



Project of Strategic Interest NEXTDATA

Scientific Report
for the reference period 01 – 01 – 2014 / 31 – 12 - 2014

WP 2.4 Archive of paleoclimate data from sedimentary cores

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1. Scheduled activities and expected results

As a result of the reorganization of the Executive Plan 2014-2017, the scientific activities scheduled for the third year of the WP2.4 were based on the upgrade of the database for the management of spatial and no-spatial data. All the metadata were archived in the SHARE (Stations at High Altitude for Research on the Environment) GeoNetwork platform while climatic proxies were archived in WDB (Weather and Water Database). The metadata were successively published on the General Portal of the NextData Project. This database is dedicated to the management of the marine sedimentary core data both collected from scientific literature and acquired from the Mediterranean Sea and the Atlantic Ocean (Strait of Gibraltar) during the NextData Project.

The analysis potential offered by the Geographic Information Systems and the services available on the web will encourage the dissemination of metadata and of data of quantitative analyses performed on marine sediment cores (planktonic foraminifera, benthic foraminifera, nannofossils, pollen, radionuclides, isotopes, magnetic susceptibility, tephra layers) for Holocene climatic and environmental studies in the frame of the NextData Project. The data will be available to all users (national and international) with different types of permission defined through specific keys of entry regulated by the data policy.

M2 (PM36): Completion of the site for access to data and metadata of sedimentary cores.

2. Deliverables expected for the reference period

D2.4.3 Database implementation and transmission of data to the General Portal.

3. Activities which have been actually conducted during the reference period

3.1 Research activities

During 2014 we carried out an upgrade of the information useful for the compilation of data and metadata and for the retrieval of valid proxies for Holocene paleoclimatic studies related to core samples counted and accounted for the Mediterranean Basin. Marine sediment cores collected during this year are 8034 of which 7108 cores come from the Mediterranean Sea and 926 come from the Atlantic Ocean (Strait of Gibraltar). Metadata related to the new cores have been archived in the SHARE (Stations at High Altitude for Research on the Environment) GeoNetwork platform. An upgrade of the bibliographic research on the sedimentary cores in the Mediterranean Sea and in the Strait of Gibraltar was carried out through the inclusion of new papers, with the aim to acquire all useful information available and/or accessible for paleoclimatic studies. At the end of 2014 the census of the scientific papers with useful paleoclimatic proxies, according to the criteria defined in the first year of activity, reports about 160 papers, which are related to 640 marine cores among all those archived in the database. Climatic data (proxies) were recorded in WDB (Weather and Water Database) for the following marine sediment cores: C90, C90_1m, C836, C5, SW104_C5_02, C6, C6_SW104, SW104_C13. To these we added the new cores collected during oceanographic cruise NEXTDATA-2014 (marine sediment cores: ND2_1, ND5_bis, ND6, ND9, ND10, ND11, ND13) held in the Sicilian Channel - Adriatic Sea from 9 to 21 July 2014. During the cruise a total of 20 sedimentary cores were collected by mean of SW_104 and Kullenberg Gravity corer.

The physical core repository was implemented archiving the 22 sedimentary cores collected in the Sicilian channel and in the Adriatic Sea during the NEXTDATA-2014 campaign (July 9-21, 2014)

3.2 Applications; technological and computational aspects

Research activities carried out during 2014 resulted in a further physical implementation of the marine sedimentary core data storage. The data managed in WDB and GeoNetwork will be available to users through the General Portal of the Project.

3.3 Formation

None in the reference period.

3.4 Dissemination and disclosure

None in the reference period.

3.5 Dissemination

87° Congresso della Società Geologica Italiana e 90° Congresso della Società Italiana di Mineralogia e Petrologia. The future of the Italian Geosciences – The Italian Geosciences of the future, Milano, 10-12 September 2014.

Convegno Accademia dei Lincei. *Climate variability in Italy during the last two millennia – Italy 2k*, Roma, 1 -2 December 2014.

EGU European Geosciences Union General Assembly 2014, Vienna, 27 April - 02 May 2014.

4. Results obtained during the reference period

4.1 Specific results (Data libraries, Measurements, Numerical simulations, etc)

During the third year of the Project, further analysis of national and international databases allowed to have an upgrade of marine sedimentary cores drilled in the Mediterranean Basin and in the Atlantic Ocean, Strait of Gibraltar.

Cores acquired for the Mediterranean Sea are 7108, 3608 more than the second year (census cores 3500) while 926 cores were collected from the Strait of Gibraltar (11 more than the 2013).

The new data, compared to those acquired during the second year of the Project, correspond to cores acquired from different sources as follows:

Atlantic Ocean: BOSCORG, LDEO, GEOMAR, ODP, IODP, DSDP, USGSMP, WHOI, Canada, SIO, URI;

Mediterranean Sea: OSU, RSMAS, Bremen University, IFM-Geomar, Leibniz/Kiel University, SGN, SOC, Uniroma, ITGE, ISMAR-CNR, IAMC- CNR Naples.

