



International Commission on Stratigraphy Subcommission on Quaternary Stratigraphy

ANNUAL REPORT 2014

1. TITLE OF CONSTITUENT BODY

Subcommission on Quaternary Stratigraphy (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.

3a. CHIEF ACCOMPLISHMENTS AND PRODUCTS IN 2014

1. First International Meeting of the SQS Anthropocene Working Group, Berlin, Germany, October 16–18, 2014. Made possible through kind support of the Haus der Kulturen der Welt. Seventeen members attended, and agreed that the Anthropocene should be formalized with an onset some time in the mid-20th century.
2. Following publication of a discussion paper in 2012 (Walker et al., 2012, *Journal of Quaternary Science*, 27, 649–659) by an SQS / INTIMATE Working Group exploring the formal subdivision of the Holocene, comments were solicited from the wider stratigraphic community during 2013–14. The Working Group is now moving towards the subdivision of the Holocene into named stages corresponding to the widespread but inconsistent informal usage of a tripartite division of the Holocene ('early', 'middle' and 'late'). Each stage is to be defined by a GSSP, the highest two with their timing now agreed at 8.2 ka BP and 4.2 ka BP.

3. Field excursion to the Middle–Upper Pleistocene Fronte section, Taranto, Italy, October 14, 2014. Arranged in conjunction with the SQS Middle–Upper Pleistocene Working Group, this trip allowed the detailed inspection of the marine Fronte section, a candidate GSSP for the Upper Pleistocene Subseries boundary, and numerous associated deposits. Ten participants including four from Japan. Facilitated with the generous assistance of the Italian Air Force, upon whose land the Fronte section is situated. Televised report: Studio 100 TV Italy (aired 14 Oct 2014).
4. Field Workshop on the Lower–Middle Pleistocene Transition in Italy. University of Bari Aldo Moro, Bari, Italy, October 11–13, 2014. A three-day international meeting co-sponsored by SQS involving a one-day symposium of invited talks in Bari, followed by two days spent visiting two candidate GSSP sections, Montalbano Jonico and the Valle di Manche, and the coeval lacustrine Sant’Arcangelo section. There were about 28 participants including five proponents of the third candidate Middle Pleistocene GSSP, the Chiba section in Japan. Televised report: RAI 3, the regional station of the main Italian National TV company (aired 12 Oct 2014).

3B LIST OF MAJOR PUBLICATIONS OF SUBCOMMISSION WORK (BOOKS, SPECIAL VOLUMES, KEY SCIENTIFIC PAPERS)

Waters, C. N., Zalasiewicz, J. A., Williams, M., Ellis, M. A. & Snelling, A. M. (eds) 2014. A Stratigraphical Basis for the Anthropocene. *Geological Society, London, Special Publications*, 395. Edited by members of the Anthropocene Working Group (AWG) and containing 17 papers of which many are authored or coauthored by members of the AWG. The first batch of papers was published online in 2013.

The new journal *Anthropocene Review*, published by SAGE, was launched in 2014 (<http://anr.sagepub.com>) with many of the editorial board, including the Editor-in-Chief, serving also on the AWG. AWG members have published in the journals *Anthropocene*, *Anthropocene Review*, *Nature Geoscience*, *Rendiconti Lincei*, *Continental Shelf Research*, *Science of the Total Environment*, and *Climate Law*.

Head, M.J., Gibbard, P.L., and van Kolfschoten, T. (eds.) in prep. “The Quaternary System/Period and its Formal Subdivision”. *Quaternary International*, special issue. A total of 15 papers to be included, and scheduled for publication in 2015.

3C. PROBLEMS ENCOUNTERED, IF APPROPRIATE

The Working Group on the Upper Pleistocene Subseries Boundary, after five years of inactivity, is now beginning to make progress, with the proposal of a new candidate GSSP, the Fronte section, in Taranto, Italy, and a field trip to this section (see above). Dr Alessandra Negri, a key proponent of the Fronte section, has joined the Working Group. But finding such a recent GSSP

(~130 ka) in marine deposits on land that do not display facies changes at the boundary presents special challenges. Therefore a search for additional candidate GSSPs is also underway.

4a. OBJECTIVES AND WORK PLAN FOR NEXT YEAR (2015)

1. The 19th INQUA (International Union for Quaternary Research) Congress, to be held in Nagoya, Japan, July 27–August 2, 2015, will be the premier event for Quaternarists in 2015. INQUA congresses are held every four years. M.J. Head (SQS chair) is to give a plenary keynote talk at the Congress on the work of the SQS. Three events are being sponsored by SQS: 1) a special symposium “The Early–Middle Pleistocene transition: local records, global correlations” co-convened by M.J. Head and others; 2) a Business Meeting of the SQS; and 3) a two-day trip to see the Chiba Section, a candidate GSSP for the Middle Pleistocene Subseries boundary. This is a sequel to the SQS-sponsored field workshop in Italy, October 2014, where the two other candidate GSSPs in Italy were examined. The overall intent is to consolidate understanding of the three Middle Pleistocene candidate GSSPs in advance of preparations to submit formal GSSP proposals, hopefully the following year.
2. SQS plans to co-sponsor the following special session “Neogene–Quaternary Integrated Stratigraphy: SQS-SNS-RCMNS joint session” at STRATI 2015 in Graz, Austria, in July, 2015. The co-conveners will include Fabrizio Lirer (for SQS) and Isabella Raffi.
3. Special issue of *Quaternary International*, editors: M.J. Head, P.L. Gibbard, and T. van Kolfschoten, to be finalized early in 2015. This is based on papers presented at “The Quaternary System/Period and its Formal Subdivision” during STRATI 2013.
4. Proponents of the three candidate GSSPs for the Middle Pleistocene Subseries boundary (two in Italy, one in Japan) will be asked late in 2015 to provide a timetable for submitting formal proposals to SQS, with the hope that a decision by SQS on this GSSP can be accomplished by 2016.
5. During 2015, the SQS / INTIMATE Working Group on the formal subdivision of the Holocene will be working towards submitting a formal proposal to subdivide the Holocene into three named stages defined by GSSP, with the two highest at 8.2 ka BP and 4.2 ka BP.

