Mountain spine is a quake hotspot

April 6 2009, by Richard Ingham

Scientists said a killer earthquake that struck central Italy on Monday occurred in a notorious trouble spot and warned further powerful shocks in the coming months could not be ruled out.

The pre-dawn temblor, measuring 6.2 magnitude, struck in the central Apennines, the mountainous spine that runs down Italy, around 100 kilometres (60 miles) northeast of Rome, the Italian geophysical institute said.

The historic town of L'Aquila bore the brunt of the big shake, and scores of people were dead or missing, according to rescue officials.

Roger Musson of the British Geological Survey (BGS) in Edinburgh, Scotland, said the Apennines were a hotspot for large quakes, and an event of this magnitude "is not really a surprise."

"We have this in-built psychological sense that this Earth on which we stand is fixed and immobile, then an earthquake comes along and shatters the illusion," he observed.

In the last century, five big quakes in or around Italy's trouble-prone backbone have claimed around 34,000 lives. Monday's event was the third major quake in less than 12 years in a radius of just 140 kilometres (87 miles).

Robin Lacassin, a geologist at the Institute of Physics of the Globe in Paris (IPGP), said the quake happened very close to the surface,

"practically under the town of L'Aquila."

The impact may have been somewhat amplified by a basin of sedimentary soil, which propels rather than dampens shockwaves.

"The magnitude is not huge, it's quite within the range for destructive earthquakes in the centre of Italy," he said.

"All of this region, from central Italy to Calabria in the southeast, is crisscrossed with faults" of this type, he said.

To the west of the Apennines is the European plate, and to the south is the African plate, which is moving slowly northwards, Musson explained.

To the east is the big mischief-maker, the Adria microplate, which is tugging to the northeast and is a potent trigger for quakes in both the Apennines and in the Balkans, on the other side of the Adriatic.

All this results in "complex tectonics," said John McCloskey, a professor of geophysics at the University of Ulster, Northern Ireland.

In the case of the Apennines, the problem is so-called normal faulting, in which a brittle crust being is pulled by a subterranean sideways movement, prompting the fault to rip open along an inclined angle.

The region could be hit by powerful shocks in the coming months, as the energy released by Monday's event places further stress on neighbouring faults, McCloskey feared.

"Earthquakes like this frequently trigger other earthquakes in the region. After the Umbria and Marche earthquakes there was a sequence of eight events higher than magnitude five in the following two months," he said.

He referred to two deadly quakes in September 1997, around 100 kms (60 miles) to the northwest of Monday's quake, that had a magnitude 5.6 and 6.0.

Musson said it was "quite possible" there was a structural link between the 1997 and 2009 quakes.

Seismologists have becoming increasingly interested in the concept of a domino effect after the December 26, 2004 earthquake that unleashed the Indian Ocean tsunami and was followed by other massive temblors along the same fault west of Sumatra.

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