



Project of strategic interest NEXTDATA

Deliverable D2.4.2

Archive of sediment core metadata, data transmission to General Portal

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The activities performed during the second year of the project aimed at the search for the information required to complete the metadata form and appropriate retrieval proxies for the paleoclimatic study of the cores collected from the Mediterranean Basin and from the area close to the Strait of Gibraltar, Atlantic Ocean.

During this year of activity, a great deal of metadata from marine sediment cores were archived in the SHARE (Stations at High Altitude for Research on the Environment) GeoNetwork platform, while climatic proxies in WDB (Weather and Water Database) were successively published on the General Portal. These two systems are already used to record high altitude climatic data (Melis et al., 2010, 2011).

The conceptual scheme useful to record both the metadata and the data processed during the first year of the project has been partly modified, in order to allow the registration of new climatic proxies. The database was implemented to export the metadata and data as ODBC database, dBASE, Excel files and text files of marine sedimentary cores and was added to the SHARE GeoNetwork platform and WDB adopted by the Project.

Metadata and data were structured according to WP2.1 and WP2.3, so that they can be rapidly archived by SHARE GeoNetwork and WDB platforms.

The conceptual analysis led to the identification of fifteen entities as reported in Figure 1:

id_cruise	id_sample	sample	IGSN	data_source holder	id_de
BAN00A049	BAN00A049	BAN 82-01		unknown	
BAN00A050	BAN00A050	BAN 82-05		unknown	
BAN00A051	BAN00A051	BAN 82-08		unknown	
BAN00A052	BAN00A052	BAN 82-20		unknown	
BAN00A053	BAN00A053	BAN 84-14		unknown	
BAN00A054	BAN00A054	BAN 84-15		unknown	
BAN00A055	BAN00A055	BAN 84-16		unknown	
BAN00A056	BAN00A056	BAN 84-19		unknown	
BAN00A057	BAN00A057	BAN 84-22		unknown	
BAN00A058	BAN00A058	BAN 84-23		unknown	
BAN00A059	BAN00A059	BAN 84-09 GC		unknown	
DIS00A001	BOS00A001	D2678		BOSCORG	
DIS00A002	BOS00A002	D2911		BOSCORG	
DIS00A003	BOS00A003	D3200		BOSCORG	
GEL00A001	BOS00A004	TTR3-100G		BOSCORG	
GEL00A001	BOS00A005	TTR3-101G		BOSCORG	
GEL00A001	BOS00A006	TTR3-102G		BOSCORG	
GEL00A001	BOS00A007	TTR3-103G		BOSCORG	
GEL00A001	BOS00A008	TTR3-104G		BOSCORG	
GEL00A001	BOS00A009	TTR3-105G		BOSCORG	
GEL00A001	BOS00A010	TTR3-106K		BOSCORG	
GEL00A001	BOS00A011	TTR3-109K		BOSCORG	
GEL00A001	BOS00A012	TTR3-112K		BOSCORG	
GEL00A001	BOS00A013	TTR3-114G		BOSCORG	

Fig. 1. Identification of the fifteen entities put in the SHARE GeoNetwork platform and in WDB

The following 3 entities represent the master entities:

- "core" entity includes all the information needed to identify the geographic location of the core, the well name, the data source-holder, the type of device, the depth of the seafloor, the length of the core, the physiographic province.
- "cruise" entity includes information related to the oceanographic cruise such as the ship's name, the year of the cruise, the project, the sea.
- "reference" entity includes the information about the publications concerning marine sedimentary cores such as author, year, journal and reports, the type of climatic proxy studied in the article.

Each proxy is identified by a field in the table termed as follows:

- benthonic foraminifera;
- planktonic foraminifera;
- stable isotopes;
- calcareous nannoplankton;
- dinoflagellates;
- pollen;
- tephra layer;
- AMS14C.

All the references were collected from different sources dealing with marine geology: 1) Elsevier, Springer, Wiley and *Il Quaternario* (Italian Journal of Quaternary Sciences) 2) Data Reports related to oceanographic cruises ODP, IODP, DSDP, 3) PHD theses.

The metadata were recorded on the SHARE GeoNetwork according to a Parent/Child hierarchical structure.

The following schema-type organizes the metadata into the following levels (Fig. 2):

