

# SUBCOMMISSION ON NEOGENE STRATIGRAPHY

ANNUAL REPORT 2015

## 1. TITLE OF CONSTITUENT BODY

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.

### 3a. CHIEF ACCOMPLISHMENTS AND PRODUCTS in 2015

#### Meeting of the Subcommission on Neogene Stratigraphy

A meeting of the Subcommission on Neogene Stratigraphy was held during the STRATI 2015 Congress in Graz (July 22, 2015). It was open to anyone interested and included a workshop of the “Burdigalian-Langhian” Working group, entitled: **“The unsettled GSSPs in the Miocene: toward completion?”**. Besides focusing on the topic related to Budigalian and Langhian GSSPs (details are reported below), discussion took account of the ongoing debate about “formal and informal stratigraphic units, sub-epoch/sub-series” (arisen during the ICS open assembly held in the conference) and about the proposed use of “Tertiary” as Period/System in place of Paleogene and Neogene.

#### The Budigalian and Langhian GSSPs

A working group for the definition of the remaining Miocene GSSPs base-Langhian and base-Budigalian (BurLan WG) was set up during 2014-2015, with Frits Hilgen acting as chair and the following designated members: W. Beggren, J. Channell, A. Di Stefano, L. Foresi, A. Holbourn, S. Iaccarino, F. Lirer, K. Miller, P. Pearson, I. Raffi, E. Turco.

During the meeting of the WG (held during the STRATI 2015, with participation of some of the voting and corresponding members of SNS, besides members of the WG itself) there was a series of introductory talks and updated reports on the “state of the art”, including: Introduction to the Langhian GSSP (by F. Hilgen, chair of “BurLan” WG); the *Praeorbulina* datum (by E. Turco);

Presntation of the two Mediterranean candidate sections, La Vedova (by E. Turco) and St. Peter's Pool (by L. Foresi and F. Lirer); Introduction to the Burdigalian GSSP (by A. Di Stefano); the Langhian and Burdigalian GSSPs from (I)ODP perspective (by F. Hilgen). Detailed report on the results of discussion during the WG meeting will be published on the SNS website.

### **Election of new board**

In October-November 2015 the SNS voting members were asked to vote for a new board of SNS, active for the 2016-2020. Prof. Isabella Raffi (as chair) and Prof. Kenneth Miller (as vice-chair) have been willing to run for it once again. Results of the election will be available at the end of November 2015.

**3b.** List of major publications of subcommission work (books, special volumes, key scientific paper)  
No major publications available.

### **3c. CHIEF PROBLEMS ENCOUNTERED IN 2015**

During the meeting of the "BurLan" WG, a clear problem arose regarding the guiding criteria for the definition of Langhian GSSP, although two good candidate stratigraphic sections are available. A more reliable (correlatable) criterium for recognizing the Langhian GSSP (e.g. top of magnetic polarity Chron C5Cn) should be preferred to the "historical" one, the *Praeorbulina* datum, because of substantial rarity and the controversial taxonomic concepts of this bioevent. However, it has been underlined that emphasis on the biostratigraphic value of the *Praeorbulina* lineage, in the Langhian interval, and its importance for chronology and correlation has to be placed.

As regards the Burdigalian GSSP, a recurrent problem is the possible lack of suitable sections in the Mediterranean for its definition. 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 alternative option to have this boundary defined in (I)ODP cores is being seriously considered by the Working Group on the Langhian and Burdigalian GSSPs, and a decision about his issue will probably be made the coming year.

### **4a. OBJECTIVES AND WORK PLAN FOR NEXT YEAR (2016)**

The constructive discussion within the WG for Burdigalian and Langhian GSSPs lead to delineate a program to reach an agreement for a Langhian GSSP proposal, either for proposing a reliable/reproducible guiding criterium, complemented by additional criteria useful for correlation, and for deciding on the GSSP section. The research groups involved in the proposals will be asked to complete their studies and submit proposals within the 2016. Priority will be given to organization of a meeting of the WG to visit the candidate section(s).

The search for suitable sections and/or cores for defining the Burdigalian GSSP will continue. In absence of suitable Mediterranean sections for defining the Burdigalian GSSP, the option to formally designate this boundary in an ODP core would be seriously considered.

