

SUBCOMMISSION ON NEOGENE STRATIGRAPHY

ANNUAL REPORT 2013

1. TITLE OF CONSTITUENT BODY and NAME OF REPORTER

Subcommission on Neogene Stratigraphy (SNS)

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2. OVERALL OBJECTIVES, AND FIT WITHIN IUGS SCIENCE POLICY

The SNS is the primary body responsible for providing optimum clarity and stability in the Neogene Chronostratigraphic Scale by selecting and defining Global Stratotype Sections and Points (GSSPs) for Series and Stages.

3. CHIEF ACCOMPLISHMENTS AND PRODUCTS IN 2013

Nomination of new Voting and Corresponding Members

Some modifications to the voting member and corresponding member lists have been made, due to the unavailability of some members to actively participate and contribute (*see Appendix for full list voting and corresponding members*).

Burdigalian and Langhian GSSPs working group

Frits Hilgen is the new chair of the working group for the remaining GSSPs, base-Langhian and base-Burdigalian. The change of the members of this working group is upcoming, and will be promptly conveyed.

Update of the studies for defining the Langhian GSSP

The base of the Langhian and thus the Lower-Middle Miocene boundary is widely accepted to be approximated by the *Praeorbulina* datum and a position close to Chron C5Cn, in agreement with common and consolidated practise. However, the historical stratotype at Cessole with terrigenous and turbiditic sediments in its lower part is less suitable for defining the GSSP. For that reason, two potentially suitable sections for defining the Langhian GSSP were selected in the Mediterranean, namely the downward extension of the La Vedova beach section in northern Italy and St. Peter's Pool on Malta, within an Italian research project (PRIN 2006 - prot. 2006047534 - "In search of the

Global Stratotype Sections and Points of the Burdigalian and Langhian Stages and paleoceanographic implications”).

Research papers directed at selecting the most suitable section and guiding criterion for defining the Langhian GSSP were published in a special volume of Stratigraphy in 2011. These papers dealt with the integrated magnetobiostratigraphy (Iaccarino et al., 2011; Turco et al., 2011). Ongoing studies are focussed on the stable isotope stratigraphy, and cyclostratigraphy and astronomical tuning of these sections. These are considered important criteria for defining GSSPs in the Neogene. The younger La Vedova beach section has been studied in detail and an astronomical tuning established (Hüsing *et al.*, 2010). Also the downward extension covering the interval for defining the GSSP looks promising from an orbital tuning perspective (Iaccarino *et al.*, 2009). A preliminary astronomical tuning and astrobiochronology have been established for the alternative St. Peter’s Pool section on Malta (Lirer *et al.*, 2009). Evidently, both sections have their strong and weak points and are complementary to each other, with La Vedova having a higher quality magnetostratigraphy and St. Peter’s Pool a better preservation of the calcareous plankton. The latter is important for biostratigraphy and stable isotopes.

Moreover, in 2013 these sections have been extended further into the Burdigalian.

3b. No major publications of subcommission work

3c. CHIEF PROBLEMS ENCOUNTERED IN 2013

As already stated in the previous 2012 Report, a problem that remains is the possible lack of suitable sections in the Mediterranean for defining the Burdigalian GSSP. This is certainly the case if we prefer to have the Burdigalian GSSP defined in an astronomically tuned deep marine section in the Mediterranean that directly underlies the geologic time scale. The SNS chair will suggest to the new members of Langhian/Burdigalian WG to take into consideration the alternative option to have this boundary defined in (I)ODP cores. Hopefully, a decision about this issue should be made in the coming years.

4. OBJECTIVES AND WORK PLAN FOR NEXT YEAR (2014):

The study of the two potential boundary stratotype sections of La Vedova and St. Peter’s Pool for defining the Langhian GSSP will be continued and focus on the astronomical tuning of the sections and the construction of a stable isotope record for St. Peter’s Pool. It is anticipated that a workshop will be held as soon as the two studies will be completed. Following these studies a decision regarding which section and criterion are most suitable for defining the Langhian GSSP should be possibly made in 2014. The search for suitable sections and/or cores for defining the Burdigalian GSSP will continue.

