Project of strategic interest – PNR 2011-2013

NEXTDATA

A national system for the retrieval, storage, access and diffusion of environment and climate data from mountain and marine areas

Partners (indicated in the PNR 2011-2013)
URT EvK2-CNR, CNR-ISAC, CNR-DTA
CMCC, DISAT-UNIMIB, ENEA UTMEA, INGV

Participants involved through calls for special projects
CNR-IIA, CNR-IRPI, CNR-IMAA, CNR-ISE, CNR-IDPA, CINECA, UNITO, POLITO, ARPA-VdA, ICTP, UNIVE, CIMA Foundation, Italian Glaciological Committee

Project coordinator:
Antonello Provenzale, CNR-ISAC

EXECUTIVE PLAN FOR THE SECOND YEAR

GENERAL CONSIDERATIONS

Owing to a fund reduction for the second year (the project received 60% of the funding which was originally foreseen) and to the natural evolution of the project, the activities for the second year have been restructured as illustrated in this document. In particular, Sub-project 1 now includes two more WorkPackages (WP 1.6 for paleoclimatic data from continental regions and WP 1.7 for ecosystem data) and Sub-project 2 now includes one more WorkPackage, namely WP 2.7, devoted to the construction of the General Portal.

The core activities of the project, devoted to field measurements in remote mountain areas, and the associated data quality requirements, have been preserved and expanded, for all monitoring efforts: the network of fixed measurement stations, the measurement campaigns, and the GAW-WMO climatic observatories included in the project. The types of data have been completed with the inclusion of cryospheric data (archive of Italian glaciers), snow measurements, hydrological and ecosystem data, thanks to the involvement of new partners and research groups identified through the calls for proposals issued in November 2012. International links with programmes such as GMES, GEO/GEOSS, SUSKAT, ABC, CCAC and with the main international agencies active on these themes (e.g., UNEP) have been strenghtened. New calls for proposals will be devoted to the inclusion of long-term ecological data and hydrological data. The possibility of including data on the Alpine environment from environmental agencies will be explored. A transportable system for atmospheric composition and climatic measurements in Karakoram will be tested.

Paleoclimatic activities have been finalized to obtaining a reconstruction of paleoclimatic conditions and variability in Italy in the last two Millennia, with specific emphasis on the last few Centuries. This reconstruction will be based on the available paleoclimatic data and will be complemented by climatic simulations having a focus on the Mediterranean and on Italy. An important element will be the availability of the data and the numerical results in easily-accessible and open-access archives. Proxy data will be complemented by instrumental data, glaciological information (glacier extents and snout positions) and marine reconstructions for the Mediterranean. During the second year, the types of paleoclimatic data needed for the project will be defined, the relevant data will be identified and recovered, a first version of the paleoclimatic archives will be built, and the paleoclimatic simulations will be started.

The results of the global climate simulations will be made available through a system of THREDDS servers active at the various project partners; during the second year, the system of numerical archives will be made accessible also through the first version of the General Portal, and the list of available numerical simulations will be finalized. Hydrostatic and non-hydrostatic numerical simulations and climate projections will be made available for the mountain regions of interest for the project, also thanks to the involvement of new partners and research groups identified through the calls for proposals issued in November 2012.

By the end of the second year, a first operational version of the General Portal and of the different data archives will be made available. The portal for the ground data, based on the GeoNetwork software for metadata and on WDB for data, is already active and the validated measurements are openly accessible. The GeoNetwork/WDB system has been expanded to include paleoclimatic data from ice cores and marine sediments. New data types will be included, such as cryospheric and ecosystem data. These latters will be managed through software which will be compliant with the international standards on ecological data. The activities of the data and modelling center in Nepal will be continued. All information on the project activities are available at the web site www.nextdataproject.it, and will be made available through the General Portal.

The pilot studies launched during the first year will continue and new pilot studies will be started. New studies will be devoted to: measurement and simulation of liquid and solid precipitation in high-altitude regions; estimates of the status and recent evolution of the cryosphere in the Italian Alps; high-resolution estimates of the spatial distribution of the temperature and precipitation climatologies in Alpine areas; effects of climate change on Alpine plant germination.

