurred southwest of Afton.

Lincoln County Sheriff Lynn Clark said there have been no reports of significant damage from any of the April earthquakes.

The survey notes that additional smaller earthquakes have been recorded, but generally not felt by residents in the area.

All earthquake data for April 1994 was obtained from the U.S. Geological Survey's National Earthquake Information Center in Golden, CO, the U.S. Bureau of Reclamation in Denver, CO and the University of Utah's Seismograph Stations in Stations in Salt Lake City.

Jim Case, staff geologist-geologic hazards with the GSW, explained that earthquake activity appeared to be moving southwest of Afton but it was too early to know what that means. He reiterated the wisdom of always being prepared.

Chuck Young, Lincoln County Emergency Management Coordinator, who met with Case this week also emphasized preparedness.

Conn Astle, assistant county emergency manager, said a general emergency preparedness booth will be included at the Star Valley Community Health Fair, April 30.

Geological Survey releases updated April earthquake report

■ Most epicenters located in southeast Idaho but quakes can still be felt in Star Valley.

By Dan Dockstader

The Geological Survey of Wyoming has updated their earthquake count for the Star Valley area for the month of April.

Jim Case, staff geologist-geologic hazards, explained that further study of the information from the U.S.G.S and the University of Utah has provided additional information to a listing of earthquakes released earlier in mid-April. The latest report also

includes new listings for the latter part of April.

Again, Case emphasized that the list will not contain all of the earthquakes recorded, but only those with a magnitude large enough to be felt in the Star Valley region.

The earthquake summary for April is as follows:

>April 2, Saturday, four earthquakes with magnitudes ranging from 2.8 to 3.8.

>April 4, Monday, three earthquakes with magnitudes ranging from 2.7 to 3.0.

>April 7, Thursday, six earthquakes with magnitudes ranging from 2.7 to 4.8.

>April 8, Friday, five earthquakes ranging from 3.2 to 4.1.

>April 9, Saturday, one earthquake with a 3.8 magnitude.

>April 10, Sunday, one earthquake with a 4.6 magnitude.

Continued on page 3

Continued from page 1

>April 11, Monday, one earthquake with a 2.8 magnitude.

>April 13, Wednesday, one earthquake with a 2.6 magnitude.

>April 15, Friday, one earthquake with a 3.7 magnitude.

>April 29, Friday, three earthquakes with magnitudes ranging from 2.6 to 3.4.

"Most of the earthquakes [during April] were located in southeastern Idaho," Case reported to the *Independent* in a telephone interview late Tuesday. He added, "But they

were of a magnitude that allowed them to be felt in Star Valley."

He also noted that a few of the earthquake epicenters had been traced to western Wyoming.

Case concluded that additional information will become available as the University of Utah data base is studied on the series of earthquakes that rumbled through Star Valley throughout the winter and spring. The mainshock for the series was a magnitude 5.9 recorded on Feb. 3.



Afton shaken by quakes

AFTON (AP) — Moderate earthquakes near Afton left residents of western Wyoming shaken this morning, but officials said there were no reports of serious injuries or major damage.

Mike Michalek, a spokesman for the Wyoming Emergency Management Administration, said his office had been told that the earthquakes that occurred at about 12:15 a.m. and 2:06 a.m. caused no major problems.

"Right now I don't think we're looking at any real major property or health concerns," he said. "It's just that people have been shocked by this. We don't expect this in Wyoming."

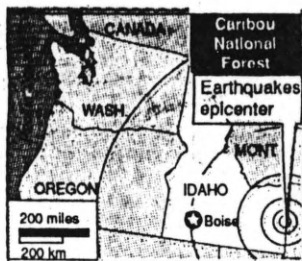
The National Earthquake Information Center in Golden, Colo., reported the first of the two earthquakes, centered about 10 miles northwest of Afton, measured 4.5 on the Richter Scale, while the second measured 5.5.

While considered moderate earthquakes, the two may be the strongest on record for the region, said Waverly Person, director of the Earthquake Information Center.

The earthquakes shook items off of shelves in Afton near the Idaho border and were felt as far south as Rock Springs, Grand Junction, Colo. and Provo, Utah.

