An Earthquake Information Service with Free and Open Source Tools

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At the GFZ German Research Centre for Geosciences in Potsdam, the working group Earthquakes and Volcano Physics examines the spatiotemporal behavior of earthquakes. In this context also the hazards of volcanic eruptions and tsunamis are explored. The aim is to collect related event parameters after the occurrence of extreme events and make them available for science and public as quick as possible. However, the overall objective of this research is to reduce geological risks that emanate from such natural hazards. In order to meet the stated objectives and to get a quick overview about the seismicity of a particular region and to compare the situation to historical and current events, a comprehensive visualization is necessary.

Based on the web-accessible data from the famous GFZ GEOFON network a user-friendly interactive web mapping application could be realized. Further, this web service tool integrates historical and current earthquake information from the USGS earthquake database NEIC, and more historical events from various other catalogues like Pacheco, International Seismological Centre (ISC) and others. This compilation of data sources is unique in Earth sciences. Additionally, information about historical and current occurrences of volcanic eruptions and tsunamis are retrievable too. Another special feature in the application is the limitation of time spans via a time shifting tool. Users can interactively vary the visualization by moving the time slider. In addition, the events can be narrowed down based on the magnitude, the wave height of tsunamis or the volcanic explosion index. Furthermore, the use of the latest JavaScript libraries makes it possible to display the application on all screen sizes and devices.

With this application, information on current and historical earthquakes and other extreme events can be obtained based on the spatio-temporal context, such as the concomitant visualization of seismicity of a particular region.