DELIVERABLE

D2.15 Interactive Web Tool

Work package	WP2 Communication, Outreach, Dissemination
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Summary

To meet the objectives of Task 2.4 of WP2, we have developed a web page on the main SERA website to clearly direct the diverse stakeholders of the SERA project to the variety of data, products and services developed or further improved through the project: http://www.sera-eu.org/en/activities/services/.

1   Services Web Page

The SERA project has contributed to the development of a wide range of data, data products, software and services (DDSS) in the fields of seismology, earthquake engineering and seismic risk, many of which are already offered as EPOS (www.epos-eu.org) services.

A summary of some of the key products and services that are already available, and can be of use to a wide range of stakeholders, has been added to the SERA website at the following page: http://www.sera-eu.org/en/activities/services/. A request to all WP leaders to provide input for this web page was made leading to a number of products being added to the website, as summarised in the next section. It is noted that this page may continue to grow following the final SERA meeting, when all products of SERA will be internally presented. This page will be promoted through Twitter and the next external newssheet so that a wide range of stakeholders are made aware of the products and services of SERA.

2   Summary of Web Page

Real time earthquake information portal and web services (EMSC)

In brief	*Web services to access real-time earthquake data*
SERA WP	VA1
Summary	A total of 131 seismological agencies (mostly European national seismic institutes) provide real time earthquake data to EMSC. A number of web services are available (or under development) to access real-time data and scientific products which use seismic standards (mostly FDSN, QuakeML). Examples of exposed web services include access to all the moment tensors that EMSC is collecting in real time and access to testimonies (location, time and intensity) provided by eyewitnesses.
Web pages	https://www.emsc-csem.org
Web services	fdsnws-event: http://www.seismicportal.eu/fdsn-wsevent.html Flinn-Engdahl region lookup: http://www.seismicportal.eu/feregions.html Moment tensors: http://www.seismicportal.eu/mtws/ Testimonies: http://www.seismicportal.eu/testimonies-ws/ EventID: http://www.seismicportal.eu/eventid/ Rupture models: http://www.seismicportal.eu/srcmodws/ Near real-time notification: http://www.seismicportal.eu/realtime.html

European Archive of Historical EArthquake Data portal (EMSC/AHEAD)

In brief	*Web portal and services to access historical earthquake data*
SERA WP	VA3
Summary	A pan-European, common, and open platform to support the research on historical earthquake data, by means of: i) tracing back, retrieving, preserving, inventorying, and eventually granting access to the sources of earthquake data (such as papers, reports, macroseismic data points, and catalogues); ii) suggesting relationships among earthquake data of different provenance, to foster new insights, and promote cross-border cooperation. The Archive can be queried by earthquake, by data source and through web services.
Web pages	https://www.emidius.eu/AHEAD/
Web services	Event parameters, macroseismic data, bibliography: https://www.emidius.eu/AHEAD/services/

Seismic waveforms portal and web services (ORFEUS/EIDA)

In brief	*Services and products for digital, broadband seismology in the European-Mediterranean area*
SERA WP	VA2
Summary	EIDA is the European Integrated Data Archive: a federation of distributed data centres that (a) securely archives high quality seismic waveform data and metadata gathered by European research infrastructures, and (b) provides transparent access to the archives by the geosciences research communities. EIDA nodes collect and archive data from seismic networks deploying broad-band sensors, short period sensors, accelerometers, infrasound sensors, and other geophysical instruments. Tools and services to provide transparent access to seismological waveform data and associated metadata across the EIDA nodes are available and continue to be developed.
Web pages	EIDA Portal: http://www.orfeus-eu.org/eida EIDA Data Webinterface: http://www.orfeus-eu.org/webdc3/ EIDA Data Quality http://www.orfeus-eu.org/data/eida/quality/ EIDA StationBook http://orfeus-eu.org/stationbook/ Rapid Raw Strong Motion Portal: http://www.orfeus-eu.org/rrsm
Web services	For each EIDA node: fdsnws-dataselect, fdsnws-station, eidaws-wfcatalog, eidaws-routing http://www.orfeus-eu.org/data/eida/webservices/

Engineering Strong Motion Database portal and web services (ORFEUS/ESM)

In brief	*Web services for digital, broadband seismology in the European-Mediterranean area*
SERA WP	VA3
Summary	ESM, the Engineering Strong-Motion Database, provides a set of facilities to search, select, download and process ground-motion data and associated metadata. The waveforms contained in ESM are relative to events with magnitude ≥ 4.0, mainly recorded in the European-Mediterranean regions and the middle-East. ESM is targeted to applied seismologists, earthquake engineers, professional engineers, geologists and policy makers.
Web pages	ESM Portal: https://esm.mi.ingv.it Strong motion processing: https://esm.mi.ingv.it/processing/ Flatfile: https://esm.mi.ingv.it//flatfile-2018/
Web services	USGS ShakeMap xml: http://esm.mi.ingv.it/esmws/shakemap/1/

