

SUBCOMMISSION ON PERMIAN STRATIGRAPHY

ANNUAL REPORT 2012

1. TITLE OF CONSTITUENT BODY and NAME OF REPORTER

International Subcommittee on Permian Stratigraphy (SPS)

Submitted by:

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2. OVERALL OBJECTIVES, AND FIT WITHIN IUGS SCIENCE POLICY

Subcommission Objectives: The Subcommittee's primary objective is to define the series and stages of the Permian, by means of internationally agreed GSSP's, and to provide the international forum for scientific discussion and interchange on all aspects of the Permian, but specifically on refined regional correlations.

Fit within IUGS Science Policy: The objectives of the Subcommittee involve two main aspects of IUGS policy: 1. The development of an internationally agreed chronostratigraphic scale with units defined by GSSP's where appropriate and related to a hierarchy of units to maximize relative time resolution within the Permian System; and 2. Establishment of framework and systems to encourage international collaboration in understanding the evolution of the Earth during the Permian Period.

3a. CHIEF ACCOMPLISHMENTS AND PRODUCTS IN 2012

Progress was made on the three remaining Lower Permian (Cisuralian) stage GSSPs including base-Sakmarian, base-Artinskian, and base-Kungurian, but none has been voted yet. An SPS business meeting on the candidates of the Kungurian-base GSSP was held on the 8th of June, 2012 at Wells, Nevada, USA under the support of ICS. All of the executive and five voting members attended the workshop. Seven attendees gave talks on the progress of the Kungurian GSSP candidates including the new Mechetlino section in southern Urals, Russia and the Rockland section in the Pequop Mountains in Nevada, USA. After an extensive discussion, SPS decided to complete a proposal including both the Mechetlino section in Urals and Rockland section in Nevada in near future and now one proposal for the Kungurian-base GSSP has been received.

3b List of major publications of subcommission work (books, special volumes, key scientific paper)

There is no *Permophiles* published in 2012 so far. We received fewer contributions from our Permian colleagues recently. However, we have planned to

publish one issue of *Permophiles* before the end of November, 2012 if we can get the Kungurian-base GSSP proposal shortly. There are two key recent scientific papers which are very useful to refine the Permian timescale. One is published on Science by Shen et al. (2011), among which 29 high-precision geochronologic ages in the Permian-Triassic transition with high-resolution biostratigraphy were reported. According to this paper, the Permian-Triassic boundary is dated as 252.17 Ma and the Wuchiapingian/Changhsingian boundary is 252.14 Ma. Another important paper is published on GSA Bulletin by Schmitz and Davydov (2012). High-precision geochronologic ages for the Cisuralian in southern Urals were published. The Carboniferous/Permian boundary is dated as 298.9 Ma, the Sakmarian-base is 295 Ma, the Artinskian-base is 290.1 Ma and the Kungurian-base is 282 Ma. All those ages are from the candidate of the Sakmarian-base GSSP section (Usolka) and the candidate of the Artinskian-base GSSP section (Dalny Tulkas) in southern Urals.

3c. Problems encountered, if appropriate

There were no major problems in 2012, but progress on remaining GSSP proposals is slow. A new potential problem is that the Lopingian-base GSSP established in 2005 at the Penglaitan section on the bank of the Hongshui River in Guangxi Province, South China is in danger to be flooded because the Chinese government has planned to establish a dam for electricity at a place about 150 km downstream to Penglaitan. However, the situation regarding how high the water level in the reservoir will become is still not very clear yet. SPS may seek ICS document support to ask a solution to protect the GSSP. We will send a report about this problem to the Chinese government.

4a. OBJECTIVES AND WORK PLAN FOR NEXT YEAR (2013)

The primary objectives are to complete the GSSP's for the last three GSSP's (Sakmarian, Artinskian, and Kungurian stages). We will produce one or two issues of *Permophiles* in 2013 depending on how many contributions we will receive. We anticipate the following schedule:

1. Complete both proposals and vote on base-Artinskian and base-Kungurian GSSPs in 2013.
2. Anticipate a proposal for base-Sakmarian GSSP candidate, voting is anticipated in 2013.
3. Two business meetings respectively at Albuquerque, New Mexico, USA in May 20-22, 2013 during the symposium on Carboniferous-Permian Transition and at Lisbon in early July, 2013 during the International Congress on Stratigraphy.

