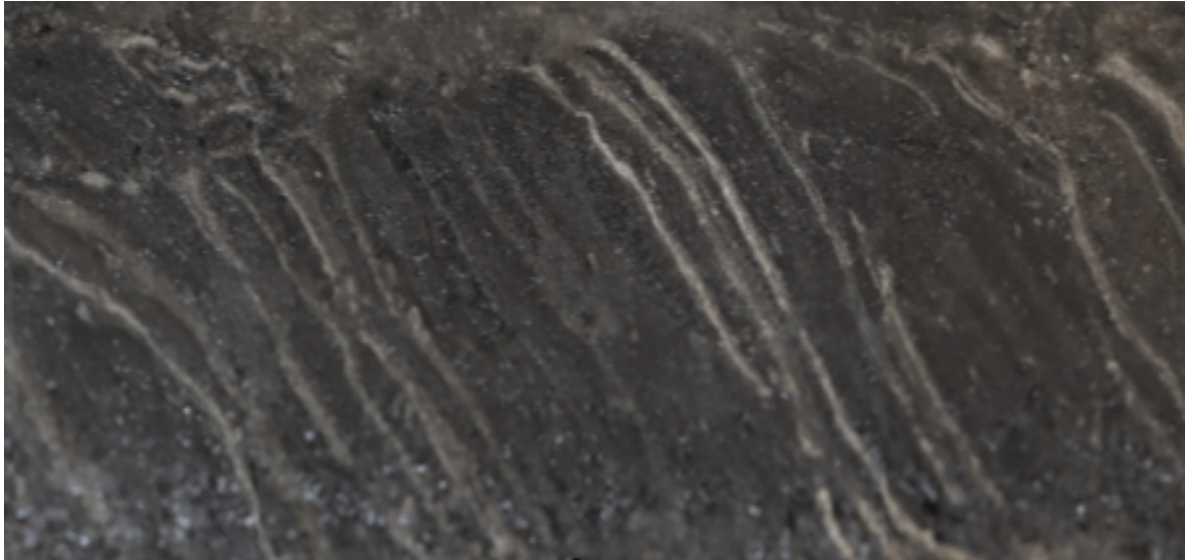


Newsletter of the Anthropocene Working Group



Anthropocene
Working Group

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AWG Newsletter 2023

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Chair's Column

This time last year, early 2023, the voting members of the AWG were actively working to complete the incredibly difficult task of selecting a GSSP to mark the base of the Anthropocene, a critical component of the attempt to seek formalization of the Anthropocene as a geological time unit. After three rounds of voting, core from Crawford Lake received supermajority support, as required by ICS statutes. Consequently, the AWG proposal was for an Anthropocene epoch/series and Crawfordian age/stage. Having resolved this task, voting members turned to selecting candidate Standard Auxiliary Boundary Stratotypes (SABSs). Newly introduced in 2023 by ICS as a requirement, we were fortunate that Martin Head was the lead author on the significance of, and procedures for, proposing SABSs and was able to guide us through selection of three candidate sites, Beppu Bay, Sihailongwan Lake and Śnieżka Peatland, with the remaining eight sites as reference sections. Following the binding vote on selection of Crawford Lake as the proposed site for the GSSP, a new core had been collected in order to carry out annual resolution analysis of the primary marker ($^{239+240}\text{Pu}$) and some secondary markers. This dataset providing exceptional resolution of the onset of the Pu bomb-spike and further binding votes were required to select the new core and propose the preferred precise position of the GSSP. There was very strong support to select the base of the organic lamina in the varve level equivalent to 1952 CE (predominantly deposited in the autumn), the varve in which the initial major increase in $^{239+240}\text{Pu}$ is recorded. Subsequently, it was formally agreed in a final vote that in addition to the GSSP, it was recommended that if required, a notional start of the Crawfordian age and Anthropocene epoch could be aligned with the detonation of the first thermonuclear device (the Ivy Mike detonation) which occurred on 1 November 1952 at 07:15 local time (19:15 on 31 October, GMT) and hence broadly coincident with the elevated Pu signal in the GSSP. Full details of all of the votes carried out from late 2022 to beginning of 2024 are recorded later in this Newsletter. I wish to acknowledge the great dedication of the voting members during such a demanding process to address these series of complex votes with the great consideration required given the magnitude of their decisions.

