Project of strategic interest NEXTDATA

Scientific Report for the reference period 01/01/2018 - 30/06/2018

Deliverable D2.4.B
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Database related to Holocene Tephra layers

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The research activities related to Deliverable D2.4B was dedicated to the final upgrade of marine sedimentary cores for the Mediterranean Sea as shown in Figure 1 (Total cores 8000: 6000 from the Mediterranean Sea and 2000 cores from the Atlantic/Strait of Gibraltar).

All climatic data available from marine keysites collected during the NextData Project for the Mediterranean Sea, and archived in WDB-Paleo, were organized and encoded in excel files and downloaded to Geonetwork (http://geonetwork.igg.cnr.it).

High resolution maps regarding all the cores retrieved in the Mediterranean Sea and those for which paleo-climatic proxies were published in Geonetwork Marine Sediment as marine_sediment cores.jpg and marine_cores_ref.jpg, respectively. Moreover, a shape file (marine_cores_ref.zip) recording the geographical location of cores with associated paleoproxies was also downloaded. All the data are related to marine sedimentary cores collected by IAMC – CNR (Fig. 2) during the oceanographic cruises "NextData2013" onboard the R/V Urania (12-19 September 2013, Strait of Sicily - Gulf of Taranto), "NextData2014" onboard the R/V Urania (9-21 July 2014, Sicily Channel and Adriatic Sea) and "NextData2016" onboard the R/V Minerva1 (11-29 June 2016, Ionian Sea, Strait of Sicily, Tyrrhenian Sea and Ligurian Sea).

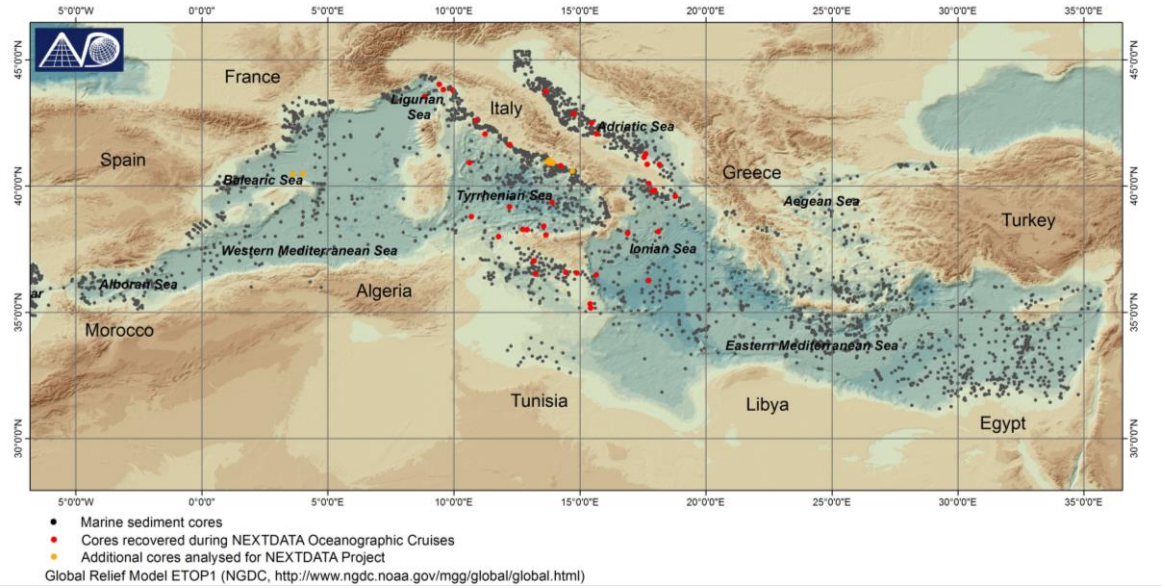

Figure 1 - Overview of the location of all marine sediment cores drilled in the Mediterranean Sea and Atlantic Ocean.

