



ICS Officers and Subcommission chairs

A remote working meeting of the officers and chairs of the subcommissions was held on the 25 February 2022.

The meeting took place on 25 February 2022 at 13:00 GMT.

AGENDA

Chair: ICS Chair D. Harper (DH)

1. Introduction.

DH introduced the meeting by thanking everyone who attended. He pointed out the continuing excellent productivity of ICS subcommissions over the past year or so, despite the restrictions imposed by the Covid pandemic. He noted that it is now halfway through the IGC inter-congress period.

2. Report from the Executive.

DH noted that this has again been a productive period that has seen approval of two GSSPs from subcommissions and the subseries/subepoch units incorporated into the *International Stratigraphic Guide* by the end of the year 2021. We have also seen the restructuring of the website and updating of the International Stratigraphic Chart.

Next he noted that he has to attend the IUGS Executive meeting in Paris in March to report on progress and to defend the budget for the next tranche of money allocations.

Next Stuart Jones (SJ, the Treasurer) reminded subcommission chairs of the need for fully justified statements for requests for funding to accompany annual reports. These applications should be made by completing as fully as possible the spreadsheets circulated with the request for annual reports. Requests for payments should be made by September of each year and no later.

He also noted that funds for exceptional 'special projects' were available and asked chairs to submit requests to him ideas that would be assessed by the Executive on a case by case basis.

3. Reports from the Subcommissions.

Each subcommission chair (or alternate) attending presented a short report on GSSPs and associated projects that are in progress and are nearing completion. All subcommissions reported that the impact of the Covid pandemic has continued to prevent members from meeting face-to-face for discussions, and field excursions, etc.

- (i) Timescale Subcommission. Brad Cramer (chair ISTC) reported that subcommission members had been closely co-operating with the Permian Subcommission on developing a timescale calibration for the period. Secondly, he noted that the subcommission was developing the Cyclostratigraphy Intercomparison Project (CIP) in their creation of online learning resources and tools for researchers and teachers of cyclostratigraphy. Finally, he noted that it was likely that the timescale for the Cenozoic and the pre-Cenozoic would be determined by Bayesian statistics.
- (ii) Stratigraphic Classification. Werner Pillar (chair ISSC) began by reporting that the Subcommission's proposal on the formal acceptance of subseries/subepoch divisions was ratified in May 2021. Following this, subseries/subepoch had been formally proposed and ratified for the Neogene. He also noted that the consistent definition of auxiliary stratotype localities was being discussed by the Subcommission, with the view to presenting a series of standard criteria for the definition of 'Auxilliary Boundary Stratotypes – SABS'. A paper on this topic is awaiting publication in *Episodes*. Finally, he mentioned that a series of article on the various catagories of stratigraphical classification were in progress, and are being compiled for publication in *Newsletters in Stratigraphy* and a meeting on the topic is planned to be held in Hannover in October this year.
- (iii) Pre-Cryogenian. Nora Noffke (chair SPrCC) reported that work was proceeding on the definition of subdivisions for the Hadean and Archean, based on rock numerical ages, workshops and field meetings to be organised in South America and Australia. A proposal has been submitted and is now being revised.
- (iv) Cryogenian. Maoyan Zhu (chair SCrS) mentioned that the Subcommission had held two-day virtual conference via Zoom on 'Cryogenian glaciation: the extraordinary Port Askaig record' in May 2021. Cryogenian Webinar Series. This year a total of three webinars were presented on topics covering the Tonian/Cryogenian transition and Cryogenian records of the Tambien Group in Ethiopia and of the Flinders Ranges in South Australia. A twitter account @cryogenian has been established to promote the events of the Cryogenian/Tonian research community. Finally a white paper on division of the pre-Cryogenian time was published by the Geological Society, London. Candidate sections for the base of the Cryogenian are being examined.
- (v) Ediacaran. Marc Laflamme (chair SES) stated a field workshop to examine Ediacaran successions in Brazil and Argentina was postponed. A special issue of the *Journal of Paleontology* is being compiled to examine how useful fossils for the Ediacaran stratigraphy. Steps were being taken to determine what criteria will be useful for dividing the Ediacaran System first into series and then stages (particularly the second and terminal stages of the Ediacaran System). The goal is to finalise the discussion this year. A virtual conference dedicated to Ediacaran taxonomy is planned for October, and a special session of the Geological Society of Canada will be held in May 2022.
- (vi) Cambrian. Per Ahlberg (chair SCaS) stated that discussions were still in progress to define Stage 10 for which two candidate sections were being examined in 2021. The