Person said the two earthquakes were the apparent culmination of a series of earthquakes that began with one measured at 3.2 on Jan. 30. All of the earthquakes have been centered in Idaho's Caribou National Forest.

Chris Wood, with the U.S. Bureau of Reclamation, said smaller earthquakes were also



AP/Wm. J. Castello

felt Tuesday and Wednesday.

Jim Gallagher, manager of the 7-Eleven store in Afton, said he had heard of no major damage from the earthquake.

"It broke a few dishes," he said. "We're in good shape."

Gallagher said he was awakened by the second earthquake.

Michalek said earthquake preparedness information has been sent by fax to law enforcement and emergency management officials in Lincoln County to advise residents on what to look at in the aftermath of the earthquakes.

"We want to give a heads-up to individuals on what they have to do, double-check their gas mains and water mains and insure the structural integrity of their homes," he said.

Law enforcement officials in Afton could not be immediately reached today because phone circuits were busy.

Earthquakes are common to the north of Afton in the Yellowstone National Park area and seismologists have said the Jackson Hole area is overdue for a major earthquake.



Wyoming State Tribune

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Friday, February 4, 1994

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Earthquakes behaving unusually: Smith

AFTON (AP) — Two earthquakes that shook western Wyoming on Thursday appear to have released an unusual amount of energy, according to a geophysicist.

Robert Smith, a geophysicist from the University of Utah, said the earthquakes measured at 4.5 and 5.5 on the Richter Scale were followed by an unusually high number of aftershocks.

"We've had, by 4 p.m. (Thursday), 30 aftershocks of 3.5 and larger and that means earthquakes that are capable of being felt," he said. "For a magnitude of 5.5 or so, we should only have two or three (aftershocks) in that period of time. So it's a particularly energetic earthquake and it's releasing a lot of energy ... and that's really unusual."

While the National Earthquake Information Center in Golden, Colo., said the magnitude of the second earthquake was 5.5, seismologists at Harvard University, the U.S. Geological Survey and

Callers jam 911 lines

SALT LAKE CITY (AP) — If you feel the ground shake, but aren't injured, don't call the 911 emergency number and ask: "Was that an earthquake?"

Emergency officials issued that reminder Thursday after the strongest of two quakes near the Idaho-Wyoming border woke up Salt Lake residents, hundreds of whom promptly dialed 911.

"They all wanted to know if we just had an earthquake,"

said a Salt Lake police dispatcher. "If someone would have really needed help it would have been ugly. They couldn't have gotten through."

Salt Lake City Fire Battalion Chief Ren Egbert said that after the 5.5-magnitude quake at 2:06 a.m. caused buildings to sway in Salt Lake City, emergency lines lit up, even though there was no damage or injuries.

"The 911 telephone number is for emergency use only, not for information," Egbert said.

the University of California at Berkeley said the second quake was closer to 5.8 or 5.9 in magnitude.

The earthquakes caused no serious injuries and little damage to structures in western Wyom-

ing, although a state Game and Fish Department spokesman said a fish hatchery suffered extensive damage.

Smith was in Star Valley on Thursday to study the earthquakes centered in Idaho's Carli-

bou National Forest. He said the quakes appeared to occur on a fault that has not been mapped in the past.

"There's no mapped structure we can put our fingers on now," he said. "It's relatively remote. There's not a lot of mapping here, but it's certainly not a regular fault structure."

Geologists are puzzled by the fact the aftershocks continued for more than 12 hours after the main earthquakes, Smith said.

One aftershock of 5.2 occurred at 7:42 p.m. Thursday, the University of Utah Seismograph Stations reported.

Earthquakes are common north of Afton in the Yellowstone National Park area and geologists have said the Jackson Hole valley is long overdue for a major earthquake.

An earthquake in Yellowstone's Hebgen Lake area in August 1959 registered 7.1 on the Richter Scale and resulted in 28 deaths.



Wyoming State Tribune

Found

Monday, February 7, 1994

Cheney

Aftershock strikes border area again

SODA SPRINGS, Idaho (AP) — A strong aftershock struck the same area of the Idaho-Wyoming border late Sunday night where a moderate earthquake rattled portions of four states last week.