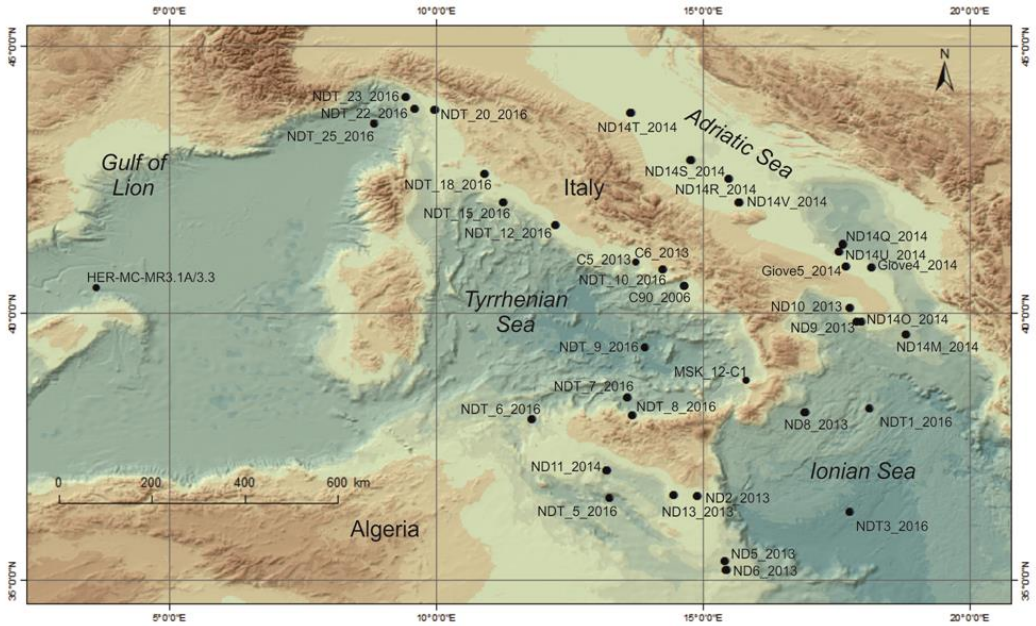

Figure 2 - Location map of the marine sedimentary cores acquired during NextData project. Oceanographic cruises NEXTDATA2013, 2014 and 2016.