DESCRIPTION OF NEXTDATA PROJECT STRUCTURE

The NextData project is subdivided into two Sub-projects (Sp), entitled

1. **Integrated observation system for environmental and climate monitoring**

2. **Long-term archives of digital data on environment and climate and pilot studies on data use**

The two Sub-projects represent the two specific methodological approaches of the NextData project: (i) the observation phase, involving the planning, observation and collection of data according to specific scientific and experimental requirements; (ii) the phase involving storage, analysis and interpretation, associated to specific computer science needs for visualization techniques and data analysis. The pilot studies included in this phase will permit a rapid focus on problems arising from the issues considered, to provide appropriate suggestions and solutions, and supplying answers to crucial questions on the impacts of climatic and environmental variability.

Sub-project 1. Integrated observation system for environment and climate monitoring

The first Sub-project aims to create an integrated observation system and is divided into seven Work Packages (WP) according to the type of data measured. They are associated with diverse requirements of research, and of climate, environmental, experimental, instrumental and technological applications:

WP 1.1 High-altitude climate observation system

WP 1.2 GAW-WMO (Global Atmosphere Watch) climate observatories

WP 1.3 Marine observation systems and climate reconstructions

WP 1.4 Environment and climate data from non-polar ice cores

WP 1.5 Paleoclimate data from marine sediments

WP 1.6: Paleoclimate data from continental regions

WP 1.7: Mountain ecosystems and biodiversity

Sub-project 2. System of long-term environment and climate digital archives and pilot studies on data use

The second Sub-project is devoted to the creation of environmental and climatic archives, data analysis and interpretation and pilot studies. It covers the different types of archive corresponding to particular WPs:

