

SUBCOMMISSION ON NEOGENE STRATIGRAPHY

ANNUAL REPORT 2005

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. ORGANIZATION

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 20 voting members and 38 corresponding members (*see Appendix for full list of officers and voting members*). The SNS has presently 3 working groups: 1) WG on Miocene Time Scale chaired by Nick Shackleton, 2) WG for defining GSSP sections for the Tortonian and Serravallian chaired by Frits Hilgen, and 3) WG for defining GSSP sections for the Langhian and Burdigalian chaired by Isabella Raffi. The SNS web site (www.geo.uu.nl/SNS) is used for news release and contains the following sections: Home, News, Board, Members, Newsletters, GSSP's, and Links.

3a. Officers for 2004-2008:

Chair: Frits Hilgen, Utrecht, The Netherlands

Vice-Chairs: Francisco Javier Sierro, Salamanca, Spain
David Hodell, Florida, USA

Secretary: Elena Turco, Parma, Italy

Support for the SNS comes from the Chairman's Institute (Faculty of Geosciences, Utrecht University). This institute also hosts the SNS web-site.

4. 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.

5. CHIEF ACCOMPLISHMENTS AND PRODUCTS IN 2005

The integrated stratigraphy and astronomical tuning of the Ras il Pellegrin section on Malta, the prime GSSP candidate for the Langhian-Serravallian boundary, has now been published (Abels et al., 2005. *Paleoceanography*). This publication follows significant publications by Italian research groups in the “*Rivista Italiana di Paleontologia e Stratigrafia*” in 2002 (vol. 108). Uncertainties in the tuning of the upper Blue Clay part of the section have been reduced to ± 1 precession cycle due to optimizing the cyclicity using chemical element analysis and by calibrating the Maltese section to the partly time-equivalent and well-tuned Italian sections of Monte dei Corvi and Tremiti. The Ras il Pellegrin section in addition yielded a good magnetostratigraphy that can reliably be calibrated to the GPTS while the excellent preservation of the calcareous microfossils will allow the retrieval of first rate stable isotope data. High-quality carbonate and (bulk) stable isotope records have already been published by Abels et al. (2005), and by John and others (*Geol. Soc. Am. Bull.*, v. 115, 2003) for parallel sections located on the nearby island of Gozo. These records allow the straightforward identification of the main mid-Miocene oxygen isotope shift (Mi-3b) towards heavier values across the formation boundary between the Globigerina Limestone and Blue Clay. The new tuning indicates that the event corresponds to the marked coincidence of minimum amplitude variations in obliquity related to the 1.2 myr cycle and minimum eccentricity related to the 400-kyr cycle (Abels et al., 2005). This Mi-3b event is proposed to serve as the prime criterion to delineate the boundary. A proposal to define the Serravallian GSSP at the base of the Blue Clay in the Ras il Pellegrin section on Malta is presently being written and will be completed by January 2006.

Participation of the SNS chair in the Task Force on the Quaternary definition. Related to the Task Force contribution, a questionnaire about the status and rank of the Quaternary sent to the SNS members in preparation of the ICS workshop in Leuven was another important product. The outcome was evident with a vast majority of the members accepting the compromise proposal published by Aubry et al. (2005, *Episodes*) with the Quaternary as a Subera covering the last 2.6 Ma and the Neogene as a Period extending to the recent.

Participation of the SNS chair in the ICS workshop in Leuven and presentation of the Neogene view on Unit-Stratotypes for Global Stages. A paper on this approach has been accepted for publication in *Earth Science Reviews*

6. CHIEF PROBLEMS ENCOUNTERED IN 2005

The frustrating settlement of the Quaternary issue after the formal voting and clear outcome at the ICS workshop in Leuven. Evidently the SNS does not have the intention to put more effort in this issue.

An important signaled problem is the possible lack of suitable sections in the Mediterranean for defining the remaining Neogene GSSPs, namely the Langhian and Burdigalian GSSP. This is certainly the case if we prefer to have the boundaries defined in astronomically tuned deep marine sections that underlie the geologic time scale. One potentially suitable section for the Langhian has been identified, namely the La Vedova section near Ancona. However, it will cost a considerable amount of research effort and money before this section has been studied in sufficient detail to be promoted as Langhian GSSP. In addition the section will only be studied if it is also interesting from other points of view than a GSSP (e.g., astronomical time scale, paleoceanography). The option to have these boundaries defined in ODP cores is presently under study.

