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# NERIES Data Portal – Integrated Access to Distributed Diverse Data Archives

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The Seismic Data Portal (http://www.seismicportal.eu) provides a collection of tools to discover, visualize, and access a variety of seismological data sets, including earthquake parameters, broadband and accelerometric data, European tomography, and historical earthquake catalogs. The Portal was developed as part of the Network of Research Infrastructures for European Seismology project (NERIES, http://www.neries-eu.org, contract no RII3-CT-2006-026130), which was funded under the 6th European Framework Programme to integrate data and service resources for the seismological community. The NERIES project brought together 25 participating institutions and organizations under 19 work packages to produce numerous scientific results through coordinated research, development, networking, and integration activities.

The Seismic Data Portal provides a single point of access to the heterogeneous and distributed data sets developed or made available through the NERIES project. These tools operate in a coordinated manner to provide a cohesive distributed search environment, linking data search and access across multiple data providers. Through interactive, map-based tools, a researcher is able to, for example, build queries linking event parametric data with seismological broadband or accelerometric waveform data from several different data centers. Seismological data is available from 4 different data centers through the European Integrated Data Archive (EIDA), based on the ArcLink data transfer protocol. Accelerometric data is available from 6 (currently) participating accelerometric networks through a single interface.

The Portal architecture is based on a suite of standards and standard technologies, including the JSR-168 & 286 portlet standards, QuakeML, RDF, and best practices in service orientation, allowing interoperability between tools and the integration of new tools as they become available. The Portal runs on dedicated hardware at the EMSC, while the individual tools are implemented as separate portlets which run locally at their respective organizations. As new portlet-based tools are made available, they are easily integrated into the Data Portal. The portlets are supported by web services running at the data centers. These web services provide the programmatic interface between the interactive, web-based portlet tools, and the underlying data archives. These web services are in turn available to external applications, allowing direct programmatic queries to the data archives.

Work on the Data Portal, access tools, and services architecture will continue under the Network of European Research Infrastructures for Earthquake Risk Assessment and Mitigation project (NERA, http://www.nera-eu.org, grant no. 262330), funded under the 7th European Framework Programme. As part of this work, the Data Portal will be extended to include new data sets and access tools from new partners in the Seismology and Earthquake Engineering communities. The NERA project brings together 27 European-Mediterranean institutes and organizations under 22 different work packages.

As part of this continuing effort, we will implement the NERA Common Services Architecture based on the OGC services APIs. This services layer API provides common, Resource-Oriented interfaces across the data access and processing services. This powerful but adaptable interface includes a standard interface to provide facetted search across the different data domains, as well as a Service Metadata Interface, providing self-documenting service information, thereby enabling service discovery, chaining, and the automatic harvesting of data provenance. The CSA will improve interoperability between tools and across projects, enabling the development of higher-level applications that can uniformly access the data and processing services of all participants, such as a Virtual Data Workbench providing a single user console to manage data queries, processing requests, and workflows, or other tools that may create repeatable, parameterized queries for standing orders for data or for use in scripted environments.