- Subcommission continues to examine issues surrounding definition of the basal Cambrian GSSP. However, the result of serious, toxic arguments regarding definition matters by two individuals has led to the Subcommission being suspended in 2021 and dissolved in 2022. The advice of the IUGS is being sought on how to proceed, including identifying younger workers who could be invited to join the voting membership.
- (vii) Ordovician. Thomas Servais (chair SoS) noted that all the stages had defined stratotype localities, ratified between 1997-2006. He noted that the Subcommission was investigating the possibility dedicating the auxiliary stratotype for the Cambrian/Ordovician boundary at Dayangcha in China. A special volume entitled '*The Ordovician of the World*' will be compiled for publication by the Geological Society, London. A meeting is scheduled to be held this year in Marrakesh. A meeting on Ordovician Series is scheduled in 2023 in Estonia.
 - (viii) Silurian. Petr Štorch (chair SSS) noted that the principal work will be devoted to GSSP-related research activities – restudy of some previously ratified, but currently inadequate three basal stratotypes. Delayed formal proposals of the Aeronian and Telychian GSSP replacement candidates will be submitted in 2022. A Homerian working group will be established and restudy of the Homerian GSSP, together with further search for sections suitable for new GSSP of the Wenlock Series. Application of astronomically-tuned cyclostratigraphy integrated with radiometric data and high-resolution biostratigraphy. The SSS bi-annual field-meeting and business meeting planned in Sofia, Bulgaria for August 2021 in collaboration with Geological Institute of Bulgarian Academy of Sciences had to be postponed once more, this time possibly to be held in 2023. An on-line business meeting of the ISSS will be organised this year.
 - (ix) Devonian. José Ignacio (Nacho) Valenzuela Ríos (Vice-Chair SDS) reported that work on formal proposals or progress reports submitted for the revision of the basal Emsian Stage GSSP from several areas were being considered. Sites in Uzbekistan, Spain and the Czech Republic were under consideration. It is hoped to forward this proposal in 2-3 years' time. Revision of the Devonian/Carboniferous boundary was being examined in close collaboration with the Carboniferous Subcommission. A face-to-face business meeting is planned in November, to be held in Thailand at the International Paleontological Congress. In 2023 a field meeting in New York State is planned.
 - (x) Carboniferous. Xiangdong Wang (Chair SCbS) stated that a special volume entitled '*The Carboniferous Timescale*' was officially published in the Geological Society, London, Special Publications in 2021. As a consequence of the Covid-19 pandemic, many events have been deleted or postponed to new dates. In 2021, the SCbS executive committee planned to organise several online workshops about the progress of the Carboniferous studies around the world. Task group leaders for the establishments of four boundaries were re-appointed and related works were carried out to facilitate the definition of the bases of the Serpukhovian, Moscovian, Kasimovian and Gzhelian stages. Detailed proposals for the GSSP defining the base of the Moscovian and Gzhelian stages are being prepared and should be available in 2022.
 - (xi) Permian. Lucia Angiolini (chair SPS) noted that the Artinskian GSSP was ratified in 2022 and a dedication ceremony is planned for later this year. The Kungurian Stage GSSP candidate sections will be defined in the Ural Mountains. Revision of the Permian timescale needs to be improved (Guadalupian Stage, replacement GSSP section of the base-Lopingian). Robust palaeogeographical frameworks for the Permian and focus on

North-South, Gondwana correlations are planned. Proposed DDE-sponsored informatics support for biostratigraphical data management and palaeogeographical reconstructions is being organised with Shuzhong Shen's group in Nanjing University (see below). A paper on the Roadian Stage is nearing completion. A series of unpublished articles on the Middle Permian will be completed this year. Organisation of webinars to increase the size, diversity and international coverage of the Permian Community will be organised during the year.