4b. Specific GSSP Focus for 2013

The priority of 2013 for GSSP is voting for the Kungurian-base GSSP. The Artinskian-base and Sakmarian-base GSSPs will be followed for voting in 2013. In addition, we will organize an international group to do a joint field excursion on the Guadalupian Series in West Texas. The purpose of this field excursion is to work on the conodonts, high-resolution geochemistry and to collect ash beds and possible

magnetostratigraphic samples. The three GSSPs of the Guadalupian Series were established more than 10 years ago. No GSSP paper has been published yet and the defined FAD conodonts have never been formally figured and there are no markers established at the GSSPs. Chemostratigraphy is basically not available. In order to meet the basic requirement of GSSP in the current sense, the planned work is essential for the GSSP paper.

5. SUMMARY OF EXPENDITURES IN 2012

The Kungurian Workshop was held following the plan last year. More than 10 international colleagues attended the meeting. The fund from ICS has been spent on paying airfare for a few colleagues from Russia and the United States, subsidizing 2 night's accommodation and meals of all participants in Wells and vehicle rentals for field work in Nevada to see candidate of the Kungurian-base GSSP. ICS provided \$7500 (US\$) to SPS in 2012 to cover costs of Kungurian Workshop and partial costs for the Brisbane IGC meeting. Total costs for Kungurian Workshop were \$6900.17 (Can\$; currently on par with US\$). Remaining funds subsidized accommodation of Shen and Henderson in Brisbane.

6. BUDGET REQUESTS AND ICS COMPONENT FOR 2013

- 1) Establishing a new SPS webpage: US\$1270. This is already completed (see links at ICS webpage).
- 2) Supporting Lucia Angiolini (new SPS secretary) to Nanjing in February, 2013 for Permophiles: US\$1500.0
- 3) A part of travel cost to Lisbon for International Congress on Stratigraphy, US\$1500.0

In total: US\$4270.00

APPENDICES

7. CHIEF ACCOMPLISHMENTS OVER PAST FIVE YEARS (2008-2012)

- 1) A new executive committee of SPS has been elected and nominated. Shuzhong Shen was elected as the new chair, Joerg Schneider was elected as the new vice-chair and Lucia Angiolini was nominated as the new secretary of SPS. Four voting members have been replaced by new members.
- 2) A high-resolution timescale of the Permian system is significantly refined by two recent papers (see SPS webpage Permian Timescale).
- 3) SPS decided to search new GSSP candidate for the Kungurian Stage after an investigation on the previous candidate. Now two candidates for the Kungurian-base GSSP are available.
- 4) Significant progress on the Sakmarian-base and Artinskian-base GSSP candidates has been made. Proposals for voting will be prepared soon.
- 5) A monument and a protected area is established at Penglaitan, Laibin, Guangxi Province, China for the Wuchiapingian-base GSSP.
- 6) 5 formal issues and two supplementary issues of Permophiles were published since 2008.

8. OBJECTIVES AND WORK PLAN FOR NEXT 4 YEARS (2013-2017)

- 1) Establishing the three GSSPs for the Cisuralian.
- 2) Establishing a working group on the Guadalupian and global correlation for chemostratigraphy and geochronologic calibration.
- 3) Developing a large working group on the correlation between marine and continental sequences. This has already been initiated.

9. ORGANIZATION AND SUBCOMMISSION MEMBERSHIP

9a Names and Addresses of Current Officers and Voting Members

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9b List of Working (Task) Groups and their officers

- 1) Kungurian-base GSSP Working Group; Chair-Bruce Wardlaw.
- 2) Sakmarian-base and Artinskian-base GSSPs Working Group; Chairs-Valery Chernykh and Boris Chuvashov respectively.
- 3) Guadalupian Series and global correlation; Chair-Charles Henderson.
- 4) Correlation between marine and continental Permian System; Chair-Joerg Schneider.
- 5) Neotethys, Paleotethys, and South China correlations; Chaired by Lucia Angiolini and Yue Wang.

9c Interfaces with other international project

SPS interacts with many international projects on formal and informal levels. SPS has taken an active role on the development of a project on the correlation between marine and continental Permian sequences bilaterally supported under the foundation

of the Sino-German Centre for Research Promotion (SGCRP) by NSFC and DFG. SPS is also involved in a NSFC supported key study of major biological events in the Palaeozoic. Shuzhong Shen and Yue Wang are concentrating on establishing a section-based Permian database in Geobiodiversity Database.