



SEQS-DATESTRA A DATABASE OF TERRESTRIAL QUATERNARY STRATIGRAPHICAL SITES OF EUROPE: INQUA FUNDED INTERNATIONAL FOCUS GROUP 1620F SACCOM

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ABSTRACT: SEQS for the 2016-2019 Intercongress period aims to build a Database of Quaternary Terrestrial European Stratigraphic Sites (DATESTRA). DATESTRA follows the need for a concise, informative and easy to use system to share as many information as possible about the most important Quaternary sites across Europe. The main goal is to create a Database that summarize the litho-, bio-, pedo-, morpho- and chrono-stratigraphical data becoming a tool for cross-border correlations of the main Quaternary subdivisions in Europe, combining existing knowledge and expertise of regional specialists. The main outcome expected is a Database shared and made available to all the Quaternary audience on open GIS based Web platforms to give to the wider audience as possible, also at informative level, the chance to have an overview of the European Terrestrial Quaternary setting. At the next INQUA Congress (2019 Dublin, Ireland), DATESTRA ongoing works will be presented in a joint session with SEQS.

KEYWORDS: Quaternary, stratigraphy, key-sites, geographic database, Europe

1. INTRODUCTION

For the 2016-2019 INQUA Intercongress period, SEQS (INQUA Section on European Quaternary Stratigraphy) will aim to build a Database of Terrestrial European Stratigraphy (DATESTRA). This is a Database of the sites with stratigraphic importance from every country of Europe. DATESTRA is therefore an European Geographic Site-Stratigraphical Database that will continue the projects carried out by SEQS during the previous Intra-Congress periods when the main goal of the activities was across-Europe correlations (Pieruccini et al., 2016a; 2017a). However, in many Regions Quaternary stratigraphical schemes were developed using complex litho-, chrono-, and bio-stratigraphical criteria that made problematic the correlations in terrestrial Quaternary systems. This is also due to the fragmentary nature of these records and to the problems related to reliable dating techniques covering the full range of Quaternary time. Terminology defining the chrono-stratigraphical setting is often based on local or old-fashioned schemes and the need for a common language/terminology/methodology is strongly necessary in order to share among European Quaternary scientists basic geoscientific information. DATESTRA will summarize the main sites with Terrestrial Quaternary deposits in Europe trying to bypass their fragmentary nature and giving rapid access to the sections, techniques and methods used for their study. In order to set the regional names and subdivisions avoiding as much as possible the problems due to local terminology, DATESTRA will

focus on the main Quaternary stages as assessed by ICS-International Commission on Stratigraphy (Gelasian; Calabrian; Middle Pleistocene; Upper Pleistocene; Holocene) giving particular emphasis on the stage boundaries and transitions. This approach should give a summary and overview of the main characters of the subseries/stages across Europe.

DATESTRA aims to summarize the litho-, bio-, pedo-, morpho- and chrono-stratigraphical data that are fundamental for cross-border correlations, Quaternary mapping, climate changes reconstructions and natural hazards and related risks assessment. Moreover, creation of shared database is also among the main topics of Horizon 2020, the financial instrument implementing the Innovation Union-Europe 2020 flagship initiatives aimed at securing Europe's global competitiveness. The whole network of Quaternary scientists is warmly invited to participate to DATESTRA under the umbrella of INQUA-SEQS; SEQS is active since many decades, putting together a high number of Quaternary Scientists across Europe sharing knowledge and information annually through Meetings and regular publication of proceedings of these meetings on Quaternary International special issues (i.e. Zastrow et al., 2018). At the same time, ECR (Early Career Researchers) and DCR (Developing Countries Researchers) scientists are encouraged and granted to present and share during the SEQS annual Meetings the main Quaternary sites, together with their significance, for single countries or regions across Europe. In fact, during the SEQS Meetings, sessions are devoted to DATESTRA and the whole SEQS audience is