European Database of Seismogenic Faults (EFEHR/EDSF)

In brief	*Webservices to access a database of European seismogenic faults*
SERA WP	VA4 and JRA3
Summary	This platform provides data, information and web services to access latest fault information through maintaining, reviewing and updating a central database. This data is used in the European Seismic Hazard Models that are released through the European Facilities for Earthquake Hazard and Risk (EFEHR).
Web pages	EDSF Portal: https://www.seismofaults.eu/index.php
Web services	Both WFS and WMS services for GetCapabilities, Crustal Faults (planes + top), Subduction Areas (zones + contour), EDSF whole dataset: https://www.seismofaults.eu/index.php/services/edsf13-services

European Seismic Hazard Models (EFEHR/ESHM)

In brief	*Portal and webservices to access European Seismic Hazard Models*
SERA WP	VA4 and JRA3
Summary	Access to European seismic hazard models, related data, software and documentation, released through the European Facilities for Earthquake Hazard and Risk (EFEHR). Web services and an interactive portal provide access to hazard maps, hazard curves and uniform hazard spectra.
Web pages	ESHM Portal: http://www.efehr.org/en/hazard-data-access/Intro/
Web services	http://www.efehr.org/en/Documentation/web-services/

European Seismic Risk Models (EFEHR/ESRM)

In brief	*Portal and webservices to access European Seismic Risk Models*
SERA WP	VA4 and JRA4
Summary	Access to the first European seismic risk model being developed in SERA, together with related data, models (exposure and vulnerability), software and documentation, all of which is released through the European Facilities for Earthquake Hazard and Risk (EFEHR).
Web pages	ESRM Portal: https://eu-risk.eucentre.it/ Exposure data: https://gitlab.seismo.ethz.ch/efehr/esrm20_exposure Vulnerability data: https://gitlab.seismo.ethz.ch/efehr/esrm20_vulnerability
Web services	OGC WFS, OGC WMS and OsGeo TMS services for European Exposure Model layers https://eu-risk.eucentre.it/web-services/

Clustering of seismic events toolbox

In brief	*Software Toolbox "Clustering-Transformation to Equivalent Dimensions"*
SERA WP	JRA1
Summary	The toolbox is used to perform clustering of seismic events in the phase (i.e. parameter) space built by any group of parameters unequivocally associated to a set of either seismic or any other (e.g. production) parameters. It comprises two applications: • Application 1A: "*T2ED*", Transformation to Equivalent Dimensions (ED) • Application 1B: "*Cluster_Analysis*", cluster analysis of transformed to ED data obtained from Application 1A (T2ED) Both applications are available in three different versions (one online and two standalone Matlab versions), in order to allow different interactivity level with the user and to support alternative ways of importing input data and parameters, ensuring flexibility and a user-friendly environment. The two standalone versions are freely available to all users and can be downloaded and implemented under GNU General Public Licence.
Web pages	https://git.plgrid.pl/projects/EA/repos/sera-applications/browse/Clustering-Tarsformation2ED_TOOLBOX_D23_2 https://tcs.ah-epos.eu/#app:T2ED https://tcs.ah-epos.eu/#app:ClusterAnalysis

Magnitude distribution testing toolbox

In brief	*Software Toolbox "Magnitude Complexity"*
SERA WP	JRA1
Summary	This toolbox performs tests for investigating the complexity of a random variable (i.e. magnitude) distribution. It consists of two separate applications: • Application 2A: "*ADTestMag*" – Anderson-Darling (AD) Test for testing the hypothesis that a given data sample has been drawn from the exponential or Weibull distribution. • Application 2B: "*MM_MB*" – Testing the existence of multi-modes/ multi-bumps in the distribution of a given random variable. This Toolbox is mainly, but not exclusively focused on testing magnitude distributions. One can analyse any other random variable. Both applications are available in three different versions (one online and two standalone Matlab versions), in order to allow different interactivity level with the user and to support alternative ways of importing input data and parameters, ensuring flexibility and a user-friendly environment. The two standalone versions are freely available to all users and can be downloaded and implemented under GNU General Public Licence.
Web pages	https://git.plgrid.pl/projects/EA/repos/sera-applications/browse/Magnitude_Complexity_TOOLBOX_D23_2 https://tcs.ah-epos.eu/#app:ADMagnitudeTest https://tcs.ah-epos.eu/#app:MultiModalityTest