Cores	Oceanographic Cruise (yr)	Water depth (m)	Recovery thickness (m)	Location	Magnetic Susceptbility	Planktonic Forams	Calcareous nannofossils	Stable Isotope	Sea Surface Temperature Mg/Ca	Sea Surface Temperature Alkenone	Pollens	Tephra	AMS ^{14}C	Radionuclides	Paleomag.	Time interval (BP)
C90 1m	2006	103	1,05	Gulf of Salerno (central Tyrrhenian Sea)	X	X	X	X				X	X	X		last 574 yr
C90	1997	103	4,75	Gulf of Salerno (central Tyrrhenian Sea)	X	X	X	X				X	X			last 15 kyr
C5	2013	93	4,46	Gulf of Gaeta (central Tyrrhenian Sea)	X	X	X	X			X	X				last 4867 yr
SW104 C5	2013	93	1,08	Gulf of Gaeta (central Tyrrhenian Sea)	X	X	X	X			X	X		X		last 327 yr
C6	2013	118	3,91	Gulf of Gaeta (central Tyrrhenian Sea)	X	X		X							X	last 10 kyr
ND2	2013	89	4,51	eastern Sicily Channel	X	X	X	X		X	X		X		X	last 3218 yr
SW104-ND2	2013	89	1,16	eastern Sicily Channel	X	X	X	X					X	X		last 430 yr
ND6	2013	527	4,47	eastern Sicily Channel (est Malta)	X											older than 10 kyr
ND6 SW	2013	527	0,33	eastern Sicily Channel (est Malta)	X											
ND5	2013	335	3,24	eastern Sicily Channel (est Malta)	X										X	older than 10 kyr
ND5 SW	2013	335	0,27	eastern Sicily Channel (est Malta)	X											
ND13	2013	165	3,9	eastern Sicily Channel	X										X	
ND 8	2013	1821	5	east Ionian Sea	X										X	
ND10	2013	174	3,17	Gulf of Taranto (eastern part)	X										X	
ND10 SW	2013	174	0,55	Gulf of Taranto (eastern part)	X											
ND9	2013	176	4,8	Gulf of Taranto (eastern part)	X	X	X	X				X			X	last 4719 yr
ND9 SW	2013	176	1,34	Gulf of Taranto (eastern part)	X											
SW104-ND11	2014	475	1,33	western Sicily Channel	X	X	X	X	X				X	X		last 5327 yr
ND11	2013	475	4,87	western Sicily Channel	X										X	last 17 kyr
ND14Q AR	2014	1013	5,33	south Adriatic Sea	X	X	X	X		X		X	X			last 22 kyr
SW104-ND14Q	2014	1013	1,16	south Adriatic Sea	X	X	X	X		X		X		X		last 2689 yr
SW104-ND14O	2014	113	1,13	Gulf of Taranto (eastern part)	X	X	X	X				X				last 1194 yr
Giove 4	2014	255	4	south Adriatic Sea	X											
SW Giove 4	2014	255	0,93	south Adriatic Sea	X											
Giove 5	2014	92	4,44	south Adriatic Sea	X											
SW Giove 5	2014	92	1,05	south Adriatic Sea	X											
ND14R	2014	140	5	central Adriatic Sea	X											
SW ND14R	2014	140	1,26	central Adriatic Sea	X											
ND14S	2014	259	5,27	north Adriatic Sea	X											last 10 kyr
SW ND14S	2014	259	1,35	north Adriatic Sea	X											
ND14T	2014	55	4,3	north Adriatic Sea	X											last 6000 yr
SW ND14T	2014	55	1,27	north Adriatic Sea	X											
ND14U	2014	641	3,5	south Adriatic Sea	X											
SW ND14U	2014	641	1,34	south Adriatic Sea	X											
ND14V	2014	78	3,71	central Adriatic Sea	X											
SW ND14V	2014	78	1,19	central Adriatic Sea	X											
ND 14M	2014	655	3,21	north Ionian Sea	X	X		X				X	X			last 22 kyr
SW ND14M	2014	655	1,1	north Ionian Sea	X											
NDT 1 2016 (BIS)	2016	2711	3,82	Ionian Sea	X	X		X								last 10 kyr
NDT 3 2016	2016	3620	3,36	Ionian Sea	X											
NDT 5 2016 (BIS)	2016	1688	2,4	central Sicily Channel	X											
NDT 6 2016	2016	1066	4,14	Tyrrhenian Sea (south western sector)	X	X	X	X					X			last 10 kyr
NDT 6 2016 SW104	2016	1066	1,26	Tyrrhenian Sea (south western sector)	X											
NDT 7 2016	2016	1493	4,45	Tyrrhenian Sea (south western sector)	X											
NDT 7 2016 SW104	2016	1493	1,21	Tyrrhenian Sea (south western sector)	X											
NDT 8 2016 BIS	2016	120	1,95	Gulf of Termini (north of Sicily)	X											
NDT 8 2016 SW104	2016	120	1,22	Gulf of Termini (north of Sicily)	X	X		X								last 800 yr
NDT 9 2016	2016	3359	5,7	Tyrrhenian Sea (south eastern sector)	X											
NDT 10 2016 SW104	2016	76	0,63	Gulf of Naples	X											
NDT 12 2016	2016	100	3,78	Central Tyrrhenian Sea (western sector)	X											
NDT 12 2016 SW104	2016	100	1,29	Central Tyrrhenian Sea (western sector)	X											
NDT 15 2016	2016	386	3,22	Central Tyrrhenian Sea (western sector)	X											
NDT 15 2016 SW104	2016	386	0,96	Central Tyrrhenian Sea (western sector)	X											
NDT 18 2016	2016	110	3,5	North Tyrrhenian Sea	X											
NDT 18 2016 SW104	2016	109	1,34	North Tyrrhenian Sea	X	X		X					X			last 634 yr
NDT 20 2016 BIS	2016	73	2,9	North Tyrrhenian Sea	X											
NDT 20 2016 BIS SW104	2016	73	1,25	North Tyrrhenian Sea	X		X									last 400 yr
NDT 22 2016	2016	436	3,2	North Tyrrhenian Sea (Gulf of Genova)	X								X			
NDT 22 2016 SW104	2016	436	1,29	North Tyrrhenian Sea (Gulf of Genova)	X											
NDT 25 2016	2016	2294	4,78	North Tyrrhenian Sea (Gulf of Genova)	X								X			
NDT 23 2016	2016	531	3	North Tyrrhenian Sea (Gulf of Genova)	X								X			
NDT 23 2016 SW104	2016	531	1,15	North Tyrrhenian Sea (Gulf of Genova)	X											
MSK 12-C1	2012	604	1	Capo Vaticano (south east Tyrrhenian Sea)		X						X	X			last 3832 yr
HER-MC-MR3.1A/3.3	2009	2117	0,27	Minorca Basin (western Mediterranean)		X		X	X	X			X	X		last 2577 yr

Table 1: Sedimentary cores collected during the NextData oceanographic cruises (2013, 2014, 2016) with associated paleoproxies (data): Magnetic Susceptibility; Planktonic Foraminifera; Calcareous Nannofossils; Stable Isotope; Sea Surface TemperatureMg/Ca; Sea Surface Temperature and Alkenones; Pollens; Tephra; AMS ^{14}C; Radionuclides; Paleomagnetism; Time Interval (BP).

