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# Active Earth:
## The Earth's Interior Quiet? Beware of a Storm

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# Features

## Active Earth

## The Earth's Interior Quiet? Beware of a Storm

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***Editor's Note:*** *Releases dealing with technical developments in the USSR are occasionally received from the Press Office of the USSR Embassy in Canada. This article is presented here as an interesting statement about seismic monitoring and earthquake prediction in the Soviet Union. (Received 19 April 1990).*

That prediction of earthquakes remains the weakest link in geophysics was confirmed once again by the strong crustal movements in Armenia (1968) and near San Francisco (1989), both catching scientists unaware. Even such a well-organized seismological service as that in the United States predicted only a 30% earthquake probability for the area.

Traditionally, researchers have approached the mystery of how an underground storm is prepared through studying palpable tremors. And, as we now know, without any tangible results. Our laboratory, on the other had, tried to address the same problem from the opposite direction — by gaining insight into the "life" of slight interior tremors, primarily in areas with the greatest likelihood of a disastrous earthquake. Potentially dangerous zones are grouped around crustal fractures that are in a state of compression.

By observing such areas where fracture walls do not move relative to each other, we discovered the build-up of elastic energy on the periphery of the "dormant" fractures. This manifested itself in weak creakings of the crust, the sources seeming to encircle foci of future powerful shifts and being situated at a distance of some 70-80 km from the foci. The "quiet before the storm" phenomenon proved to be a good prognostic indication. The point is that accumulating elastic tensions may culminate in so-called tectonic creep, with walls of the crust blocks gradually moving relative to each other without causing any destructive waves. Our investigations in Central Asia have demonstrated that a "peaceful outcome" is recorded in five cases out of six: instruments register the tremor, which is not felt by humans. Even so, we believe that such forecasts should be taken seriously and adequate measures taken in all six instances.

Observations of crustal processes conducted over the past few years by the laboratory have suggested that the above-mentioned destructive Spitak earthquake in Armenia can be prepared by nature within five to seven years. Earlier, it was believed to take a minimum of 30 years, this giving a kind of reassurance, and no urgency to renewing seismic maps of a potentially dangerous territory. Now, it is clear that the outdated maps do not keep up with the swift processes in the crust, and therefore cannot predict seismic situations for the years ahead.

The conclusion about the need for constant monitoring of seismic processes on seismo-active territories has led Soviet scientists to propose a single seismological system for the entire country (at the current moment, it is being considered by the government). Provision is made to drastically increase the number of observing stations, while, at the same time, seriously increasing their sensitivity (as compared with the equipment currently available in the USSR). Provided with up-to-date digital equipment, the stations will be processing data in real time. Dynamic seismic zoning will substantially add to the reliable prediction of an impending disaster.