⌄ Short-term time-dependent hazard toolbox

In brief	*Software Toolbox "SHAPE" (Seismic Hazard Parameters Estimations)*
SERA WP	JRA2
Summary	SHAPE enables an assessment of short-term time-dependent hazard, whose variation in time originates from the time variability of industrial factors that cause seismicity. Seismic hazard within SHAPE is quantified by the Mean Return Period (MPR) of a given magnitude and the Exceedance Probability (EP) of a given magnitude within a predefined time period. Based on the online probabilistic seismic hazard analysis applications available in IS-EPOS platform and with additional features embodied, SHAPE package constitutes a generalized Matlab software. SHAPE is available in two standalone versions, which can be downloaded and implemented under GNU General Public Licence and is freely available to all users.
Web pages	https://git.plgrid.pl/projects/EA/repos/sera-applications/browse/SHAPE_Package
	https://tcs.ah-epos.eu/#app:GDFTDSH
	https://tcs.ah-epos.eu/#app:StationaryTDSHFull
	https://tcs.ah-epos.eu/#app:BasicSSHApplication
	https://tcs.ah-epos.eu/#app:ExcProbMag
	https://tcs.ah-epos.eu/#app:MeanRetPeriod

Facilities for accessing Deep Seismic Sounding data

In brief	*Prototype for access to seismic datasets (Wide-angle and Normal incidence) through doi.*
SERA WP	WP5, NA3
Summary	Deep seismic sounding (DSS) is commonly used to describe controlled source seismic data penetrating to greater depths (over a few kilometers) into the Earth. This Work Package has developed prototype tools for long-term curation of, and access to, DSS data.
Web pages	CIMDEF: a wide-angle deep seismic reflection profile in the Central Iberian Zone: http://dx.doi.org/10.20350/digitalCSIC/10528
	Seismic Study of the Iberian Crust, ESCI Valencia Trough survey: http://dx.doi.org/10.20350/digitalCSIC/9937
	Seismic Study of the Iberian Crust, ESCI-Betics survey: http://dx.doi.org/10.20350/digitalCSIC/9925
	3D reflection seismic imaging of the Hontomín CO2 storage site: http://dx.doi.org/10.20350/digitalCSIC/9906
	Seismic Study of the Iberian Crust, ESCI-North survey: http://dx.doi.org/10.20350/digitalCSIC/9894
	Wide-angle deep seismic reflection profile (ALCUDIA Wide-Angle Transect): http://dx.doi.org/10.20350/digitalCSIC/9061
	Deep seismic reflection profile (ALCUDIA Normal Incidence Transect): http://dx.doi.org/10.20350/digitalCSIC/9049
	Wide-angle deep seismic reflection profile (IBSERSEIS Wide-Angle Transect): http://dx.doi.org/10.20350/digitalCSIC/9018
	Deep seismic reflection profile (IBSERSEIS Normal Incidence Transect): http://dx.doi.org/10.20350/digitalCSIC/9016
	Lithospheric Structure of the Cantabrian Margin - Bay of Biscay (MARCONI): http://dx.doi.org/10.20350/digitalCSIC/8972
	Regional centroid moment tensors for earthquakes in the 2013 CASTOR gas storage seismic crisis: http://dx.doi.org/10.20350/digitalCSIC/8966
	High resolution seismic characterization of the shallow subsurface of the Loranca Basin (Spain) - high resolution 3D: http://dx.doi.org/10.20350/digitalCSIC/8636
	High resolution seismic characterization of the shallow subsurface of the Loranca Basin (Spain) - local 2Dt ransects: http://dx.doi.org/10.20350/digitalCSIC/8635
	SIT4ME: Innovative seismic imaging techniques for mining exploration - Sotiel-Elvira (Spain) dataset: http://dx.doi.org/10.20350/digitalCSIC/8633
	Characterization of the 3D internal structure of the Alhama de Murcia Fault (FAM) in the segments Goñar-Lorca, Lorca-Totana and Totana-Alhama: http://dx.doi.org/10.20350/digitalCSIC/8632
	Multichannel seismic reflection and wide-angle and refraction data acquisition along the Iberia Atlantic Margins: http://dx.doi.org/10.20350/digitalCSIC/8549
	Seismic Study of the Iberian Crust, ESCI-North survey: http://dx.doi.org/10.20350/digitalCSIC/9894

Earthquake engineering test data

In brief	*Database of earthquake engineering experimental data*
SERA WP	NA4
Summary	The SERIES data access portal aims at facilitating the exchange of data and data communication among research infrastructures in Europe through a distributed database of experimental information, where the data are saved at the individual facility and a communication protocol ensures their transfer to the end user in a common language and format. It contains experimental data and all supporting documentation pooling data generated by the research infrastructures during the SERIES and SERA projects, past data from the research infrastructures and from literature and new data uploaded in the future. It is accessible and maintained by a virtual research community.
Web pages	SERIES: http://www.dap.series.upatras.gr

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