Seismo@School – A Swiss-wide initiative to bring current earthquake knowledge to schools

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Summary

The Swiss National Science Foundation (SNSF) is funding a two-year project to enhance earthquake awareness in Switzerland. The project targets secondary school teachers and students (aged 12-18) offering novel educational materials and activities on earthquake related topics.

In addition, we have installed RaspberryShake seismometers at selected secondary schools, so that students can record and analyse earthquakes at their school.

Our long-term vision is a Swiss-wide seismo@school programme, featuring multilingual resources, teacher networks, regular activities, and international collaborations.

seismo@school is a crucial step in promoting earthquake preparedness and awareness among young people and ultimately contributes to a safer community. Another goal is to promote STEM subjects in Swiss secondary schools.

Figure 1. RaspberryShake seismometer deployed at Swiss secondary schools.

Collaboration with schools

At the start of our project, we conducted an online survey with teachers to identify their needs, preferences, and ideas for useful materials regarding earthquakes.

- We design and test our educational materials and activities iteratively together with the teachers to ensure that they can be effectively integrated into the school curricula.
- Teachers are familiarized with the new materials during workshops.
- We also support students in writing their matura theses, which are compulsory at Swiss secondary schools.

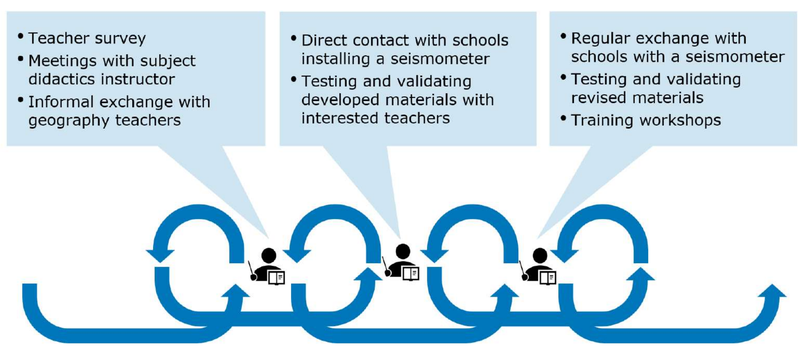


Figure 2. Iterative development of educational materials and activities in collaboration with teachers.

RaspberryShake network

We have installed 18 RaspberryShake seismometers at secondary schools throughout Switzerland, complementing 25 stations that were installed in a forerunner project. This brings the total number of stations to 43.

These sensors allow students to record and analyse local, regional and teleseismic earthquakes at their school, and deepen their understanding of various seismological concepts.

The Swiss Seismological Service (SED) at ETH Zurich has integrated the data collected from the schools into the national seismic network.

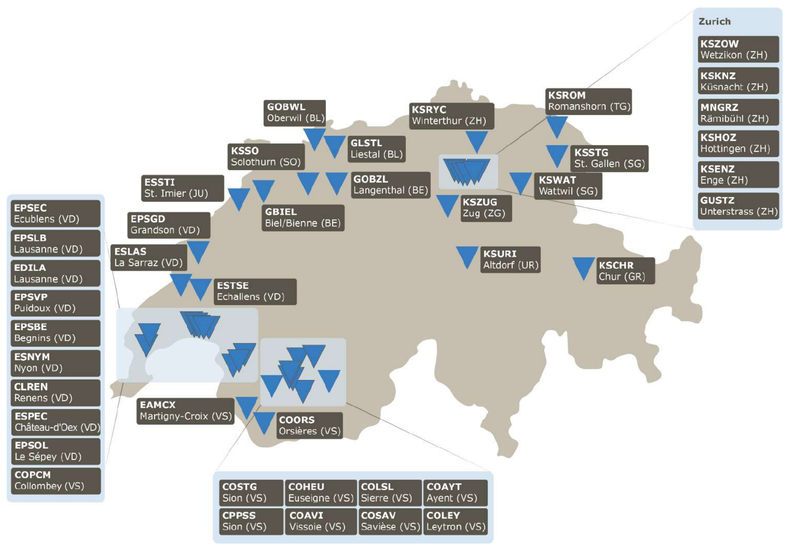


Figure 3. Current network of RaspberryShake seismometers at Swiss secondary schools.

Teachers and students can easily access and visualise data from RaspberryShake seismometers around the world via tools provided by raspberryshake.org and the ShakeNet app.