7. SUMMARY OF EXPENDITURES IN 2005 (ANTICIPATED THROUGH MARCH 2006):

Credit on July 2005	Euro 4865
Contribution 2005 ICS to SNS	Euro 1500?? (\$ 1900)
<i>Expenditures</i>	
Contribution 2004 SNS to RCNPS	Euro 300
Contribution 2004 SNS to RCMNS	Euro 300
Finalizing measuring and sampling of candidate section base-Serravallian on Malta (late 2005)	Euro 1500

8. WORK PLAN, CRITICAL MILESTONES, ANTICIPATED RESULTS AND COMMUNICATIONS TO BE ACHIEVED NEXT YEAR (2006):

The formal proposal to define the Serravallian GSSP at the formation boundary between the Globigerina Limestone and the Blue Clay in the Ras il Pellegrin section on Malta will be submitted to SNS voting members in the beginning of 2006.

Intensification of the search for suitable sections/cores to define the remaining GSSPs of the Langhian and Burdigalian. A pilot study of the La Vedova section, a potential candidate for the Langhian GSSP, will be carried out to see whether the section is suitable for establishing a reliable magnetostratigraphy. Although preservation is not perfect, the section is suitable for establishing a high-resolution calcareous plankton biostratigraphy.

9. BUDGET AND ICS COMPONENT FOR 2006

Organization workshop on base-Langhian and base-Burdigalian	Euro 1500
Optional: Fieldtrip to the Ras il Pellegrin section on Malta	Euro 1500
Field trip to La Vedova (base-Langhian)	Euro 1000
Contribution 2004 to RCPNS and RCMNS	Euro 600

10. SUMMARY OF CHIEF ACCOMPLISHMENTS OVER PAST FIVE YEARS (2001-2005)

See Accomplishments in 2005 (above) for additional details.

2001

Establishment of WG for base Tortonian and Serravallian (chaired by F.J.Hilgen)

Establishment of WG for base Langhian and Burdigalian (chaired by I. Raffi)

Launching of the SNS web-site

2002

Base-Tortonian field workshop in Italy. Agreement that Monte dei Corvi section near Ancona is the best choice for a Serravallian-Tortonian boundary section. Completion of Tortonian GSSP proposal.

2003

Ratification by IUGS of Tortonian GSSP at the midpoint of the sapropel of basic cycle 76 in the Monte dei Corvi section (northern Italy).

2004

Publication of a revised Neogene Time Scale (Lourens et al., 2004 in Gradstein et al., 2004. Geologic Time Scale 2004. Cambridge University Press, ~500 pages).

11. OBJECTIVES AND WORK PLAN FOR NEXT 4 YEARS (2005-2008)

Submission of proposal for the Serravallian GSSP in 2006.

Organization of a workshop on the selection of boundary criteria and sections for the definition of the 2 remaining Miocene stage boundaries, namely the base-Langhian and base-Burdigalian. Suitable sections in the Mediterranean region that may serve as GSSP sections for these boundaries have not yet been identified although the La Vedova might be a suitable candidate for the Serravallian GSSP. Most candidate sections specifically fail in the matter of potential for astronomical tuning. A crucial question to be answered during the workshop(s) is whether we should abandon the ambition of having also these GSSPs directly tied within an astrochronologic framework and having these GSSPs defined in land-sections without possibilities of tuning or whether we should have these GSSPs defined in the drilled sequence at Ceara Rise or any other tuned sequence drilled by (I)ODP.

APPENDIX [Names and Full Addresses of Current Officers and Voting Members]

Subcommission officers

Chairman: Frederik J. Hilgen, Faculty of Geosciences, Utrecht University, P.O. Box 80021, 3508 TA Utrecht, The Netherlands, e-mail: fhilgen@geo.uu.nl

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Secretary: Elena Turco, Dipartimento di Scienze della Terra, Università degli Studi di Parma, Parco Area delle Scienze 157, 43100, Parma, Italia. Email: elena.turco@unipr.it

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