During 2014 there was an increase of more than 50% of acquired marine sedimentary cores. The analysis of the data shows that, of all the scientific papers collected until today, approximately 59% of these were published after 2000, highlighting the growing interest of the scientific community to climate and its changes.

4.2 Publications

ALBERICO I., FERRARO L., LIRER F., ANZALONE E., VALLEFUOCO M., BONOMO S., CASCELLA A., PETROSINO P., INSINGA D.D., BARRA R. & MARSELLA E., (2014): Marine sediment cores: archive of the Mediterranean Basin. A tool for Holocene climatic and environmental studies. *Rend. Online Soc. Geol. It.*, 31 (1). *Congresso SGI-SIMP*, Milano, 10-12 September 2014.

BONOMO S., LIRER F., FERRARO L., ALBANO L., ALBERICO I., ANZALONE E., BARRA R., CASCELLA A., CASTELLANO M., DI STEFANO E., D'ORIANO C., FERRARO R., GIORDANO L., LURCOCK P. C., MARGARITELLI G., MARSELLA E., PELOSI N., PUNZO M., VALLEFUOCO M., TARALLO D., ZARCONE G., (2014): Core description collected during Oceanographic Survey: NEXTDATA-2013 (12 – 19 September 2013) - *Strait of Sicily - Gulf of Taranto. CNRSOLAR, identification code 4517TR2014*.

LIRER F., MARGARITELLI G., VALLEFUOCO M., BONOMO S., CAPOTONDI L., CASCELLA A., DI RITA F., FERRARO, L., INSINGA D.D., MAGRI D., MARSELLA E., PETROSINO P., RETTORI R., (2014): Climatic variability during the last two millennia in the Tyrrhenian Sea: evidence from marine sediments. *Convegno Accademia dei Lincei, Climate variability in Italy during the last two millennia – Italy 2k*, Roma, 1-2 December 2014.

LIRER F., MARGARITELLI G., VALLEFUOCO M., AGNINI C., ANZALONE E., BELLUCCI L., BONOMO S., CASCELLA A., DI RITA F., FERRARO, L., INSINGA D.D., MAGRI D., MARSELLA E., PAPPONE G., CAPOTONDI L., PETROSINO P., RETTORI R., SORGATO S., (2014): Paleoclimatic changes occurred during the last two millennia in the central and south Tyrrhenian Sea: a contribution of NextData Project. *Rend. Online Soc. Geol. It.*, 31 (1). *CONGRESSO SGI-SIMP 2014*.

LIRER F., VALLEFUOCO M., ALBERTAZZI S., ANZALONE E., BELLUCCI L., BONOMO S., CAPOTONDI L., CASCELLA A., DI RITA F., FERRARO, L., FLORINDO F., GIULIANI S., INSINGA D.D., LURCOCK P., MAGRI D., MARGARITELLI G., MARSELLA E., PETROSINO P., SPROVIERI M., SORGATO S., (2014): Paleoclimatic changes occurred during the last two centuries in the Gulf of Gaeta (central-eastern Tyrrhenian Sea): a contribution of NextData Project. Vol. 16, *EGU2014-12119*.

4.3 Availability of data and model outputs (format, type of library, etc)

The metadata and the data were collected and structured within a personal database from which it is possible to extract the useful data to publish metadata on SHARE GeoNetwork and climatic proxy on WDB. Currently, the recovered data can be exported as ODBC database, dBASE, Excel files and text files.

4.4 Completed Deliverables

D2.4.3 Database implementation and transmission of data to the General Portal.

During the third year of the Project we archived the metadata for to the new cores acquired for the Mediterranean Basin and Strait of Gibraltar from national and international database and from IAMC – CNR of Naples during oceanographic cruise NEXTDATA-2014 (WP1.5).

5. Comment on differences between expected activities/results/Deliverables and those which have been actually performed.

With the aim to carry out further research of available scientific papers for the implementation of the georeferenced database, we expect to continue this activity also during 2015.

6. Expected activities for the following reference period

Following the activities carried out during the third year of the Project, we have planned to complete, for the 2015, the retrieval of new scientific papers available for the Mediterranean Basin and Strait of Gibraltar.

A georeferenced database will be implemented, for the management of both non-spatial data (attributes) and usable spatial data, to send to the General Portal for the implementation of the WEB GIS, useful for data sharing and management (update and/or input of new data), through the inclusion of new data of marine sedimentary cores acquired during the oceanographic cruise NEXTDATA-2014 and metadata and core data that will be acquired during the next oceanographic cruise NEXTDATA-2015 (from September 17 to October 5) in the Eastern Mediterranean.