WP 2.1 Archive of high-altitude observation networks

WP 2.2 Archive of marine observation networks and climate reconstructions

WP 2.3 Archive of paleoclimatic data from ice cores and continental regions

WP 2.4 Archive of paleoclimatic data from marine sediment cores

WP 2.5 Archive of numerical simulations and projections

WP 2.6 Pilot studies on data use, dissemination and project coordination

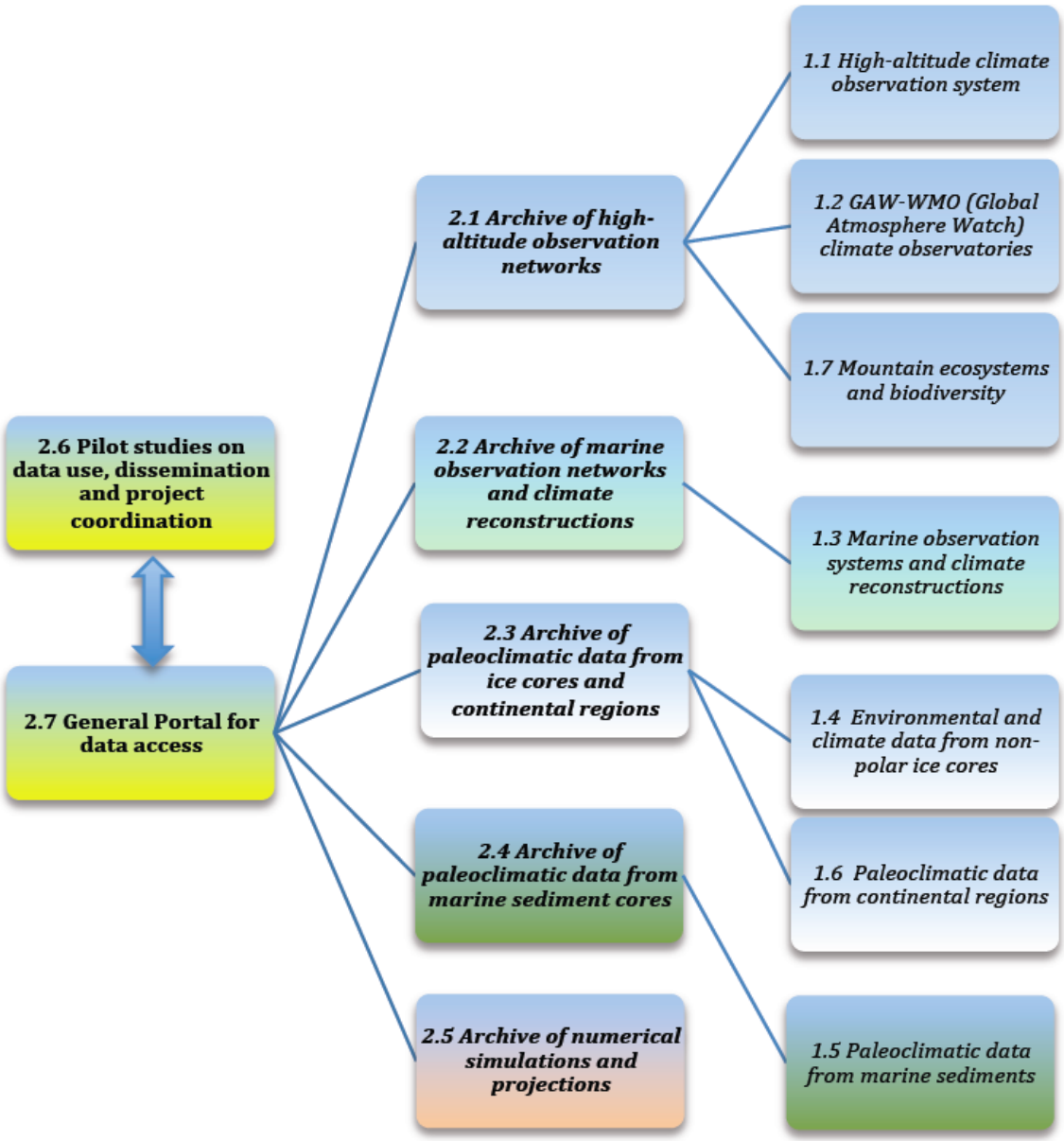
WP 2.7 General Portal for data access

Part of the collected data will be stored within a single distribution centre, while part will be made available at the computing centres of the participating institutions and bodies. The General Portal of access, developed in collaboration with the GeoNetwork of SHARE, will provide access to the entire series of archives in a

clear, user-friendly way. The results and methods of the pilot studies will be made available on the General Portal.

The Pert diagram shown in Figure 1 highlights the relationships among the Work Packages which compose the NextData project. The observational Work Packages of Sub-project 1 are devoted to various types of measurement and communicate with the Work Packages on archive construction. The WP1.1 and WP1.2, regarding high-altitude measurements, and WP1.7, on mountain ecosystems and biodiversity, communicate with WP 2.1, devoted to archives of high-altitude observational data. The WP 1.3, on marine observation systems, directly communicates with WP 2.2, devoted to marine archives. The WP 1.4, on non-polar ice cores, and WP1.6, on paleoclimate data from mountain archives, communicate with WP 2.3, while WP 1.5, on climatic data from sediment cores, communicates with WP 2.4. The WP 2.3 and WP 2.4 communicate with the WP 2.1 and use the same software a structure. The WP 2.5 collects the data of numerical simulations. Finally, WP 2.6 is devoted to pilot studies, to collate and disseminate their results and to project management, while WP 2.7 communicates with WPs 2.1-2.6 for the development of a General Portal of access to the data produced or collected by NextData.

FIGURE 1. Pert diagram for the NextData project.



PROJECT COMPONENTS

The project is divided into two Sub-projects with a total of fourteen Work Packages (WP), as described in detail below.

Sub-project 1: Integrated observation system for environment and climate monitoring

The Sub-project envisages the development of an integrated observation for environment and climate monitoring, able to promote measurement networks in mountain and marine areas and to deal with the entire lifetime of the data. It includes the development of measurement and data transmission technologies that are easy to transport, and dedicated for regions with extreme environmental conditions. The measurements will include meteoclimatic and air quality data, the coring of non-polar ice and marine sediments, and environmental data (biodiversity, hydrological cycle). The activities will be undertaken in synergy with international programmes and projects (SHARE, GAW-WMO, UNEP, GMES, GEO/GEOSS, GEWEX, SeaDataNet, ICOS, ECRA).