- Western Mediterranean Sea

Project --- > Mediterranean Sea --- >

- Eastern Mediterranean Sea

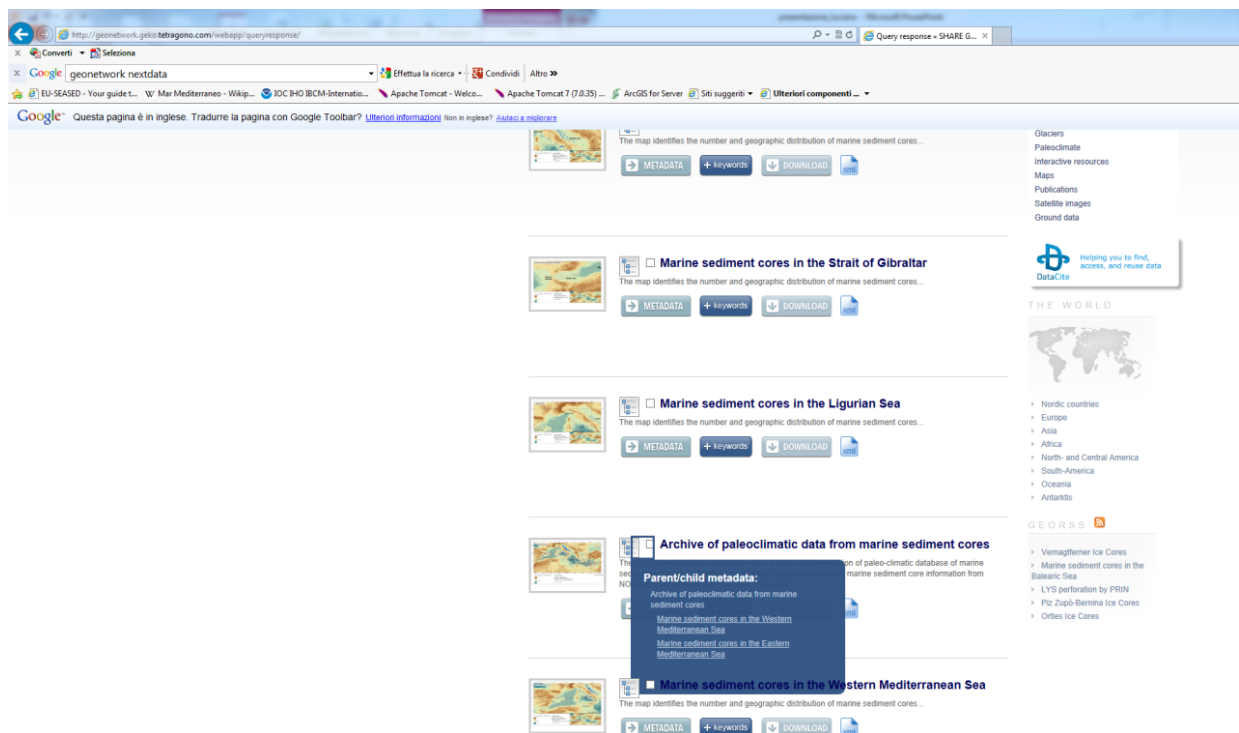


Fig. 2. Parent/Child hierarchical structure for marine sediment cores as reported in the SHARE GeoNetwork platform.

The Western and the Eastern Basins were respectively divided as reported in Table 1:

Mediterranean Sea - Western basin	Mediterranean Sea, Eastern Basin
Strait of Gibraltar, Alboran Sea, Balearic Sea, Ligurian Sea, Tyrrhenian Sea,	Adriatic Sea, Strait of Sicily, Ionian Sea, Aegean Sea

Tab. 1

For each metadata form, starting from hierarchical parent/child structure (listed in the Table 1) it is possible to know the metadata (i.e. sample name, coordinates, device, data source holder, scientific literature, presence/absence of paleoclimatic proxies data) by clicking on the geographic representative core samples retrieved for the Mediterranean Basin.

The climatic data recorded on WDB (WP2.1) are related to the marine sediment cores collected by IAMC - CNR of Naples:

- C90, C90_1 and C836 acquired in 1997 and 2006 with the research vessel Urania and Thetis;
- C5, C5_2_SW104, C6_SW104 and C13_SW104 acquired during 2013 with the research vessel Urania for the project.

For each marine sediment core the following proxies were taken into account (Fig. 3):

- benthonic foraminifera: number of individuals of each species present in the sediment samples of marine sediment cores;
- planktonic foraminifera: number of individuals of each species present in the sediment samples of marine sediment cores;
- calcareous nannoplankton: number of individuals of each species present in the sediment samples of marine sediment cores;
- diatoms: number of individuals of each species present in the sediment samples of marine sediment cores;
- dinoflagellates: number of individuals of each species present in the sediment samples of marine sediment cores;
- pollens: number of elements of each species present in the sediment samples of marine sediment cores;
- magnetic susceptibility;
- AMS ^{14}C (Accelerator Mass Spectrometry ^{14}C) dating;
- stable isotopic data;
- tephra layer;
- radionuclides.

The figure displays three screenshots of the SHARE database interface, showing different tables and their data. Each screenshot includes a menu bar at the top with options like 'File', 'Home', 'Crea', 'Dati esterni', 'Strumenti database', 'Campi', and 'Tabella'. Below the menu, there is a search bar and a list of tables. The main area shows a table with columns for 'id', 'sample', 'id_planc', 'id_section', 'top_level', 'bottom_level', 'weight', and various foraminiferal species names. The first screenshot is titled 'BENTHONIC FORAMS' and shows data for various foraminiferal species. The second screenshot is titled 'PLANKTONIC FORAMS' and shows data for planktonic foraminiferal species. The third screenshot is titled 'DATING MEASUREMENTS' and shows data for dating measurements, including 'id_sample', 'id_data', 'id_section', 'id_planc', 'id_section', 'top_level', 'bottom_level', 'weight', and various dating measurement parameters.

Fig. 3. Example of climatic proxies defined for the archive in WDB (Weather and Water Database).

References

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MELIS M.T., DESSÌ F., BUSILACCHIO M., DI CARLO P., VUILLERMOZ E., BONASONI P. (2011): Il portale GeoNetwork di SHARE. Un catalogo condiviso di metadati a servizio delle ricerche in alta montagna. *Rivista GEOmedia n°3*, 2011. ISSN1128-8132.