- (xii) Triassic. Zhong-Qiang Chen (chair STS) stated that the voting membership of the Subcommission was aging and need new younger workers to join. Only three of the seven stage boundaries have currently been defined. The Carnian-Norian and Induan-Olenekian boundaries are currently being studied, the former being hotly debated. The Norian GSSP is anticipated to move towards a vote in late 2022, whilst the Olenekian GSSP proposal is expected to be submitted to STS for ratification in 2023. The Anisian GSSP is in preparation. A total of two international symposia, 2-3 STS sessions, 1-2 thematic issues, significant progress on 4 GSSPs (2 of them can be ratified) are hoped to be achieved. The first, the International Symposium on Triassic Integrated Stratigraphy and Bio-Environmental Events in Wuhan, China, has been cancelled. Two regional meetings are planned, one in France and the second in eastern Tibet. A summer school is also planned in Kyrgyzstan. The global Triassic book series: *Triassic of the World*, chapters will be compiled in 2022-2024. A long-time stasis in the Rhaetian GSSP working group has seen no significant prospects of change. If this continues into early 2022, a new chair of this working group will be sought to move forward at a faster pace. Pillar has offered share information on previous attempts to define this boundary.
- (xiii) Jurassic. Angela Coe (chair SJS) reported that the Kimmeridgian Stage GSSP was ratified in 2020. A dedication ceremony will be organised in due course. Three GSSPs are still to be defined for the Tithonian, Callovian and Oxfordian stages. These sequences require reassessment. Of these the Oxfordian is the most advanced, with three candidate sections, one in France, in England and in Russia. There is a need to facilitate communication on the Jurassic for both specialist and non-specialist audiences. including promoting the Jurassic GSSPs. This will be achieved through meetings, workshops, outreach activities and maintaining an up-to-date and informative subcommission website. The 11th Jurassic Congress will be held in Budapest, Hungary in September 2022. Joint investigations are underway with the Cretaceous Subcommission to help them to define the base of the Berriasian Stage and the Jurassic/Cretaceous boundary.
- (xiv) Cretaceous. Maria Rose Petrizzo (chair SCrS) The Coniacian Stage GSSP was ratified in 2021, for which a dedication ceremony is planned for August this year. Official ceremonies for the inauguration and placement of the golden spikes for the Albian and Hauterivian GSSPs are also planned for mid-2022. Finalisation of the GSSP proposals for the base Barremian and base Campanian are in hand. Three GSSP proposals for the base Valanginian, base Aptian and the base of the Berriasian Stage are in preparation. Preparations continue for the definition of substages for discussions at the forthcoming meeting: 11th International Symposium on the Cretaceous (Poland, 2022).
- (xv) Paleogene. Aitor Payros (Vice-chair SPaS) reported that the primary aim this year is to define the base of Bartonian Stage, choose a type section and submit a GSSP proposal to the voting membership. A site in Bottaccione was proposed by the working group to the SPaS but this was not adequate and they have been asked to resubmit it. A possible

alternative is a site in Spain for which a proposal expected this year. Revisiting existing GSSPs and, if necessary, define new GSSPs and/or ASSPs in order to characterise better the boundaries is planned. A project to produce computer-based three-dimensional models of existing GSSPs in Europe, the images to be uploaded to a website is being initiated. In August 2022 a meeting entitled: Paleogene climate and biotic events will be held in Bremen.

- (xvi) Neogene. Ken Miller (chair SNS) noted that during 2022 the subseries/subepoch were ratified for the Neogene. A field-based project (GELSTRAT) to expand the resolution of the Pliocene to Lower Pleistocene stages (in co-operation with the SQS) is underway to sink a borehole to obtain a continuous, well-preserved marine sequence in Sicily, following a joint meeting. This core could provide a resolution of ~20 ka through the interval. Work is also underway to define the base of the Middle Miocene Serravallian Stage at La Vedova in Sicily and the Burdigalian Stage possibly in ocean-floor (cored) deposits.
- (xvii) Quaternary. Liping Zhou (vice-chair SQS) also mentioned the on-going deep drilling noted above (Neogene, section xvi), termed the GELSTRAT project, the aim of which is to expand knowledge of the Pliocene to Lower Pleistocene in Sicily. This was initiated at a meeting beforehand in Italy. The other major task at present is focused on the 'Anthropocene' definition. A symposium to discuss the potential GSSPs for a chronostratigraphical 'Anthropocene' will be held in Italy under the auspices of the working group. It was noted that concern over a potential GSSP proposal was growing within the Quaternary community and beyond. DH asked whether the SQS had approved the definition of the 'Anthropocene' as a chronostratigraphical unit, and Phil Gibbard (PG) stated that it had not. DH said that it has to be approved by both the SQS, ICS and IUGS before a unit can be adopted. DH also made the point that the SQS should be focused on defining the remaining stage for the Upper Pleistocene, as their first priority but it was noted that this was progressing. The possibility of defining an additional Middle Pleistocene stage was mentioned.