### **4b. Specific GSSP focus for 2016**

(See sub-chapter above)

## 5. SUMMARY OF EXPENDITURES IN 2015:

Credit on Nov 2014	Euro	5494,74
Expense for registration at STRATI 2015 for Chair I.Raffi and Secretary E.Turco	Euro	600,00
Expense for participation at STRATI 2015 for vice-chair K. Miller	Euro	1000,00
Credit on Nov 2015	Euro	3894,74

## 6. BUDGET REQUESTS and ICS COMPONENT for 2016

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

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## APPENDIX

### 7. SUMMARY of CHIEF ACCOMPLISHMENTS over PAST FIVE YEARS (2011-2015)

#### **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).

#### **2013**

Presentation of ongoing work on Biozonation and biochronology of Cenozoic calcareous nannofossils from low and middle latitudes at the conference: "Geologic Problem Solving with Microfossils 2013" (NAMS-SEPM organiz., Houston March 2013) (by Raffi et al.).

Presentation of a new Paleogene calcareous nannofossil zonation at the STRATI 2013 Congress in Lisbon (by I. Raffi et al.).

#### **2014**

Talk at the Congress of Italian Geological Society (SGI-SIMP) in Milan (September 2014) about: "The Italian contribution to the definition of the ICS timescale: ongoing research" (by I. Raffi and coauthors M. Balini and S. Monechi).

#### **2015**

*Abstracts and talks during STRATI 2015 Congress:*

Principles and protocols of biostratigraphy as applied to marine calcareous microfossils. In: STRATI 2015, 2<sup>nd</sup> International Congress on Stratigraphy, Graz, 19-22 July 2015. Session S26 - Testing the time scale: quantitative and high-resolution calibration of Cenozoic biostratigraphic events (P.N. Pearson, B. Wade, I. Raffi, J. Backman, and members of the *EU-Earthtime* consortium)

The role of calcareous nannofossils during the last ~ 220 million years of Earth history. . In: STRATI 2015, 2<sup>nd</sup> International Congress on Stratigraphy, Graz, 19-22 July 2015. Session S01 - The contribution of fossils to Chronostratigraphy, 150 years after Albert Oppel (C. Agnini, E. Erba, S. Monechi, I. Raffi\*)

Success and Failure in Paleogene-Neogene global correlations using golden spikes. . In: STRATI 2015, 2<sup>nd</sup> International Congress on Stratigraphy, Graz, 19-22 July 2015. Session 25 – Neogene Stratigraphy – Integrating global and regional Chronostratigraphy. (K. Miller, M-P Aubry, W.A. Berggren, I. Raffi, D.V. Kent)

Astronomical tuning of the La Vedova section (Ancona, Italy) between 15 and 16.2 Ma. Implications for the origin of the megabeds and the Langhian GSSP. In: STRATI 2015, 2<sup>nd</sup> International Congress on Stratigraphy, Graz, 19-22 July 2015. Session 25 – Neogene Stratigraphy – Integrating global and regional Chronostratigraphy. (E. Turco\*, C, S. Husing, F. Hilgen, A. Cascella, R. Gennari, S.M. Iaccarino, L. Sagnotti)

Mediterranean Neogene planktonic foraminifer biozonation and biochronology. In: STRATI 2015, 2<sup>nd</sup> International Congress on Stratigraphy, Graz, 19-22 July 2015. Session S26 – Testing the time scale: quantitative and high-resolution calibration of Cenozoic biostratigraphic events. (F. Lirer, L-M- Foresi, S.M. Iaccarino, G. Salvatorini, E. Turco, A. Caruso, F.J. Sierro, C. Cosentino).

## **8. OBJECTIVES AND WORK PLAN FOR NEXT 4 YEARS (2016-2019)**

The constructive discussion within the WG for Burdigalian and Langhian GSSPs lead to delineate a program to reach an agreement for a Langhian GSSP proposal, either for proposing a reliable/reproducible guiding criterium, complemented by additional criteria useful for correlation, and for deciding on the GSSP section. The research groups involved in the proposals will be asked to complete their studies and submit proposals within the 2016. A priority will be the organization of a meeting of the WG to visit the candidate section(s).

As regards the thorny issue of the Burdigalian GSSP, critical questions are: 1) 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, or 2) should the Burdigalian as Stage denotation be disused because no suitable onland stratigraphic sections are available.

Proposal(s) for the Langhian GSSP will be submitted and published, with the purpose of reaching a final decision within the WG and subsequently within the SNS Subcommittee. A report of discussion about Burdigalian GSSP issue will provide the state of the art on it.

## 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, with 11 active members (listed below - section 9a). The SNS web site ([www.sns.unipr.it](http://www.sns.unipr.it)) is used for news release and contains the following sections: Home, News, Board, Members, Newsletters, GSSP's, and Links.

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) hosts the SNS web-site.

### 9a. CURRENT OFFICERS, VOTING AND CORRESPONDING MEMBERS

#### *Subcommission officers (Term 2012-2015)*

**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: [isabella.raffi@unich.it](mailto:isabella.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](mailto: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 has been 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”.