id_sample	id_nanno	section	Sample level	top	bottom	Emiliania huxleyi <4m	E. huxleyi >4m	Small Gephyrocapsa	*G. muellerae*
IAM00A062	C5_A001	F	99-100	246	247	0	0	0	0
IAM00A062	C5_A002	F	98-99	245	246	65,72438163	0	2,120141343	0
IAM00A062	C5_A003	F	96-97	243	244	52,92307692	0	0,923076923	0,307692308
IAM00A062	C5_A004	F	94-95	241	242	50,29585799	0	0,295857988	0
IAM00A062	C5_A005	F	93-94	240	241	0	0	0	0
IAM00A062	C5_A006	F	92-93	239	240	67,97385621	0	3,594771242	0

id_sample	id_magnsusc	section	Sample level	top	bottom	Vol. Susc. Meas. in SI (C5)
IAM00A062	C5_A001	A	99-100	702	703	0,12
IAM00A062	C5_A002	A	98-99	701	702	311,43
IAM00A062	C5_A003	A	97-98	700	701	337,3
IAM00A062	C5_A004	A	96-97	699	700	203,16
IAM00A062	C5_A005	A	95-96	698	699	428,12
IAM00A062	C5_A006	A	94-95	697	698	373,35

id_sample	id_planc	section	Sample level	top	bottom	*G. bulloides*	*G. glutinata*	*G. elongatus*
IAM00A062	C5_A001	D	98-99	445	446	38	7	
IAM00A062	C5_A002	D	97-98	444	445	85	23	54
IAM00A062	C5_A003	D	95-96	442	443	15	8	
IAM00A062	C5_A004	D	94-95	441	442	71	48	49
IAM00A062	C5_A005	D	92-93	439	440	64	8	26
IAM00A062	C5_A006	D	91-92	438	439	61	7	28

id_sample	id_stableiso	section	Sample level	top	bottom	18O/16O (‰PDB)	13C/12C(‰PDB)
IAM00A062	C5_A001	F 97-98	97-98	244	245	-0,6572688	0,6083986
IAM00A062	C5_A002	F 94-95	94-95	241	242	-0,3011992	0,8659349
IAM00A062	C5_A003	F 88-89	88-89	235	236	-0,3071848	0,3393131
IAM00A062	C5_A004	F 85-86	85-86	232	233	-2,0804096	0,9553812
IAM00A062	C5_A005	F 82-83	82-83	229	230	-0,809332	0,7466415
IAM00A062	C5_A006	F 79-80	79-80	226	227	-1,0840824	-0,4227197

Figure 3 - Paleoproxies associated to marine sediment cores studied in the Mediterranean Sea during the NextaData Project (an example from Core C5, Gulf of Gaeta).

During this period all the information related to the tephra layers analyzed in selected marine keysites, collected during the project in the Mediterranean sea by IAMC – CNR (Table 1), were improved, organized and archived in excel files, since these proxies have a key role for evaluating the synchrony/diachrony of the climatic changes in the Mediterranean and represent a constraint for age modelling of marine sequences (WP1.5).

NextData Scientific papers (years 2018)

Di Rita F., Lirer F., Bonomo S., Cascella A., Ferraro L., Florindo F., Insinga D., Lurcock P., Margaritelli G., Petrosino P., Rettori R., Vallefuoco M., Magri D., 2018. Late Holocene forest dynamics in the Gulf of Gaeta (central Mediterranean) in relation to NAO variability and human impact. Quaternary Science Reviews, 179, 137-152.

Jalali B., Sicre M.A., Klein V., Schmidt S., Maselli V., Lirer F., Bassetti M.A., Toucanne S., Jorry S.J., Insinga D., Petrosino P., Châles F., 2018. Deltaic and coastal sediments as recorders of Mediterranean regional climate and human impact over the past three millennia. Paleoceanography and Paleoclimatology, 33, 579-593.

Di Rita F., Fletcher W.J., Aranbarri J., Margaritelli G., Lirer F., Magri D., 2018. Holocene forest dynamics in central and western Mediterranean: periodicity, spatio-temporal patterns and climate influence. Scientific Reports, 8. DOI:10.1038/s41598-018-27056-2.

Margaritelli G., Cisneros M., Cacho I., Capotondi L., Vallefuoco M., Rettori R. and Lirer F., (2018). Climatic variability over the last 3000 years in the central -western Mediterranean Sea (Menorca Basin) detected by planktonic foraminifera and stable isotope records. Global and Planetary Change, 169, 179-187. DOI.org/10.1016/j.gloplacha.2018.07.012

Di Rita F., Molisso F., Sacchi M., (2018). Late Holocene environmental dynamics, vegetation history, human impact, and climate change in the ancient Literna Palus (Lago Patria; Campania, Italy). Review of Palaeobotany and Palynology, 258, 48-61.