



# International Commission on Stratigraphy Subcommission on Quaternary Stratigraphy

ANNUAL REPORT 2018

## 1. TITLE OF CONSTITUENT BODY and NAME OF REPORTER

Subcommission on Quaternary Stratigraphy (SQS)  
Reporting Officer: Martin J. Head, Chair SQS

## 2. OVERALL OBJECTIVES, AND FIT WITHIN IUGS SCIENCE POLICY

1. Chronostratigraphic subdivision of the Quaternary System/Period facilitated by the intercalibration of biostratigraphies, construction of integrated zonations, and recognition of global datum points, allowing correlation worldwide and between terrestrial and marine sequences.
2. Definition of Series/Subseries/Stage and, where appropriate Substage, boundaries through the selection of recommended GSSPs.
3. Promoting SQS's activities within the wider Quaternary geoscience community through publications, symposia, and the SQS website, and creating opportunities to study and compare stratigraphic sections by means of field meetings.
4. The objectives satisfy the IUGS mandate of fostering international agreement on nomenclature and classification in stratigraphy; facilitating international co-operation in geological research; improving publication, dissemination, and use of geological information internationally; encouraging new relationships between and among disciplines of science that relate to Quaternary geology world-wide; attracting competent students and research workers to the discipline; and fostering an increased awareness among individual scientists world-wide of those related programs being undertaken.

## 3. ORGANISATION - interface with other international projects / groups

SQS works closely with the International Union for Quaternary Research (INQUA), which represents and serves the interests of Quaternarists worldwide. IUGS provides advice, and crucial in offering feedback on the stratigraphic needs of the wider Quaternary community. It does not provide financial support. Prof. Thijs van Kolfschoten is a Vice President of INQUA with special responsibility for liaising with the SQS on stratigraphic issues. He is also a voting member of SQS which facilitates direct and rapid communication between the two organizations.

### 3a. Nominated Officers for 2016-2020 period:

Chair: Professor Martin J. Head  
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#### 4. NATIONAL/REGIONAL/GLOBAL SUPPORT FROM SOURCES OTHER THAN IUGS

INQUA provides encouragement, feedback and advice on SQS activities. INQUA's Commission on Stratigraphy and Chronology provides modest support for research on candidate GSSPs through its grants program, so directly assisting the work of SQS.

#### 5. CHIEF ACCOMPLISHMENTS AND PRODUCTS

1. **Subdivision of the Holocene Series/Epoch** into the Greenlandian, Northgrippian, and Meghalayan stages and their respective subseries/subepochs, defined by an existing GSSP (the base of the Holocene) and two new GSSPs, was ratified by the IUGS EC on June 14, 2018. This set of proposals was published as follows:

Walker, M., Head, M.J., Berkelhammer, M., Björck, S., Cheng, H., Cwynar, L., Fisher, D., Gkinis, V., Long, A., Lowe, J., Newnham, R., Rasmussen, S., Weiss, H., 2018. Formal ratification of the subdivision of the Holocene Series/Epoch (Quaternary System/Period): two new Global Boundary Stratotype Sections and Points (GSSPs) and three new stages/subseries. *Episodes* p. 1–11 [Online]. <https://doi.org/10.18814/epiiugs/2018/018016>.

News of this subdivision has been reported widely in the international media, drawing significant attention to the important work of the ICS/ IUGS. The GSSP for the Meghalayan Stage is in a speleothem and as such is the first GSSP capable of being displayed in a museum without melting! It will be showcased at the 36<sup>th</sup> International Geological Congress in Delhi in 2020.

2. **Chiba section approved by SQS to serve as GSSP for the Chibanian Age/Stage and Middle Pleistocene Subseries/Subepoch.** The Chiba proposal passed scrutiny by high-level Japanese national committees. Voting within SQS concluded on 16 November, 2018. The proposal received the following votes: 19 in favour, 2 against, 1 abstain. Following a recent amendment to the ICS statutes whereby abstentions do not count towards the total used for determining percentages, the proposal was passed by the SQS voting membership with 90.5% and hence a clear supermajority. All 22 members of SQS returned their ballot forms: 20 in favour, 1 against; approved by a supermajority of 95%. The Chiba proposal will be submitted to

ICS for approval in 2019 after minor revision. If the Chiba section is ratified, it will be the first GSSP to be hosted by Japan. There is already substantial media interest in this prospect.

