Re-designing the European Database of Seismogenic Faults (EDSF) for EPOS: IT design, implementation, and use-case perspectives

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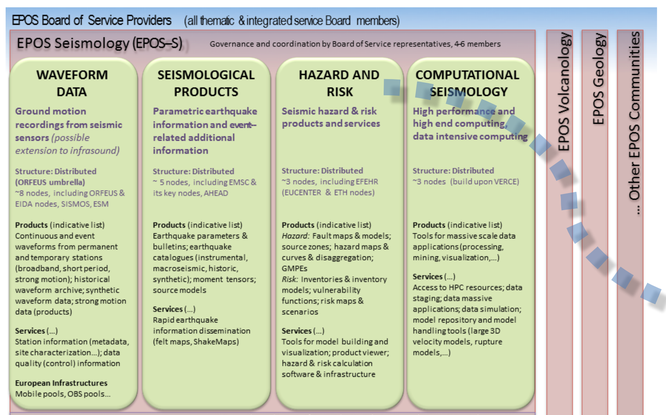
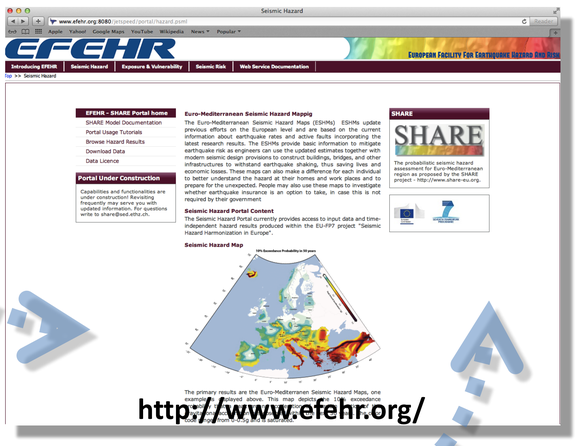
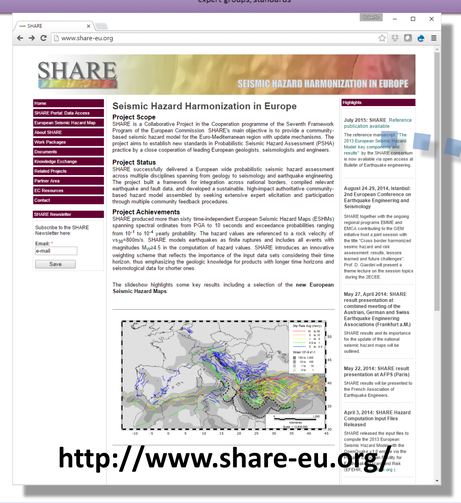
EDSF IN THE EPOS IMPLEMENTATION PHASE (2014-2019)