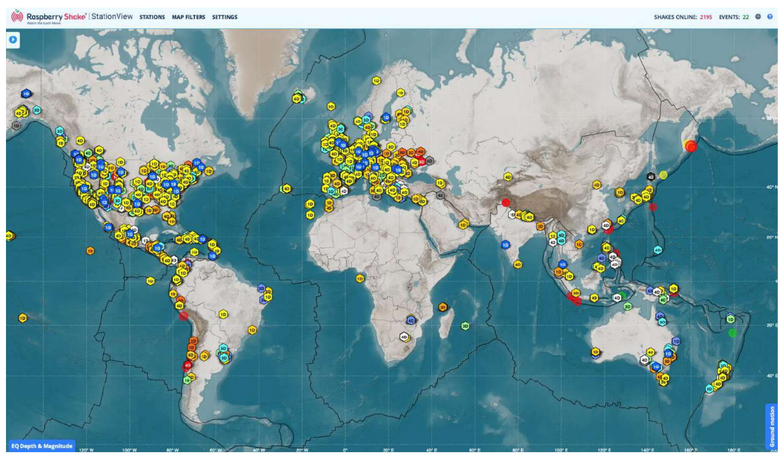


Figure 4. RaspberryShake seismometers accessible worldwide in near real-time (raspberryshake.org).

Jupyter Notebooks

We are developing a suite of Jupyter Notebooks "seismo-at-school Switzerland" for the students to easily access and work with the data and to familiarize them with the basics of scientific data analyses and programming.

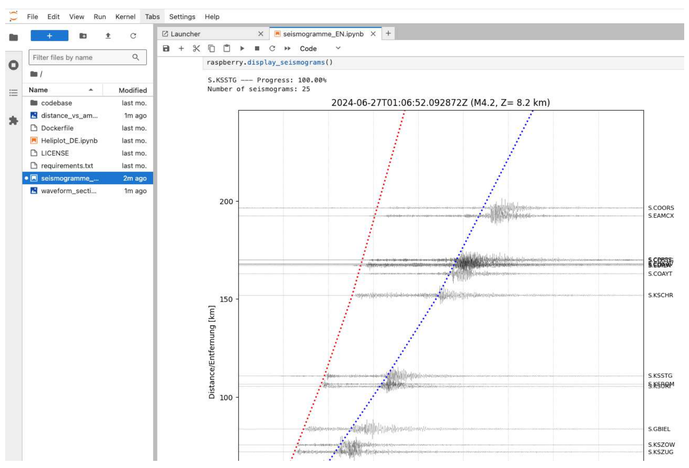


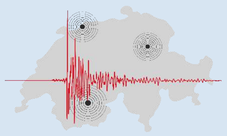
Figure 5. Screenshot of Jupyter Notebook "seismo-at-school Switzerland".

Educational materials

Based on the results from our 2023 teacher survey, we are currently developing new educational materials:

- ✓ Each module will come with a set of activities and experiments.
- ✓ The materials and activities will be made available in multiple languages (DE, FR, IT, EN).
- ✓ The materials and activities will be online accessible via www.seismo.ethz.ch.

Topics and module content



General earthquake knowledge

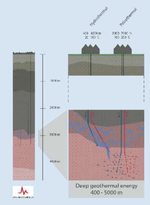
Causes of earthquakes, seismic waves, magnitude and intensity, effects and prepardness, earthquake early warning

Earthquake hazard & risk

Hazard vs. risk, seismic hazard and risk in Switzerland, Europe and the world, earthquake risk tool, rapid impact assessments and scenarios

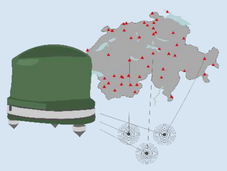
Misinformation & media literacy

Earthquake prediction, conspiracy theories, media literacy



Induced seismicity

Geothermal energy, CO_2 capture and storage



Earthquake monitoring & RaspberryShake

(Broadband) seismometers, RaspberryShake seismometers and tools, Swiss seismic network, locating earthquakes, Jupyter notebooks

National & international community

In the coming months, we plan to strengthen our teacher network across Switzerland and establish and expand international collaborations with seismo-at-school programmes abroad (e.g. Nepal, New Zealand).

More information

Seismo@School **Swiss Seismological Service**

Seismo@School **University of Lausanne**

Seismo@School **HES-SO Valais-Wallis**