Armed with the results of the selection of Crawford Lake it was possible to announce the AWG decision at the 4th International Congress on Stratigraphy STRATI 2023 at Lille on the 11th July. In a session on "*The Anthropocene: stratigraphical concepts and evidence*" there were four presentations by: Colin Waters et al. on the stratigraphic enrichment of proxies during the Anthropocene; Francine McCarthy et al. on the Crawford Lake GSSP candidate; Michael Wagemann et al. on the urban Anthropocene of Karlsplatz, Vienna; and Colin Waters et al. on the understanding of 'event stratigraphy' in the context of the Anthropocene. Having agreed to requests from ICS not to announce the results of our voting to the media in advance of STRATI 2023, a joint online press conference with the Max Planck Society (MPS) was held independently of the congress on the evening of the 11th July as part of the MPS *Sustainable Anthropocene* conference, with presentations by Jürgen Renn (Director MPI for the History of Science and Founding Director MPI of Geoanthropology), Bernd Scherer (Former Director of Haus der Kulturen der Welt (HKW)), Katrin Klingan (Former Head of the Department Literature and Humanities, HKW), Colin Waters, Simon Turner, Francine McCarthy and Martin Head. It was an opportunity to celebrate the role of HKW in securing the funding that made the analysis of the 12 sites possible. Georg Schäfer is particularly thanked for his patience in coordinating the event given the very fluid nature of the plans.

Following the Congress, ICS President imposed without discussion a deadline to get the AWG submission completed by the 29th September 2023, which on complaint by AWG was extended to 31st October 2023. AWG members then worked tirelessly to ensure compilation of the report, which had to be written in parallel with continued rounds of voting and data analysis. Ultimately, the submission went to SQS at 23.45 pm on the 31st October, and comprised an executive summary, part 1 report (and appendices) detailing the evidence for the Anthropocene

as a candidate series/epoch and part 2 report on the GSSP and SABSS proposals (and appendices for the reference sections). It is our intention to make this complete submission available online in the near future, but at time of writing the Executive Summary is accessible at EarthArXiv at: <https://eartharxiv.github.io/moderation.html>. As has been the case throughout the life of the AWG, we value the importance of the evidence of our work being openly available to scrutiny.

As one now expects from AWG members, this Newsletter records the phenomenal output of publications and media outreach over the year. Plaudits to Francine for working tirelessly to promote the cause of Crawford Lake as the candidate GSSP and the amazing efforts of Team Crawford to further refine the data for the site. It is a worthy candidate. The compilation of the results of the analytical work of the 12 initial candidate sites, as published in a special thematic set of papers in *Anthropocene Review*, volume 10, provides a comprehensive assessment of the evidence for the Anthropocene across five continents and eight distinct environmental settings.

As we come towards the end of the life of the AWG (as a working group of the SQS at least), it is time to reflect on the early days of inception of the group in 2009. Only four members of the original group persisted through to the very end: An Zhisheng, Davor Vidas, Mark Williams and Jan Zalasiewicz. I would like to show my appreciation for their determination over the years. Mark did a wonderful job in being the original Secretary, helped coordinate the very influential 2011 Geological Society of London (GSL) meeting and has been a leading light in developing the group's biostratigraphical analysis and formidable presenter at conferences. But, without Jan none of this would have happened. He led that first tentative exploration of the Anthropocene by the GSL Stratigraphy Commission that ultimately inspired the inception of the group and during his time as Chair (from 2009 to 2020), and his phenomenal output of publications at the forefront of investigations into the concept have truly shaped how we view our impact upon the planet.

At the time of writing it would appear that our worthy submission to SQS was rejected, though we only found out via a leak in the New York Times and the SQS vote moderators have still not contacted us with the results or provided explanation of the basis by which it was rejected. This is an unacceptable way for the AWG members, who had worked for 15 years on behalf of SQS, to be treated. A catalogue of complaints about unethical behaviour by those in high-office over the past decade who have aimed at preventing fair assessment of any proposal had been compiled and submitted to an independent IUGS Geoethics Commission at the beginning of this year before voting commenced. Their reasonable assessment of a suitable schedule for ensuring a fair vote was largely ignored by IUGS in the haste of seeing the vote completed, aided by ICS clearly breaching their own statutes and rules. The full story will eventually be told, but is not for here and now. Certainly, the media have been greatly interested in understanding how SQS could possibly have come to their conclusion. The number of interviews by AWG members over the last few weeks are not included in the list provided later in this Newsletter.