http://www.efehr.org/

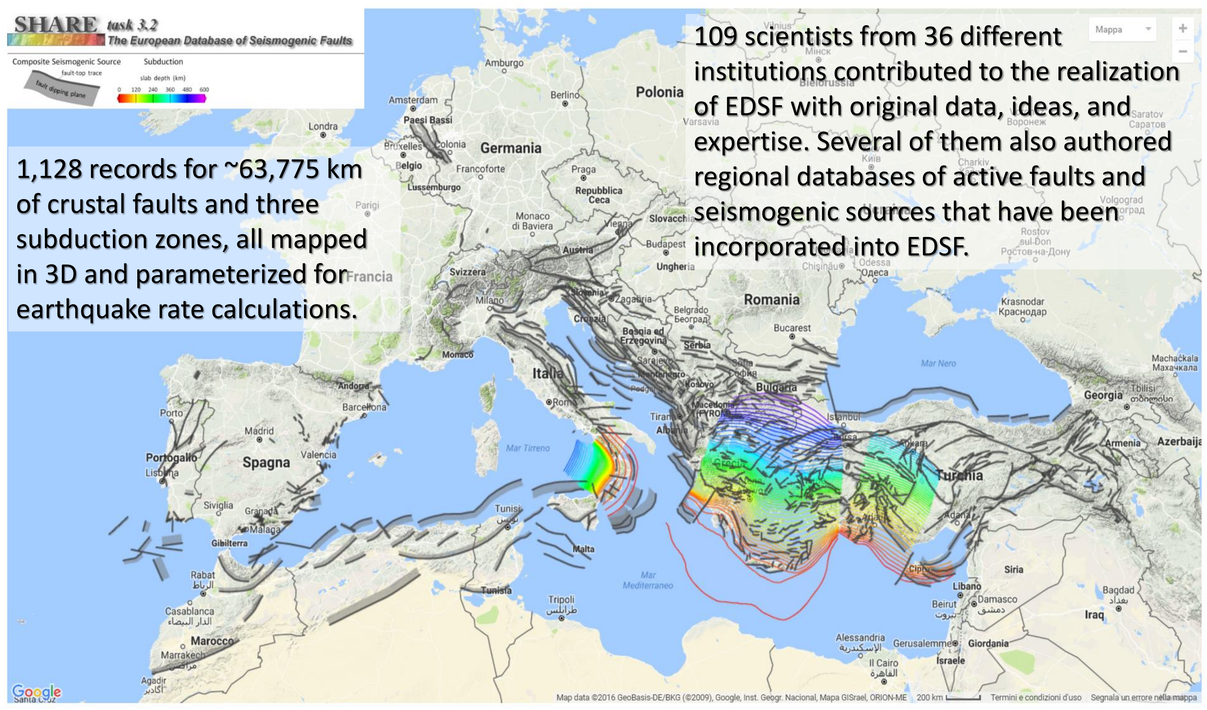


http://www.share-eu.org/

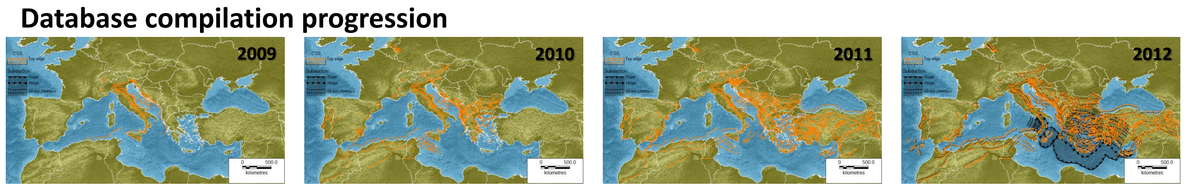
http://diss.rm.ingv.it/share-edsf/

DATABASE CONTENT

http://diss.rm.ingv.it/share-edsf/SHARE_WP3.2_Database.html



Database compilation progression



IMPLEMENTATION PLAN

1. Adapt current EDSF to standards OGC

(format conversion routine already exists)

KML → **(Keyhole Markup Language)** → KML 2.3

validation of KML 2.3 to be done

EDSF BACK END desktop GIS

will require more work and time to define community-specific application schema

GML

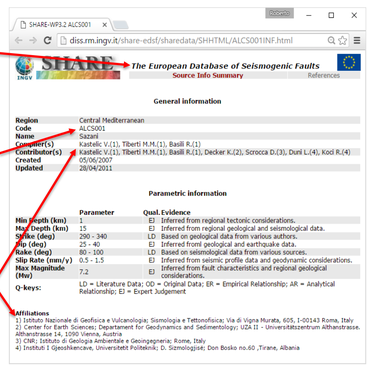
(OpenGIS® Geography Markup Language Encoding Standard)

2. Implementation of Persistent Identifiers (PID)

DOI: identifies the RDB, needs solutions for versioning and fragmentation

Internal ID (main key): identifies faults, needs revision to expand its capabilities and link to update history
[# <fragment>]

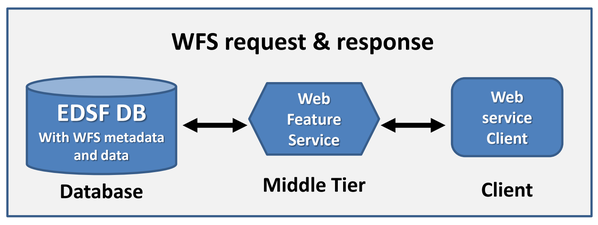
ORCID: unambiguously identifies compilers and contributors, along with their affiliations and scientific profiles (identifying humans in data level 2-3 is equivalent to identifying instruments for raw data)



3. Activate and validate web services

Mapping webservices: OGC ® Web Feature Service 2.0 (WFS) Interface Standard (http://www.opengeospatial.org/standards)

OGC® Open Geospatial Consortium, Inc.

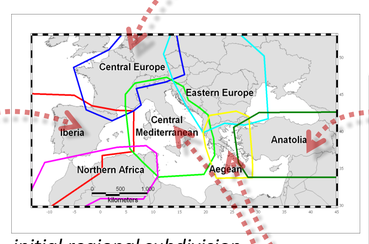


FUTURE DEVELOPMENTS ?

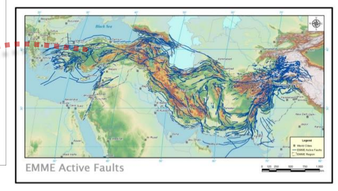
The database was initially conceived as a specific-purpose standalone platform. However, to tackle the challenges ahead in seismological research and meet the new perspectives offered by EPOS, EDSF needs to be revamped.