This follows SQS voting on November 8, 2018 on the following proposals: 1) formalize the Lower/Early Pleistocene Subseries/Subepoch comprising the Gelasian Stage/Age and the superjacent Calabrian Stage/Age, at the Monte San Nicola GSSP. 20 in favour, 1 against. Approved by a supermajority of 95%. 2) formalize the term Middle Pleistocene. 20 in favour, 1 against. Approved by a supermajority of 95%. 3) formalize the terms Upper/Late Pleistocene. 19 in favour, 2 against. Approved by a supermajority of 90.5%. These three proposals are therefore approved by supermajority and will be submitted to ICS before the end of the year.

**3. The Anthropocene Working Group** held an international workshop on October 6–8 at the Max Planck Institute for Chemistry in Mainz, Germany. It was well attended (42 participants, including Phil Gibbard as AWG member and Secretary General of ICS) and saw numerous presentations during the course of two days including two talks on prospective GSSP sites: one by An Zhiseng on a marine site in China, and another by Martin Head on the meromictic varved deposits of Crawford Lake, southern Ontario.

#### 6. SUMMARY OF EXPENDITURE IN 2018

Attendance by Colin Summerhayes (UK) at the Anthropocene Working Group international workshop in Mainz, Germany, on October 6–8, = CAN \$870.80. Attendance by Martin Head at the same workshop = CAN\$ 1735.35. Total expenses for 2018 = **CAN\$ 2606.15**.

#### 7. SUMMARY OF INCOME IN 2018

No income except ICS payment for 2018.

#### 8. BUDGET REQUESTED FROM ICS IN 2019

**Priority 1.** INQUA Congress (25–31 July, 2019), Dublin, Ireland. This is the premier meeting event for Quaternarists, and is held once every four years. Two SQS-sponsored sessions and SQS business meeting:

- i) Session: Formal chronostratigraphy in the Quaternary. Convener: M.J. Head
- ii) Session: The Last Interglacial and interglacial comparisons: local records and global signals. Conveners: M.J. Head and E. Wolff.
- iii) SQS business meeting: an open meeting reporting the work of SQS and inviting feedback.

Request is for CAN \$2000 to allow Martin Head as Chair of SQS to attend this congress. based on airfare (CAN\$ 1300), university accommodation (CAN\$ 128 x 5 = 640), congress registration (CAN\$ 747) = CAN\$ 2687.

**Priority 2.** STRATI 2019 (2–5 July, 2019). SQS-sponsored session:

- i) Quaternary stratigraphy and chronostratigraphy (Theme T3. Erathemes, Systems, Series, Stages), convened by M J. Head, J.A. Zalasiewicz, and C. Waters. M J. Head is also a member of the scientific committee of STRATI 2019. Request is for CAN\$2000 to allow Martin Head as Chair of SQS to attend this congress.

Request is for **CAN\$ 2000** to allow Martin Head as Chair of SQS and CAN\$ 1719 to allow Colin Waters as Secretary of the Anthropocene Working Group to attend this congress. This again is a modest request, based on:

M. J. Head's projected expenses:

Airfare (CAN\$ 1636), accommodation (CAN\$ 100 x 5 = 500), congress registration (CAN\$ 619) = CAN\$ 2755.

C. Waters' projected expenses:

Airfare (CAN\$ 600), accommodation (CAN\$ 100 x 5 = 500), congress registration (CAN\$ 619) = CAN\$ 1719.

Total request for SQS for 2019 is = **CAN\$ 5719**.