Last Thursday morning, a quake measuring 5.8 to 5.9 magnitude on the Richter scale, rocked the Caribou National Forest 25 miles northeast of Soda Springs, Idaho, and 10 miles northwest of Afton.

Since then, seismologists have recorded some 50 aftershocks measuring 3.5 magnitude or greater, the largest a 5.2 shaker Thursday night.

No damage or serious injuries were reported from any of the quakes, including Sunday night's 4.8 magnitude aftershock, which was recorded at 11:36 p.m. MST.

"Nobody has really called. I guess they're getting used to it," said John Minsch, a seismologist with the National Earthquake Information Center in Golden, Colo.

Calls to the University of Utah Seismograph Stations early this morning went unanswered.

However, there were no reports of the quake being felt much beyond its epicenter.

It was felt as a short, strong jolt in Afton, but Lincoln County sheriff's dispatcher Kris Jensen said the area's residents seemed to be taking the aftershock in stride.

"It wasn't so strong that anybody would be thrown out of bed with it," Jensen said. "I bet it only lasted five seconds at the most, but it was pretty strong."

Wyoming State Tribune
2/7/1994

4.5 aftershock hits Idaho-Wyoming border

SODA SPRINGS, Idaho (AP) — Another earthquake has struck the Idaho-Wyoming border following last week's 5.9-magnitude temblor and several strong aftershocks.

The moderate quake, measuring 4.5 on the Richter scale, was recorded at about 6 p.m. MST Wednesday, said U.S. Geological Survey spokeswoman Pat Jorge-son.

There were reports the quake — centered 40 miles north-northeast of Montpelier, Idaho — was felt by residents in Afton, she said.

"This is the latest in a series of moderate earthquakes that followed the one last week," Jorge-son said.

The earthquake last week that measured 5.9 magnitude on the

Richter scale rocked the Caribou National Forest 25 miles northeast of Soda Springs, Idaho, and 10 miles northwest of Afton.

Since then, seismologists have recorded some 50 aftershocks measuring 3.5 magnitude or greater, the largest a 5.2 shaker Thursday night.

No damage or serious injuries were reported from any of the aftershocks.

Wyoming State Tribune
2/10/1994



Aftershock of 5.6 hits Idaho-Wyoming border

SODA SPRINGS, Idaho (AP) — An earthquake measuring 5.6 on the Richter scale, the latest in a series of shocks since Jan. 30, struck this morning on the Idaho-Wyoming border, causing minor damage near the epicenter.

Seismologists at the University of Utah Seismograph Stations in Salt Lake City said this morning's aftershock was the largest to date following the 5.9 main shock on Feb. 3.

The tremor at about 8 a.m. MST was centered 8 miles west of Afton, and 25 miles east and northeast of Soda Springs in the Caribou National Forest, accord-

ing to the University of Utah seismologists.

"At one residence, the step was pulled away from the building, the door moved and we've had cracks in one of our deputies' houses — he's over there now," said Nora Jo Taggart, dispatcher for the Lincoln County sheriff in Afton.

"Things fall off walls, lamps tip over. We've been swamped (with phone calls), though. That was a good one," she said.

The quake was felt by residents as much as 130 miles away in Salt Lake City and Park City, Utah, and in Rock Springs and

'This one was really strong and it was really loud ... it's a roaring under your feet like the earth's going to open up'

—Nora Jo Taggart,
Lincoln County sheriff's dispatcher

Green River, about 180 miles southeast of Afton.

The temblor was the latest in a cluster of quakes that have occurred in the area almost daily since Jan. 30, beginning with one of 3.2 magnitude. On Feb. 3, an earthquake of 5.9-magnitude, the

largest in the series, was felt widely in a four-state area of the Intermountain West.

On Wednesday, a moderate quake measuring 4.5 on the Richter scale occurred in the same area.

Chuck Young, Lincoln County

emergency management coordinator, said there were unconfirmed reports of broken windows.

"We have had reports of people feeling the quake in Kemmerer," the county seat about 100 miles southeast of Afton, he said.

There were similar reports from the Star Valley area around Afton, where the dispatch center was being "inundated with phone calls," he said.