1. **Affiliate original contributors from project SHARE to align EDSF content with updated regional fault databases**
2. **Seek collaborations with new regional partners for expanded and continuous updates**

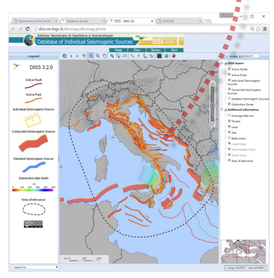
Technical/scientific issues:
- *overlap regions*
- *scientific accuracy*
- *update frequency*
- *data dictionary*
- *file format*



initial regional subdivision during project SHARE

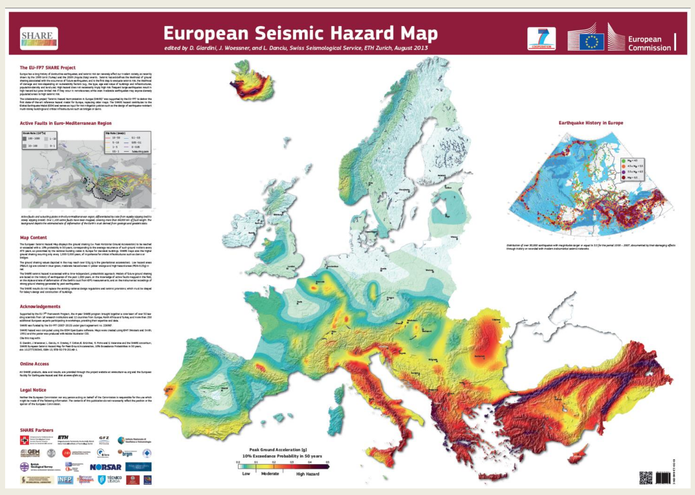
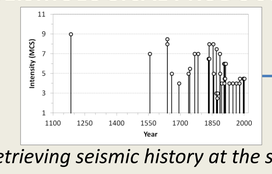
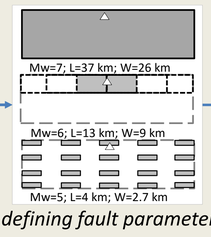
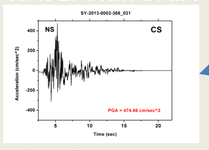
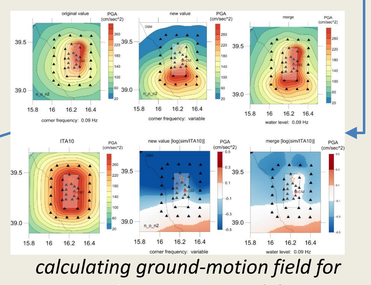


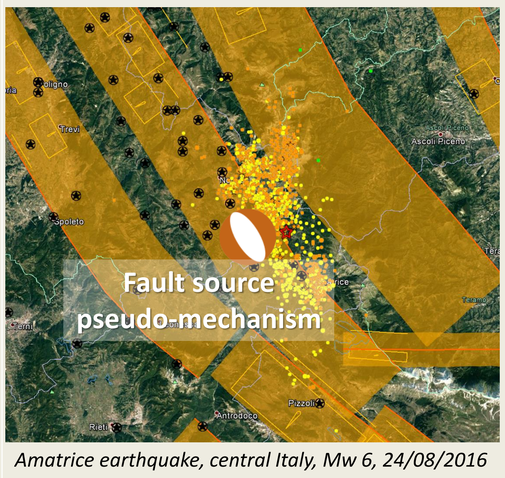
Political issues:
- *workforce (wetware) distribution*
- *funding, commitment, governance*
- *authorship and responsibility*
- *licensing*



USE-CASE PERSPECTIVES

Consulting and using EDSF together with multiple data types from EPOS web services and tools

Before any earthquake: Continental- to regional-scale seismic hazard mapping for building codes and risk mitigation planning	*Before any earthquake*: Local-scale seismic hazard	*After an earthquake and during a seismic sequence*: Understanding what happened
1. Updating the SHARE PSHA maps	**2. Ground-motion scenarios at a site of interest**	**3. Interoperable Web-based mapping**
Community effort together with multiple datasets and resources including, but not limited to, fault sources, area sources, earthquake catalogs, GMPEs, software, and computational facilities.	*retrieving seismic history at the site*	*using web services to plot EDSF fault layer together with other data and perform various analyses*
	**SEISMOLOGICAL PRODUCTS** 	**COMPUTATIONAL SEISMOLOGY** 
	HAZARD & RISK 	*defining fault parameters*
	select the nearest fault to the target site	
	WAVEFORM DATA 	
	downloading reference accelerograms to validate the model	*calculating ground-motion field for various rupture models*



Amatrice earthquake, central Italy, Mw 6, 24/08/2016

compare pseudo-mechanism predicted by the fault with the moment tensors provided by various agencies

		P axis deviation (deg)	T axis deviation (deg)
1	INGV - Berkeley	7.0	4.5
2	INGV	7.0	5.0
3	USGS	9.0	8.5
4	GCMT	11.0	4.1
5	GEOFON	9.0	3.2
6	GEOSCOPE	14.0	5.0

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