

## Towards an Open Access Data Policy for Deep Seismic Sounding data

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Controlled source seismic data acquisition experiments have produced a vast amount of Deep Seismic Sounding (DSS) data since its origins in the late 70's. These data provide high valuable information on the structure and nature of the crust and lithosphere, which constitutes a fundamental and solid basis for research within Solid Earth Sciences. These datasets are unique and constitute the output of an enormous and very expensive scientific effort. Their uniqueness and recognized value evidence the need for their preservation, not only recently acquired DSS data but also the old and legacy data. Furthermore, the new developments in processing and achievements in imaging technologies generates new possibilities for these vintage datasets. The availability and accessibility of these data, therefore, is of foremost importance for the society (scientists, decision-makers and general public).

The research community, aware of the value of these data, has pushed forward Open Data policies based on the FAIR principles (findable, accessible, interoperable and reusable). A long-term plan has been launched by the European Plate Observation System (EPOS, <https://www.epos-ip.org/>) e-infrastructure. The focus is to streamline the integrated use of scientific data, data products and services. Closely linked with EPOS, the Seismology and Earthquake Engineering Research Infrastructure Alliance for Europe (SERA, <http://www.sera-eu.org/home>, also a Horizon 2020 project) includes a working package to set up a data access service for DSS transects. This initiative should ensure the traceability of the data and data products ensuring that third parties can freely access, exploit and disseminate the data by means of a permanent, international identifier, such as Digital Object Identifier (DOI); and provide related information to use the raw data following the FAIR principles. Furthermore, the current aim is to go beyond FAIR by linking the data with its related peer-reviewed publications, other scientific contributions and technical reports, enhancing the visibility and facilitating its use.

A prototype DSS data exchange system has been developed jointly between the DIGITAL.CSIC services and the department of Structure and Dynamics of the Earth of the CSIC-Institute of Earth Sciences Jaume Almera (e.g., <https://digital.csic.es/handle/10261/101879>). Any data exchange system requires well established data formats, which in the case of seismic data is well established (SEGY format, [www.seg.org](http://www.seg.org)). Also, metadata must be included to inform on the context, nature of the data itself, specific details in file format and the relevant legal aspects. In addition, technical aspects include the acquisition parameters, data processing and format of data storage. In the current protocol, once the data meets the previous requirements, a permanent identifier such as a DOI or handle is assigned. Thus, any data, visit, download, or access is accounted for. This information enters into the statistics referencing database and reveals a measure of the impact of the data and/or data product.