#### 9. WORK PLAN, CRITICAL MILESTONES, ANTICIPATED RESULTS AND COMMUNICATIONS TO BE ACHIEVED NEXT YEAR:

- Revise Chiba proposal for submission to ICS, with the ultimate purpose of seeing the Chibanian Stage and its Middle Pleistocene Subseries ratified by IUGS EC. Intrinsic to this will be a separate advance proposal to approve the Lower/Early Pleistocene Subseries as defined by the Monte san Nicola GSSP that already defines the base of the Quaternary System, Pleistocene Series, and Gelasian Stage; along with proposals to define the terms Middle and Upper/Late Pleistocene.
- Focus then on identifying a GSSP for the Upper/Late Pleistocene and its respective stage/age. This will in part require a reinvigoration of the Late Pleistocene Working Group under the new co-leadership of Martin Head. This objective ties closely with the INQUA Congress special session "The Last Interglacial and interglacial comparisons: local records and global signals" to be convened next summer by M.J. Head and E. Wolff.
- The Anthropocene Working Group is planning to hold a workshop in New Orleans, U.S.A., next summer (tentatively 7–8th November, 2019). This will be an opportunity to assess progress on potential GSSPs including the Crawford Lake varved record. This meeting is timed to coincide with "The Mississippi: an Anthropocene River Project", which takes place in New Orleans Nov 9–16.

The work of SQS is financed almost exclusively through research grants of individuals working on prospective GSSP sections. Such funding is obtained primarily from national and regional governmental research agencies, institutes, and universities. The Anthropocene Working Group has been particularly successful in obtaining funding owing to the high visibility of the Anthropocene. However, it is difficult to obtain funding for SQS conference travel and working group field trips, and ICS funding is accordingly critical to the activities of SQS.

## 10. KEY OBJECTIVES AND WORK PLAN FOR THE PERIOD 2016–2020

- Develop and submit GSSP proposal for definition of the Upper/ Late Pleistocene and its respective Stage/Age.
- Continue search for Anthropocene candidate GSSPs, encourage research on those already identified, hopefully for submission in 2020 or soon thereafter.
- Continue to explore the fine-scale subdivision of the Quaternary.

Respectfully submitted:  
Martin J. Head, Chair SQS  
St. Catharines, 20th November, 2018

## APPENDIX

### Names and Addresses of Current Officers and Voting Members of SQS

#### *Officers of SQS*

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#### *Other Voting Members of SQS*

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There has been no change in the SQS voting membership during the current reporting year.

## List Of Working (Task) Groups and their Officers

### *SQS Working Group on the “Anthropocene”*

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Secretary: Professor Colin Waters  
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Full membership of the Working Group: Tony Barnosky (USA), Alejandro Cearreta (Spain), Paul Crutzen (Germany), Matt Edgeworth (UK), Erle Ellis (USA), Mike Ellis (UK), Ian Fairchild (UK), Agnieszka Gałuszka (Poland), Philip Gibbard (UK), Jacques Grinevald (Switzerland), Peter Haff (USA), Irka Hajdas (Switzerland), Martin J. Head (Canada), Juliana Assunção Ivar do Sul (Brazil), Catherine Jeandel (France), Reinhold Leinfelder (Berlin), John McNeill (USA), Cath Neal (UK), Eric Odada (Kenya), Naomi Oreskes (USA), Clément Poirier (France), Dan Richter (USA), Will Steffen (Australia), Colin Summerhayes (UK), James Syvitski (USA), Davor Vidas (Norway), Michael Wagreich (Austria), Colin Waters (Secretary, UK), Mark Williams (UK), Scott Wing (USA), Alex Wolfe (Canada), Jan Zalasiewicz (Chair, UK), An Zhisheng (Xi'an) (China).

William Shotyk (Canada) and Neil Rose (UK) added in 2018; no resignations.

### *Working Group on the subdivision of the Holocene Series*

Convener: Professor M.J.C. Walker  
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### *Working Group on the Middle/Upper Pleistocene Subseries Boundary*

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No change in membership from 2016. In September 2018, it was decided that Martin Head would join the leadership as co-convener of the working group to help reinvigorate it after a long period of inactivity.

### *Working Group on the Lower/Middle Pleistocene Subseries Boundary*

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Co-convener: Professor Brad Pillans

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No changes to the membership in 2018. The group will be disbanded when the Middle Pleistocene GSSP is ratified.