WP 1.1 High-altitude climate observation system

Second year:
Continuation and upgrade of the in-situ measurement programmes in the regions considered by the Project. Activation of new measurement programs to support climate and environmental studies in the regions considered by the Project.
Use of a transportable system for the measurements of atmospheric compounds and climate-environmental parameters in a remote high-elevation region in Karakorum (Pakistan), in collaboration with other national and international projects (e.g. ABC-UNEP, PON I-AMICA).
Integration and exchange of data with other international initiatives on measurement networks (e.g. GMES, GEO, SUSKAT, ABC, CCAC) and strengthening of the relationships with the main international agencies which act as focal points for these initiatives (e.g. UNEP).

Deliverables:
D1.1.4: Report on the activities of the second year and transmission of data to the archives and to the General Portal.

WP 1.2 GAW-WMO climate observatories

Second year:
Continuation of the observation and investigation activities at the GAW-WMO Global Stations led by Italian Institutions (implementation of measurement programmes and technological facilities).
Start of collaboration activities at remote high-elevation GAW-WMO stations in Italy (Plateau Rosa) and at other SHARE stations (e.g. Campo Imperatore), according to the GAW-WMO strategic plan.
The scientific community will be informed of the upgrade/implementation activities at the stations. The resulting data will be shared through the NextData General Portal and the other databases, as well as by participating in meetings, workshops and conferences in the framework of national and international initiatives (e.g. GAW-WMO, ACTRIS, GEO, Copernicus, MACC-2).

Deliverables:
D1.2.4: Report on the activities of the second year and transmission of data to the archives and to the General Portal.
D1.2.5: Report on the upgrade of the GAW-WMO stations managed by Italian research groups and/or participating in the SHARE project.

WP 1.3 Marine observation systems and climate reconstructions

Second year:
The results of the first year of activity and a budget reduction bring about the need to revise the activity for the second year of the project.
More time will be dedicated to implement a localization technique within the data assimilation scheme and the validation of AMIP data, while it will start the production of the RR of the Mediterranean Sea at 1/16 of the degree covering a period of sixty years from 1953 up to 2012. This RR will use AMIP forcing or another atmospheric forcing that will be evaluated in this new configuration.
Activities during the second year of the project will concern:

- the analysis of AMIP atmospheric data and the other atmospheric data for AMIP validation;
- the improvement and calibration of the data assimilation scheme OceanVar;
- the starting of RR production covering a sixty years time period.

Deliverables:
D1.3.3: Report on atmospheric forcings and data assimilation
D1.3.4: Preliminary report on the Mediterranean RR and data transmission to the archives and the General Portal.

WP 1.4 Environment and climate data from non-polar ice cores

Second year:
Atmospheric dust measurements of the 2012 ice core at Colle del Lys; new ice core drilling at Colle del Lys, planning of the next Himalaya-Karakoram ice core drilling activities and exploration of the logistical possibilities for the South Gasherbrum (Karakoram) glacier. Development of mineral dust optical properties measurement system and auto-inflatable tend for remote camp activities.
Reconstruction of mineral dust record from the 2012 Colle del Lys ice core and reconstruction of the staked dust curve, from about 1930. Preliminary dating of the dust curve also by density firn/ice modelling.
Geophysical measurements (radar) of the Baltoro Glacier (Pakistani Karakoram) and site selection for the 2014 ice drilling activities in the Gasherbrum I area, with reconstruction of the bedrock topography and presence of submerged crevasses. If possible, reconstruction of the radar stratigraphy of the selected drilling site.
Ice core drilling until bedrock of the Lys Glacier for extend the climate records more than a century, using the 8 cm diameter drilling system from IceField©Canada (EvK2-CNR), that permits to reach the 250 m depth. In collaboration with the Physics Dept. of the University of Milano, development of a measurement system to define the optical properties of the mineral dust and reduce the size distribution to 0.2 micro-meter diameter. A new light-weight auto-inflatable tent will be developed in collaboration with the Physics Dept. of the University of Milano, for use in cold and remote areas such as the Karakoram or the Himalaya mountains. Lab tests will done at EuroCold UNIMIB and at Colle del Lys (Valle d'Aosta).
Glaciological surveys on the Ortles glacier will be performed, in order to sample the seasonal snowpack and download data from the automatic weather station. These surveys will take place at the beginning

(September) and end (June) of each accumulation season. The firn and ice cores collected on the Ortles glacier will be cut into two sub-cores. We will decontaminate and analyze the first core using a continuous melting system developed at the IDPA-CNR laboratories. The concentration of 20 TEs, black carbon (BC), dust as well as electric conductivity will be continuously measured, reaching a resolution < 5 mm. We will also directly collect discrete samples from the melting device at high resolution (20 to 50 mm) for heavy metals, Pb isotopes, and levoglucosan. The other sub-core will be subdivided to provide samples for stable isotopes (resolution ranging from 10 to 30 mm.