4. Deep-time Digital Earth (DDE).

This large project is based at Nanjing University its aim being to create a substantial database of geological evidence. Although a founding member, ICS participation has been minimal to date. DH and SS asked if each subcommissions could nominate a contact person for their system to help assemble pdfs of papers containing high-quality stratigraphic data, including GSSPs, biological and non-biological range data.

5. Website and information developments.

Nic Carr (NC, webmaster) reported on the new developments on the website and related issues (see appendix). He noted that the website is up to date. Currently eight subcommissions sites had been transferred to the ICS family, with two in progress and six yet to be transferred. He said that the interactive timescale chart was still out of date but that he intended to integrate it into auto-update during the year. Finally, he said that the iPhone app was down and would have to be reworked.

Kim Cohen (KC, the graphics officer) stated that the International Stratigraphic Chart had just been updated with the latest available information. It continues to be in high demand. The existence of the change log was mentioned. He also mentioned the status and procedures of the chart translations, and how he deals with reproduction permissions.

6. ICS contributions to the IUGS 60th anniversary celebrations.

DH reminded the members that 2022 was the 60th anniversary of IUGS and that the Commission had been asked to flag up new, and potentially exciting events that could be used to promote ICS/IUGS activities. He also noted that the IUGS organisers had requested ICS to identify five geological sites that had a critical bearing on Earth history.

7. Location of STRATI 2023.

DH requested members to submit short (2 pages) proposals for a possible venue for the next STRATI meeting to be held in 2023.

There being no other business, the meeting was closed at 16.45.

Appendix

ICS Webmaster Report, Feb 2022. Nick Carr

- Website report
 - website is as up-to-date as content contributions allow it to be
 - the Guide has been updated
 - it remains free!
- Subcommission sites
 - transition to new system status
 - <https://github.com/i-c-stratigraphy/subcommission-template/projects/1>
 - 8 transitioned, 2 in progress, 6 not started
- Interactive chart
 - <https://stratigraphy.org/timescale/>
 - now out-of-date
 - intend to update in June, base it on Semantic data
 - iPhone app no longer available
 - will follow up with Fan
- Timescale KG
 - data basis for future website content
 - <https://github.com/i-c-stratigraphy/geologic-timescale-kg>
 - integrative model of time periods, GSSPs, literature references
 - Steve Richards (Arizona GS) still working on content
 - I'm working on competency questions (Requirements + queries) for the data

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<https://github.com/i-c-stratigraphy/geologic-timescale-kg/tree/master/resources/queries/requirements>

- I've identified we are missing stratigraphic relations
- ETA for data and queries, June
- No ETA for a display system yet!

- CGI informatics

- New production vocabulary server: <https://cgi.vocabs.ga.gov.au/>
- Chart very hard to use, hence above
- Will submit a simple hierarchy-only profile of KG to CGI
 - demo: <http://prez.surroundaustralia.com/vocab/skos-demo>
- some GSeS (BGS, GS South Australia, GS Qld) might move beyond vocabs to ref

spatial data

- 2x proposals made for 2022
- MYA as a Temporal Reference System used but not defined
 - OGC has a close match
 - <http://www.opengis.net/def/crs/OGC/0/ChronometricGeologicTime>
 - "Concrete temporal CRS of millions of years elapsed from the present,

positive backwards."

- submission to CGI will be made to get this to work with this candidate data:

""

```
<http://resource.geosciml.org/classifier/cgi/geologicage/ma>
```

```
  a time:TRS ;
```

```
  rdfs:seeAlso
```

```
    <https://doi.org/10.1351%2FPAC-REC-09-01-22> ,
```

```
    <https://en.wikipedia.org/wiki/Year#SI\_prefix\_multipliers> ;
```

```
  skos:definition "Temporal position expressed numerically scaled
```

```
    in millions of years increasing backwards from
```

```
    the present"@en ;
```

```
  skos:prefLabel "Millions of years ago"@en ;
```

```
  owl:sameAs
```

```
"http://www.opengis.net/def/crs/OGC/0/ChronometricGeologicTime"^^xsd:anyURI .
```

""

- ISO TC211 moving to publish Semantic Web vocabs

- will impact GeoSciML and other "geo" standards

- IGSN samples models linking to strat

- new GA Samples API to be in production by June
 - current (old) system: <http://pid.geoscience.gov.au/sample/>
- Knowledge Graph links from Samples metadata to Stratigraphic Units DB, thus timescale elements

- Stratigraphic and geo-reasoning experiment

- proposed with GA & GSQ for 2022

Secretary General ICS
27 February 2022