"This one was really strong and it was really loud," Taggart said in Afton. "The floor in here just shook. It was really a loud roar, the loudest roar I've heard,

and I've had other people call in and say that."

Taggart said there were no reports of injuries or power outages and schools weren't affected.

"It's eerie. It's a roaring under your feet like the earth's going to open up. Like thunder, but it's different," she said.

Taggart said today's quake felt stronger than the 5.9 shaking, although the Richter reading did not bear that out.

"This one was noisier than the one last week; it felt a lot bigger to me" and to callers, she said.

Afton's on edge with aftershock

AFTON (AP) — Another in a seemingly endless series of earthquakes shook western Wyoming Friday morning. And again, the quake, while of significant magnitude, did little damage.

Unless you consider the residents' nerves, which are fraying like an old rope.

"People in California probably take this with a grain of salt and don't pay attention to it. They get them all the time," said Jerry Mower, assistant principal and athletic director for Star Valley High School at Afton. "But for us, it's unnerving."

Friday's 5.6 magnitude quake occurred about 8 a.m. MST and was one of several hundred aftershocks that have followed a 5.9 quake on Feb. 3. That main quake had been preceded by an earthquake swarm that began Jan. 30.

Since Feb. 3, more than 60 aftershocks have topped 3.5 magnitude, said University of Utah seismologist Sue Nava.

The quakes all have been centered eight miles west of Afton and 25 miles east and northeast of Soda Springs, Idaho, in the Caribou National Forest, said University of Utah seismologists.

Two sizable aftershocks rattled the area Thursday night, the first a 4.0 magnitude at 7:20 p.m., the second, a 4.1, at 9:24 p.m.

"We are hoping these damn things will start to tail off," Mower said after Friday's aftershock. "The word we have is that they are starting to tail off, but we keep getting jolts."

The shock was felt by residents as much as 130 miles away in Salt Lake City and Park City, Utah, and in Rock Springs and Green River, Wyo., about 180 miles southeast of Afton.

Chuck Young, Lincoln County emergency management coordinator, said the sheriff's dispatch center was "inundated with phone calls."

"Things fall off walls, lamps tip over. We've been swamped (with phone calls)," said dispatcher Nora Jo Taggart in Afton.

"This one was really strong and it was really loud," Taggart

said. "The floor in here just shook. It was really a loud roar, the loudest roar I've heard, and I've had other people call in and say that."

"It's eerie. It's a roaring under your feet like the earth's going to open up. Like thunder, but it's different," she said.

Taggart said Friday's quake felt stronger than the 5.9 shaking.

"This one was noisier than the one last week; it felt a lot bigger to me" and to callers, she said.

"It seems like they were starting to (get used to the quakes), and then this big one hit this morning," she said. "I think everybody's real nervous."

Elkhorn Family Restaurant manager Linda Barrus agreed.

"In fact, my day cook is wanting to go home real bad. People are feeling they want to be home with their families in case something bad does happen. I want to get my kids out of school and stay at home with them," she said.

At the Golden Spur Cafe in Afton, earthquakes are the main topic of conversation, said Betty Veitch, who runs the cafe during the day.

"They're talking about the animals that are frightened," she said. "Of course, none of the men talk about how they're frightened. But they talk about how their wives are frightened."

There were reports of minor damage in Afton, but officials in Soda Springs, 30 miles west in Idaho, had received no damage reports and only a few calls from residents startled by the quake.

Taggart said there were no reports of injuries or power outages and schools weren't affected. The only damage reported was a few cracks in houses, a step that was pulled away from a building and some unconfirmed reports of broken windows — in short, not much.

But the week of temblors is exacting its toll.

"I think the main thing is the animals not letting people sleep at night," said Veitch. "Dogs are barking. I have two small ones, and when they feel something, they'll come running and jump right up on the bed with me."

Saturday Wyoming Tribune-Eagle

CHEYENNE, WYOMING

SATURDAY, February 5, 1994

VOLUME 4, NUMBER 22

Worse quakes yet to come, official says

By PAM McCORMACK
LCCC journalism student

The tragic death and destruction from California's latest major earthquake may hold a silver lining for residents of Wyoming.