Deliverables:
D1.4.2: Report on measurement activities; data transmission to the archives and the General Portal.
D1.4.3: Report on technological developments.
D1.4.4: Report on the glaciological survey, sample preparation and melter method development for the Ortles glacier.

WP 1.5 Paleoclimatic data from marine sediments

Second year:
The research activities of the second year of the project include the NextData oceanographic cruise aboard the ship R/V Urania of CNR, which will be held in the period from September 12 to 22, 2013 in sectors of continental shelf of Taranto Gulf and Sicily Channel. During the cruise, high resolution seismic profiles will be measured in order to position the drilling sites correctly. For each drilling site, two cores will be collected, one using the gravity corer and the other using the SW104 corer system of CNR-ISMAR (Bologna). The cores will be opened, described and sampled on board. This sampling phase will speed up the analysis of the samples in the following months. After the oceanographic cruise, measurements of the secular variation of the Earth's magnetic field will be performed on all the cores at the INGV Laboratory of Paleomagnetism in Rome.
The quantitative analysis of calcareous plankton (foraminifera and planktonic calcareous nannofossils), pollen (in collaboration with the La Sapienza University of Rome) and dinoflagellates (in collaboration with the Utrecht University), and the petrochemical analysis on the potential layers of recognized tephra (in collaboration with the researchers of the Federico II of Naples University) will be started.
In the second year of the project, it will be performed a high-resolution integrated study of core C5 (core length 7.11 meters and recovered at 93 m water depth by Kullenberg gravity core system) and core C5-SW_104 (core length 1.08 meters and recovered at 93 m water depth by gravity core system SW_104), recovered on continental shelf of Gaeta Gulf (central Tyrrhenian Sea) during February 2013 (R/V Urania-CNR). This area has been selected as a potential key-site for paleoclimatic studies for the last 2000 years.
In the second year of the project an analysis of the literature on data from Mediterranean marine cores will be conducted, to propose a scheme of the climatic oscillation recognizable during the last two millennia. This scheme will be used as framework to interpret the new data (data from new marine cores recovered for NextData project). In addition, the analysis of literature data will be extended to the the Strait of Gibraltar area, including sectors of the Atlantic Ocean, to compare, in subsequent developments, the response of this oceanic sector and of the Central-Western Mediterranean to climatic fluctuations.
The data acquired will be transmitted to the General Portal.
In the second year of the project, it will be organized the Congress of the Italian Association for the Study of the Quaternary - AIQUA 2013 entitled "The Coastal Marine Environment of the Mediterranean today and in the recent geological past: to know in order to understand", held Naples on 19, 20 and 21 June 2013, supported by the NextData project.

Deliverables:
D1.5.2: Report for the Mediterranean area, on the recognised (based on literature data) climatic oscillations for the last two millennia, from marine cores; transmission of data to the archives and General Portal.

WP 1.6 Paleoclimatic data from continental regions

Second year:
These activities are part of two special projects (presented to the calls at the end of the first year) devoted to paleoclimatic reconstructions from mountain terrestrial archives and lake sediments.
Peat and ice cores will be processed at their highest achievable resolution and will contain multiple parallel subsamples. We will cut the peat cores into 2 sub-cores where one section will be analyzed by X-ray fluorescence core scanner (XRF-CS) to determine 29 chemical elements at a nearly continuous resolution (< 2.5 mm) and the other core will be used for trace elements (TE), rare earth elements (REE), Pb isotopes by ICP-MS analyses and for physical determination (water content, ash, organic matter content). Pore-water pH, electrical conductivity (EC), soot and micro-carbon particles will be also measured. The age/depth relationship will be based on radiocarbon (^{14}C) and radiogenic (^{210}Pb and ^{137}Cs) analyses.
Deliverables:
D1.6.1: Report on second-year activities
D1.6.2: Report on peat bog dating, sample preparation, and X-ray fluorescence core scanner