SITE

GROUPS OF ATTRIBUTES

| REGISTRY | STRATIGRAPHY | CORRELATION | DOCUMENTS |
|---------------------|--|----------------------------|--------------------|
| ATTRIBUTES | ATTRIBUTES | ATTRIBUTES | ATTRIBUTES |
| Site | Chronostratigraphy | Correlation with MIS | Document type_1 |
| Country | Geochronology | Correlation with MIS1_19 | Document file_1 |
| Region | Reliability of chronological attribution | Correlation with MIS19_31 | Path to document_1 |
| Long | Depositional Environment 1,2,3 | Correlation with MIS31_63 | Document type_2 |
| Lat | Unconformities | Correlation with MIS63_103 | Document file_2 |
| Compiler (1,2,3) | Biological proxies | | Path to document_2 |
| Institution (1,2,3) | Morphostratigraphy | | |
| Date | Lithostratigraphy 1,2,3 | | |
| Type | Pedostratigraphy | | |
| Preservation | Magnetostratigraphy 1,2,3 | | |

Fig. 1 - Scheme of the structure of DATESTRA Database with the description of the attributes for each site.

informed about the future actions to be taken (<http://datestra-seqs.strikingly.com/>) (Pieruccini et al., 2016a; 2017a). The SEQS Meetings in 2016 (Armenia) and 2017 (France) already recorded contributions by different countries of Europe (Danukalova et al., 2017a and b; Marks, 2017; Gerasimenko, 2017; Lefort et al., 2017; Korsakova & Kolka, 2017; Pieruccini et al., 2016b; 2017b)

2. STRUCTURE OF THE DATABASE

The Password for the Database is EASY; it means easy compilation, the compilers are invited to contribute providing basic information for each site, including basic bibliographic reference. The Database should serve to the end-user as a starting point for further and more detailed information. At first, DATESTRA should contain only key sites, such as historically known sites or the better stratigraphically significant and constrained sites from every country of Europe. The Database should also be easy to query; the end-user should be able to query and find the information needed, i.e. the chronostratigraphical interval and the dating method, the biostratigraphical proxy etc.

The structure of the Database is therefore conceived taking into account these objectives.

Each site has a number of attributes (and related

domains) and each attribute has a limited number of values, in order to make the Database as simpler as possible. The terminology of the values for each attribute have been uniformed based on the IQUAME 2500 Project dictionaries for the Quaternary Map of Europe.

The attributes are grouped under 4 main topics:

- Registry** - These attributes are related to the basic information about name of the site, Country, Region, Geographic coordinates, names and institutions of compilers, date of compilation, Type of site, State of preservation of the site.
- Stratigraphy** - These attributes are related to the basic information about the Chronostratigraphical attribution, Geochronological method for attribution, Reliability of the attribution, Depositional Environment, presence of Unconformities, Biological proxies, Morphostratigraphy, Lithostratigraphy, Pedostratigraphy and Magnetostratigraphy.
- Correlation** - These attributes are related to the correlation of the site with Climatostratigraphy or MIS. The MIS attribution is provided for MIS intervals as follows: MIS 1-19, if single; MIS1-19, 19-31, 31-65, 63-103 if intervals of MIS.
- Documents** - These attributes are related to the documents, and their path, attached to the table of the site, i.e. article, photo, table, log etc.

The structure and design of the Database was ini-

tially discussed among colleagues belonging to the AIQUA community (Italian Association for Quaternary Research) who also contributed with a preliminary compilation of Italian Quaternary sites. Then, these sites and the output on Story Maps (ESRI©) were presented to the SEQS community (Pieruccini et al., 2016c; 2017c).

3. DATESTRA OUTPUT AND EXPECTED RESULT

The main output of DATESTRA is an Open Access Database with a consistent number of Quaternary sites compiled for as many countries as possible of Europe. The Database will be an open-source tool that will work as a starting point for the European Quaternary Stratigraphy knowledge, to be implemented and updated by scientists that especially in the future could face problems with old terminology or old references about key-sites that in many cases disappeared or faded away in the memory.

The Database principles are that it must be: a) concise, containing very basic information but sufficient as starting point for further refined search; b) easy to compile, allowing with few and clear rules its compilation from people with different scientific backgrounds; c) easy to query, this is the crucial point for consultation and correlation across Europe. For each compiled site the compilers are asked to provide the table with attributes and values, a short text, few picture and the main references. The sites and related data will also be uploaded on web-GIS application like "Story Maps" (ESRI©) that allows all the queries in order to give a summary of the potentially correlated Quaternary sites across Europe. The goal for this Intra-Congress period is then to present the Database at INQUA Dublin 2019, to the wider audience as possible, opening the road to future actions like extra-European countries or more detailed or functional databases. For this purpose, SEQS already applied for a session also dedicated to DATESTRA.

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