"We hope it can serve to increase awareness about our own earthquake potential," said Jim Case, head of the geologic hazards division of the Geological Survey of Wyoming.

On Feb. 3, Wyoming received its own "quake up" call.

Beginning three days before, the Western Star Valley area on the Wyoming-Idaho border began to experience a series of foreshocks with magnitudes ranging from 3.3 to 4.5 on the Richter scale. Then, at 2:05 Thursday morning, residents were jolted from bed when a magnitude 5.8 temblor ruptured.

At first, no one knew what to do. "It is common in earthquakes to have a period of confusion," Case said. "But within hours, city and county officials were on the scene helping residents deal with the situation in a proficient manner."

Aftershocks continue to hit the area as officials attempt to assess the damage caused from the unexpected quakes. To date, many homes and buildings are now known to have cracks and gaps where none were before. New cracks in the local dam have residents and officials nervous, and the Auburn fish hatchery received substantial structural

Breakdown on the Wyoming quakes

THURSDAY:

- ◆ 12:15 a.m. — First quake measures in at 4.6 on the Richter scale
- ◆ 2:06 a.m. — A quake registering magnitude 5.8 strikes
- ◆ By 4 p.m. — Thirty aftershocks measuring 3.5 or larger are recorded
- ◆ 7:42 p.m. — A 5.2 aftershock is recorded
- ◆ 8:10 p.m. — A magnitude 4.0 aftershock is recorded

damage. The power of the earthquake also woke up people in Salt Lake City, and was noticeably felt in Dubois, Green River, Jackson and northern Colorado.

Although the Star Valley earthquake was somewhat of a surprise, seismologists do expect the Teton region in western Wyoming to experience an earthquake with a possible magnitude of 7.5 sometime in the near future.

Lessening the surprise element and helping residents to prepare for earthquakes in their area are part of the geologic hazards division's job.

"We have to plan for the worst and hope for the best," Case said. "If awareness can be raised now in the state, un-

necessary loss of lives and structures can be avoided in the future."

Because seismology, the study of earthquakes, is not an exact science, seismologists can only make predictions about earthquakes. By studying the geological record and using statistical analysis, they attempt to predict where an earthquake is likely to rupture and how extensive it will be.

"Every county in Wyoming has experienced seismic activity of some kind in the last 120 years," said Case. During 1894-1897, a series of significant earthquakes jolted the Casper area with probable magnitudes of 5.5 to 6.1. In 1882, a quake with a probable magnitude of 6.5 violently shook the area between Laramie and Fort Collins, Colo.

In 1984, northern Albany County experienced a 5.5 magnitude earthquake that caused structural damage and was felt over half of the state. Within the last six months, the county has experienced three more quakes.

Statistics show the whole western portion of the state capable of earthquakes in the 7.5 magnitude range, the central portion capable of 6.7 magnitude quakes, and the eastern portion at least 3.0, magnitude quakes.

Earthquakes are a way the earth can relieve its stress. Pressure builds up by the movement of rocks within the crust. When a critical limit is reached, the rocks rupture and "snap" to a new position of equilibrium. Seismic waves then

travel at high speeds throughout the Earth. It is these waves that can cause destruction and, sometimes, death.

In Wyoming, it is particularly hard to predict what kind of seismic waves will be generated and, therefore, it is difficult to judge the potential damage Case said.

Magnitude is what the actual original force of the earthquake was at the moment it ruptured. The formula is derived using the seismic waves registered on a seismograph and then expressed on the Richter scale. Although the numbers can be lower or higher, the basic scale runs from 0 to 8.9 magnitude.

"You do not have to have an earthquake with a high magnitude for it to cause a lot of damage," Case said. He warned that just looking at the predicted magnitude does not guarantee an accurate judgment of the potential damage from an earthquake.

The recent California earthquake registered a 6.6 magnitude. But, because it lasted longer than usual and the frequencies of the seismic waves were just right, the quake caused much more damage than expected, Case said.

To help raise earthquake awareness in Wyoming, the geological hazards division has prepared earthquake awareness packages that give information about how to prepare for an earthquake and what to do when one occurs. These packages can be obtained by calling 766-2286.