WP 1.7 Mountain ecosystems and biodiversity

Second year:
These activities are conducted in the framework of ongoing projects (faunal and vegetation monitoring in the Italian mountain areas) and of a new special project which will be launched during the second year. The Pilot Study 2.6b, devoted to the analysis of the changes in terrestrial biodiversity in areas of high altitude in the north-western Italian Alps, is based on the measurements obtained in WP1.7. During the second year, the following activities will be conducted: (i) continuation of field campaigns to measure terrestrial faunal biodiversity in three selected protected areas in the northwestern Italian Alps; (ii) continuation of micro-meteorological monitoring at the selected test sites; and (iii) end of the analysis and identification of the samples collected during field sessions and of the measurements of arthropod biomass, both in term of weight and volume. A new activity on long-term mountain ecosystem monitoring will be started.

Deliverables:
D1.7.1: Report on second-year activities.

Sub-project 2: Long-term system of digital data on climate and environment, and pilot studies on data use

Sub-project 2 develops a system of repositories storing climatological and environmental data from measurements made during the project, pre-existing measurements, and numerical simulations. It contributes to the establishment of a physical archive of ice cores to the archives of marine sediment cores. It also builds a General Portal providing access to the entire archive ensemble and a centre for data collection and analysis in the Himalaya-Karakorum region, in collaboration with major international research programmes. Sub-project 2 additionally foresees a number of pilot studies based on the use of the Portal, for the definition of the "scientific questions", and for providing answers to applicative questions concerning climate and environment change impacts. It will cover, moreover, training and educational activities and implement the dissemination of NextData results.

Sub-project 2 is divided into seven Work Packages, devoted to the construction of archives relating to the different types of data collected during the project, the construction of the General Portal of data access and the implementation of pilot studies based on the use of the data made available by the General Portal.

WP 2.1 Archive of high-altitude observation networks

Second year:
Full implementation of the archives for atmospheric data from the meteo-climatic stations and the GAW-WMO stations participating in the Project, including meteorological parmeters, solar and infrared radiation, atmospheric composition. A dedicated WEB-GIS will be implemented, in collaboration with the SHARE GeoNetwork system. Meteo-climatic data from other national and international entities will also be included.
Prosecution of the activities of the data elaboration center in Nepal and strengthening of the relationship with the main institutional and scientific partners in Pakistan (PMD, WAPDA; GCISC), focusing on the management and upgrading of local observationl networks and data storage, processing and validation according to international QA/QC protocols. The discussion with the international scientific community on the key issues for the HKKH region will be continued.
It will also be started the inclusion of data on snow cover in the northwestern Italian Alps, on the status and evolution of the Italian Alpine cryosphere and a high-resolution climatology for the Italian Alps (all related to special projects presented to the calls issued at the end of the first year). It will be started the construction of an archive of ecological and biodiversity data from mountain areas, compatible with international standards (eg, ENV-Europe) and with the SHARE GeoNetwork. Two meetings of the researchers involved in the high-altitude WPs will be organized, in order to harmonize the data management and protocols for the Web archives and to refine the key scientific questions which are to be addressed. An international meeting with representatives of other projects and measurement networks will be organized.

Deliverables:
D2.1.3: First version of the specific portal; data transmission to the General Portal.
D2.1.4: Report on the activities of the data and simulation center in HKKH.

WP 2.2 Archive of marine observation networks and climate reconstructions

Second year:
In the second year of the project, the discussion on the archive organization and on the products release will be opened to the scientific community. The historical marine data archive will be updated following the dataset updates. In the second year of the project, the archive will be created with the produced RR data and

a second version of the catalogue will be implemented on the basis of the new products. In addition, the interactive system for viewing and downloading the archive will be developed. On the base of the obtained results, it will be evaluated when to organize a meeting with the community of the end users, with the release of the beta archive version and the specific thematic portal.

Deliverables:
D2.2.3: Opening of the archives on essential climatic variables; transmission of data to the General Portal.