5. SUMMARY OF EXPENDITURES IN 2014 (Can \$)

	Payment	Deposit	Balance
Carried forward (November 28, 2013)			1693.38
Prof. S. Finney (ICS funds for 2014)		1855.00	3548.38
John Wiley & Sons sponsorship for 2013		431.10	3979.48
Prof. M.J. Head (attendance at Bari*)	2133.51		1845.97

Balance at November 7, 2014

1845.97

ICS–NSF Special Funding (2013) – reimbursement in progress:

Dr. Osamu Kazaoka (attendance at Bari*) allowance up to US\$2000.00

Prof. Makoto Okada (attendance at Bari*) allowance up to US\$2000.00

*= Field Workshop on Lower–Middle Pleistocene Transition in Italy, October 11th–13th, 2014, based at Bari University, Italy.

6. BUDGET REQUESTS AND ICS COMPONENT FOR 2015

Funds are requested to enable one proponent from each of the two Italian Middle Pleistocene candidate GSSPs (Montalbano Jonico and the Valle di Manche) to visit the Chiba candidate GSSP as part of the INQUA Congress in Japan, 2015, and to participate in the special symposium “The Early–Middle Pleistocene transition: local records, global correlations” co-convened by the Chair of SQS. This is a sequel to the Italian field workshop in 2014 where the Italian candidate GSSPs were visited and discussed. A total of \$2000 each is requested for one representative of each of the two Italian candidate GSSPs to attend the Congress. In addition, \$2000 is requested for the Chair of SQS to visit the Congress in order to examine the Chiba section, to convene the special symposium on the Early–Middle Pleistocene transition, and to chair a scheduled SQS Business Meeting. This GSSP is presently the main priority of SQS, and all three candidate sections are being researched with considerable energy and focus.

SQS is co-convening a joint session with SNS-RCMNS on “Neogene–Quaternary Integrated Stratigraphy” at STRATI 2015 in Graz, Austria, in July, 2015, and the co-convenor Dr. Fabrizio Lirer (a voting member of SQS) will represent SQS. \$800 is requested to support Fabrizio Lirer’s attendance at this important meeting.

In summary, a total of \$6800 is requested to assist the chair of SQS (Canada) and two members of the Italian working groups (both from Italy) in attending the INQUA Congress in Japan; and to assist a representative of SQS in attending STRATI 2015 in Graz.

7. CHIEF ACCOMPLISHMENTS OVER PAST FIVE YEARS (2010–2014)

1. Calabrian Stage/Age ratified in December 2011. Reference:
2. Cita, M.B., Gibbard, P.L., Head, M.J., and The Subcommittee on Quaternary Stratigraphy, 2012. Formal ratification of the base Calabrian Stage GSSP (Pleistocene Series, Quaternary System). *Episodes* 35(3): 388–397.
3. Strong progress towards defining named stages for the Holocene.
4. Strong progress on all three candidate GSSPs for the Middle Pleistocene.

8. OBJECTIVES AND WORK PLAN FOR NEXT 4 YEARS (2015–2018) – ranked according to priority.

1. Nominate GSSP for the Middle Pleistocene Stage/Subseries boundary.
2. Nominate two GSSPs to subdivide the Holocene Series into three named stages.
3. Explore further chronostratigraphic subdivision of the Quaternary System/Period, including the duration and status of the “Anthropocene”.
4. Nominate GSSP for the Upper Pleistocene Stage/Subseries boundary.

9. ORGANIZATION AND SUBCOMMISSION MEMBERSHIP

9a Names and Addresses of Current Officers and Voting Members

Officers of SQS

Chair: Professor Martin J. Head
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9B LIST OF WORKING (TASK) GROUPS AND THEIR OFFICERS

Working Group on the “Anthropocene”

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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), Alan Haywood (UK), Catherine Jeandel* (France), Reinhold Leinfelder (Berlin), John McNeill (USA), Cath Neal* (UK), Eric Odada (Kenya), Naomi Oreskes* (USA), Clement Poirier (France), Simon Price (UK), Andrew Revkin (USA), Dan Richter (USA), Mary Scholes (South Africa), Bruce Smith (USA), Victoria C. Smith* (Oxford), Will Steffen (Australia), Colin Summerhayes* (UK), James Syvitski* (USA), Davor Vidas (Norway), Michael Wagemann (Austria), Colin Waters (Secretary, UK), Mark Williams (UK), Scott Wing* (USA), Alex Wolfe (Canada), Jan Zalasiewicz (Chair, UK), An Zhisheng (Xi'an) (China). * = new member in 2014.

Working Group on the subdivision of the Holocene Series

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Working Group on the Middle/Upper Pleistocene Subseries Boundary

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Working Group on the Lower/Middle Pleistocene Subseries Boundary

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9C INTERFACES WITH OTHER INTERNATIONAL PROJECTS

The Subcommittee on Quaternary Stratigraphy (SQS) maintains close ties with The International Union for Quaternary Science (INQUA) through its Commission on Stratigraphy and Chronology (SACCOM). Prof. Phil Gibbard is both president of SACCOM and a voting member of SQS, and five other members of SACCOM are also members of SQS. This continues to lead to co-sponsorships of meetings/symposia by SQS and SACCOM.

Respectfully submitted:
Martin J. Head, Chair SQS
St. Catharines, 9th November, 2014