
The Swiss Seismological Service (SED)

The Swiss Seismological Service at ETH Zurich (SED) is one of the leading European research and service institutions in seismology.

The SED's main tasks are governed by a federal contract. They involve earthquake monitoring, hazard assessment, providing information to the authorities and the public, Switzerland's participation in international nuclear test ban monitoring and operation of the national seismic monitoring networks. The SED maintains a 24-hour on-duty service for earthquake monitoring.

In addition to these main tasks, the Seismological Service takes part in research and teaching at ETH Zurich.

The origins of the Swiss Seismological Service date back to the foundation of the Swiss Earthquake Commission in 1878. Thus Switzerland was the first country, even before Italy and Japan, to create a permanent official organisation to monitor earthquakes. Since 1957, the SED has been affiliated with the Institute of Geophysics of ETH Zurich.

How does the SED monitor earthquakes?

The SED operates two separate nationwide seismic monitoring networks, a highly sensitive digital seismometer network (SDSNet), and a less sensitive so-called strong-motion network. The SDSNet consists of 35 stations located on solid rock at remote locations and is designed to record ground motion well below the threshold of human perception.

The signals from these stations are transmitted continuously to the Federal Office of Information Technology and Telecommunication, from where they are forwarded to the SED in real-time.

The strong-motion network is aimed more at engineering concerns and consists of 93 stations that are designed to record mainly the stronger earthquakes. Most of the instruments are located in regions of higher seismic activity as well as in urban areas and near critical infrastructure facilities, such as the Valais, the region of Basel and Switzerland's large dams.

Explanation of technical terms

The earthquake source is a fault or fracture in the Earth's interior that can extend from a few metres to hundreds of kilometres, depending on the magnitude of the quake.

The hypocentre of an earthquake is the location on the fault where the rupture process originated.

The epicentre is the projection of the hypocentre on the surface of the Earth. With modern instrumentation, epicentral locations can be determined routinely with an accuracy of a few kilometres, whereas the exact focal depth is more difficult to determine.

The magnitude is a measure of the energy released by an earthquake. It can be calculated from the ground motion recorded by the instruments and is given in units of the so-called Richter scale. The strength of an earthquake increases exponentially with magnitude rather than linearly.

The intensity of an earthquake is based on a classification of the effects (ground shaking and damage) at the Earth's surface. In Europe, the intensity is defined according to the European Macroseismic Scale (EMS-98) with values from I to XII. Damage to buildings is observed for intensities of VI and more.

Further information:

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