WP 2.3 Archive of paleoclimatic data from ice cores and continental regions

Second year:
In the second year, the survey and collection of information on drill ice core in non-polar glaciers will continue and, after the complete installation of WDB database on the DISAT server, the data and metadata on ice cores will be included in the GeoNetwork portal.
The cartographic Geodatabase of world glaciers, linked by means of the GLIMS project to the archive containing information on already drilled glaciers, will be set up. At the same time, we will proceed with the collection of the available satellite data (images, DTM, etc.) for the analysis of Alpine and Himalayan glaciers. These data will be included in the GeoDataBase and will be also used in the future works contributing to the creation of a Decision Support System (DSS) for the identification of drillable glaciers. In particular, we will process and analyse the satellite images from ASTER (Advanced Spaceborne Thermal Emission and Reflection Radiometer) and from LANDSAT TM and Landsat Enhanced Thematic Mapper (already used in the recent past to generate the GLIMS database), and the surface temperature and albedo data from multi-temporal MODIS images.
Digital terrain models will be used to estimate glacier topography; we are evaluating the possibility to use national models to this end. Digital terrain data from SRTM (Shuttle Radar Topography Mission) will be also archived, providing a global homogenous information with 30 m spatial resolution. The topographic data will be used to infer a set of primary attributes related to the slope and shape of the glacier slopes, size and aspect, relief energy and convexity/concavity; these parameters will be integrated with those derived from satellite imagery to obtain information on glacier drillability.

Deliverables:
D2.3.2: Report on the ice core archives; transmission of information to the General Portal.
D2.3.3: Report on the archive of paleodata from continental regions; transmission of information to the General Portal.

WP 2.4 Archive of paleoclimatic data from sediment cores

Second year:
In the second year of the project the collection of information on the Mediterranean Basin will be completed. This information is essential to fill the metadata format on censused cores and activate the transmission of data and metadata to the General Portal. Research institutions will be contacted, in order to retrieve information (metadata) on marine sedimentary cores in the Mediterranean Basin, which was not accessible through inspection of the scientific literature and of international databases.
We will be continued to collect and study the scientific literature on the metadata available for the area of the Atlantic Ocean near the Strait of Gibraltar. It will be identified a suitable site for the construction of a new core repository to storage the new marine cores acquired during NextData Project. The cores located within the core repository, and the related metadata and data, will be made available to the scientific community at the end of the project. Moreover, the new core repository will be available to the scientific community for the storage of marine sedimentary cores and will be linked with other core repositories in Italy.

Deliverables:
D2.4.2: Archive on marine sediment core data and metadata; transmission of information to the General Portal.

WP 2.5 Archive of numerical simulations and projections

Second year:
During the second year of the project, all WP2.5 participants will contribute to the following activities:

- continue the production of global and regional numerical simulations targeted to the regions of interest of the project;
- continue the provision of the contents of the numerical data archives, with a focus on the Mediterranean area, the Alpine region and the HKKH region;
- initiate the implementation of high-resolution, non-hydrostatic numerical models at the local scale, for simulating climate and environmental dynamics in mountain areas with complex orography;
- define the configuration of high-resolution simulations for specific areas in the Alps and in HKKH; collect and prepare input and validation data; obtain the first simulation results.
- continue the work on stochastic downscaling to investigate future high-resolution precipitation scenarios in north-western Italy.
- start the activities aimed at providing a comparison between different techniques of dynamical, statistical and stochastic downscaling, in order to understand their performance and applicability limits in specific case studies.
- start the generation of high-resolution data archives, using spatial and temporal downscaling techniques applied to output of observations and models.
- organize two meetings of the project researchers, to discuss climate scenario experiments and the distribution and use of the numerical data.

Deliverables:
D2.5.3: Archives of global climate simulations; transmission of information to the General Portal.
D2.5.4: Report on the results of the numerical simulations at the different scales and on their analysis.

WP 2.6 Pilot studies on data use, dissemination and project coordination

Second year:
Organization of two meetings of the researchers involved in the pilot studies, to assess progress and determine data storage strategies. Continuation of the formation activities and of the summer school on the mountain environment. “Mid term” meeting for the possible modification of some of the project strategies. Activation of a new call for pilot studies (in particular, on mountain ecosystems). General reports on the project activities in the second year, dissemination by public conferences and articles. A short documentary movie on climate change and the alpine ecosystems will be realized. Contacts with the private sector, to stimulate the use of the data collected during the project by industries and enterprises, will be activated. A general meeting of the researchers and personnel involved in the project will be organized. The meeting will be open to the groups which provided the data and to representatives of the scientific community and of the public and privare user community.
Continuation of the ongoing pilot studies on (a) analysis of water resources in the Himalaya-Karakorum and interaction between monsoon and mid-latitude perturbations; (b) analysis of the changes in terrestrial biodiversity in areas of high altitude in the north-western Italian Alps; (c) estimation of the changes in snow cover and the hydrological cycle of the Alps and the Apennines; (d) effect of aerosols in high altitude areas; (e) multi-secular historical climate simulation for the Mediterranean area and comparison with paleoclimatic