5. SUMMARY OF EXPENDITURES IN 2013:

Credit on Nov 2012	Euro	3968,35
Credit on Nov 2013	Euro	4610,74

6. BUDGET REQUESTS AND ICS COMPONENT FOR 2014

Field trip to suitable section for the definition of base-Burdigalian	Euro 1500
Website updating	Euro 500

APPENDIX

7. SUMMARY OF MAIN ACCOMPLISHMENTS OVER PAST FIVE YEARS (2009-2013)

2009

Publication of papers by members of SNS on the Quaternary issue (Aubry et al., 2009; McGowran et al., 2009; Van Couvering et al., 2009). Publication in Episodes about the formal definition of the Serravallian GSSP (Hilgen et al., 2009). Ongoing research on La Vedova and St. Peter's Pool sections.

2010

Preparation of several papers on the two candidate sections for defining the Langhian GSSP for publication in a special volume of Stratigraphy, on the historical stratotype of the Langhian, and on the taxonomic concept of *Praeorbulina*.

2011

Publication of papers about potential Langhian GSSP sections in a special volume of Stratigraphy. Preparation of the Neogene chapter (ATNTS2012) of the GTS2012 (Hilgen et al., 2012, in press).

2012

Publication of the Neogene chapter ATNTS2012 in GTS2012 (Hilgen et al., 2012). Publication of a new Neogene calcareous nannofossil zonation (Backman et al., 2012).

2013

Presentation of a new Paleogene calcareous nannofossil zonation at the STRATI 2013 Congress in Lisbon (by I. Raffi et al.). The paper will be submitted for publication before the end of 2013.

8. OBJECTIVES AND WORK PLAN FOR NEXT 2 YEARS (2014-2015)

Organization of a workshop on the selection of boundary criteria and sections for defining the 2 remaining stage boundaries in the Miocene, namely the base-Langhian and the base-Burdigalian. Potentially suitable sections in the Mediterranean region that may serve as Langhian GSSP have been identified (La Vedova; St. Peter's Pool). Crucial questions to be addressed during the work-

shop are: 1) which section is most suitable to be proposed as Langhian GSSP, 2) which prime guiding criterion should be selected, and 3) should we abandon the ambition of having the Burdigalian GSSP directly tied within an astrochronologic framework in order to have the GSSP defined in a Mediterranean land-based section, or should we define this GSSP in drilled ODP sequences at Ceara Rise or any other tuned sequence drilled by (I)ODP.

Selection of most suitable section/ODP core and guiding criteria for defining the Langhian and Burdigalian GSSPs, and writing of proposals for the Langhian and Burdigalian GSSPs in 2014-2015.

9. ORGANIZATION AND SUBCOMMISSION MEMBERSHIP

The SNS is a subcommission of the ICS, founded in 1971. Reference is made to the annual report of 1995 for a brief historical resume of the SNS. The subcommission has four regional committees (Mediterranean, Pacific, Atlantic and Nordic) and keeps close contacts with the Russian Neogene Commission chaired by Prof. Yuri B. Gladenkov. Apart from the executive bureau, the SNS has 22 voting members and 24 corresponding members (*see Appendix for full list of officers and voting and corresponding members*). The SNS has presently one active working group for defining the GSSP remaining for the Langhian and Burdigalian chaired by Frits Hilgen. The change of the members of this working group is upcoming, and will be promptly conveyed. The SNS web site (www.sns.unipr.it) is under renovation and will be published within December 2013. Support for the SNS comes from the Chairman's Institution in Italy (Università degli Studi "G. d'Annunzio di Chieti-Pescara). The Secretary's Institution in Parma (Università degli Studi di Parma) will host the SNS web-site.

9a. CURRENT OFFICIERS, VOTING AND CORRESPONDING MEMBERS

Subcommission officers (from August 1, 2012)

Chairman: Isabella Raffi, Dipartimento di Ingegneria e Geologia, Università degli Studi "G. d'Annunzio" di Chieti-Pescara, Campus Universitario, Via dei Vestini 31, 66013 Chieti Scalo, Italy. E-mail: raffi@unich.it

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Secretary: Elena Turco, Dipartimento di Fisica e Scienze della Terra "Macedonio Melloni", Università degli Studi di Parma, Parco Area delle Scienze 157A, 43124, Parma, Italia. Email: elena.turco@unipr.it

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9c. INTERFACES WITH OTHER INTERNATIONAL PROJECTS

There is a close link with (I)ODP because of its important role in the development of integrated time scales for the Neogene, in testing the global correlation potential of bio-events, and in a better understanding of climate and ocean history during this time span.

There is even a link with the activity of the EARTHTIME-EU Research Networking Programme (RNP), that is part of a broader international initiative “EARTHTIME: a community-based scientific effort aimed at sequencing Earth history through an integrated geochronologic and stratigraphic approach”.

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