proxy data, to obtain a climatological history of Italy in the last one thousand years. Start of new pilot studies related to the special projects: (f) measurement and analysis of precipitation in high-elevation regions; (g) response of Alpine glaciers to climate change; (h) high-resolution climatological information for mountain areas for a 30-yr reference period; and (i) effect of climate change on Alpine plant species germination.

Deliverables:
D2.6.2: Report on the results of the pilot studies in the second year.

WP 2.7 General Portal for data access

Second year:
Definition of the technical characteristics of the General Portal (and of its digital infrastructure) for the publication and sharing (i.e. discovery, evalution, and access) of databases and archives generated during the project, and of the methods for the harmonization of the procedures for accessing the various sub-archives that will be included in the Portal. The General Portal infrastructure will be designed to assure a complete interoperability with significant initiatives and programmes for the NextData research area: GEOSS, INSPIRE, GMES, Belmount Forum, and others.
The NextData cyber(e)-infrastructure adopts a System of Systems approach based on a brokering architecture. The project includes three distinct phases and related milestones: (a) the first prototype of the NextData System of Systems infrastructure, implementing the core functionalities; (b) the consolidated version of the NextData System of Systems infrastructure, implementing advanced functionalities; (c) the final and operative NextData System of Systems infrastructure for data and information sharing and publication. The second year focuses on the design and development of the first version of the General Portal.
The General Portal will carefully consider actual issues, such as: transparency, open governance and innovation. It will provide access to open public data from NextData. It will also provide access to data of other projects, infrastructures, and agencies at their request. The published data can be downloaded by everyone interested to facilitate reuse, linking and the creation of innovative services. Moreover, the data portal will promote literacy about published data. The Open Data Access guidelines, under definition by Science Europe, will be considered and applied.

Deliverables:
D2.7.1: First version of the General Portal for data access.

APPENDIX - PROJECT MANAGEMENT

Project Coordinator:
Antonello Provenzale (CNR-ISAC)

Executive Committee:
Antonello Provenzale (CNR-ISAC, project manager)
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Elisa Palazzi (CNR-ISAC)
Logistic support:
Chiara Belotti (Ev-K2-CNR)
Letizia Congedi (CNR-ISAC)
Secretarial support:
Donatella Scaravaglio (CNR-ISAC)

Sub-project leaders:
Sp1: Paolo Cristofanelli (CNR-ISAC)
Sp2: Elisa Vuillermoz (URT EvK2-CNR)

Work Package coordinators:
WP1.1: Paolo Cristofanelli (CNR-ISAC)
WP1.2: Angela Marinoni (CNR-ISAC)
WP1.3: Nadia Pinardi (INGV)
WP1.4: Valter Maggi (DISAT-UNIMIB)
WP1.5: Fabrizio Lirer (CNR-IAMC)
WP1.6: Carlo Barbante (CNR-IDPA)
WP1.7: Antonello Provenzale (CNR-ISAC, *ad interim*)
WP2.1: Maria Teresa Melis (URT EvK2-CNR)
WP2.2: Claudia Fratianni (INGV)
WP2.3: Mattia De Amicis (DISAT-UNIMIB)
WP2.4: Luciana Ferraro (CNR-IAMC)
WP2.5: Silvio Gualdi (CMCC)
WP2.6: Antonello Provenzale (CNR-ISAC)
WP2.7: Stefano Nativi (CNR-IIA)

The Project Coordinator, Executive Committee members, sub-project leaders, WP coordinators, members of the scientific coordination support team, representatives of the (PNR) institutions participating in the project and responsibles of special projects who do not lead WPs constitute the Scientific Committee (Steering Committee) providing consultation to the Project Coordinator and Executive Committee.