Finally, it is with great sadness that we have lost another of the great influencers within the AWG with the passing of Peter Haff on 3rd February, almost exactly one year on from the loss of Will Steffen. Despite not being an active contributor to the stratigraphic decision-making process of selecting a GSSP, he was very much an important influence on the development of the thinking of the group with his challenging concept of an evolving technosphere and his ability to assess issues through a somewhat different, but always perceptive, perspective was always valued. The following obituary expresses the sadness in losing our colleague and supportive contributor to our group's activities.

Colin Waters
Chair, Anthropocene Working Group
16th March 2024

In celebration of Peter Haff – scholar, mentor, and friend



Peter K. Haff, a distinguished professor emeritus of the geosciences at Duke University and long-serving member of the Anthropocene Working Group, passed away on 3 February 2024 in Chapel Hill, North Carolina USA.

Born in Boulder, Colorado, and graduating from high school as valedictorian in Alexandria, Virginia, Haff received his BA from Harvard in 1966 and his PhD from the University of Virginia in 1970, both in Physics. For nearly 15 years, Haff worked as a Caltech scientist, exploring particle physics, specifically of granular flows and “particle sputtering”, i.e., the ejection of small particles from the surface of solids following the impact of energetic particles of a plasma or gas. Haff produced a remarkable body of work on particle sputtering on the surface of the Moon and Jupiter’s Io, the erosion of atmospheres surrounding Mars and Ganymede, and even with Saturn’s spectacular E ring (a problem Haff like to call “the enigmae of Enceladus”). During this period, Haff became captivated by the Mojave and Death Valley; deserts would become one of his most enduring interests.

Moving with his family Suzanne, Tonya, and Jesse to Duke in 1988, Haff held joint appointments in the Pratt School of Engineering and the Nicholas School of the Environment. His leadership was marked by his tenure as Chair of the Earth and Ocean Sciences Division from 2001 to 2007. Haff was elected in 2016 as a fellow of the American Geophysical Union, a testament to his positive impact on his field and his peers. Election as an AGU Fellow is an honor reserved for individuals who have made exceptional scientific contributions.

It can be said that Haff grew to advocate a principle of scientific trespass, a principle first proposed by geologist G.K. Gilbert and one that requires not only enormous intellectual ability but also courage. According to Haff’s close friend, David Furbish of Vanderbilt, “Peter was intellectually fearless. In pursuing his work, nothing was *a priori* off the table.” Another

colleague and former Duke dean, William Schlesinger, credits Haff's pioneering work in geomorphology, particularly in our understanding of wind-blown movement of sand grains and the formation and dynamics of sand dunes. Haff's special mix of humor and modesty comes alive in a story from Furbish who once heaped praise on Haff for his mathematical formulation of what continues to be widely cited in physics as Haff's Cooling Law. Peter replied, no doubt in his own reserved manner, "Well.... it's not like it's one of Newton's laws; it's more like a Darcy's law or a Fick's law, after all. At most it's a physics law-let."

While Haff's early career was marked by investigations of natural phenomena, his incessant intellectual curiosity led him to explore the interactions of human activities with Earth systems writ large. Haff embraced the concept of the Anthropocene Epoch, and is credited with originating the concept of the Earth system's newest sphere, the technosphere, that he considered to overlap with Earth's biosphere, hydrosphere, lithosphere, pedosphere, and atmosphere. As a member of the AWG, Haff produced a number of papers exploring how the technosphere has assumed its own agency, a major departure from conventional ways of conceiving of agency centered in human beings.

In Haff's near decade of retirement, he continued to come to Duke's campus to write, share a coffee or lunch, give away books, and to interact with colleagues and students. Haff was an active participant in Bruno Latour's three-day field and campus visit to Duke in 2015 and in Duke's scholarly celebration of Alexander von Humboldt's 250th birthday anniversary in 2019 and 2020. Haff deeply appreciated von Humboldt's descriptions of the joy and delight that is liberated when solving scientific problems.

In some circles, Haff will be remembered by a verb that was coined in his honor. "To Peterhaff it" means to approximate the solution to a quantitative problem to within the correct order of magnitude. "How many bricks are on the new Pratt Engineering Building?", Peter once asked. Haff was concerned about overparameterization of models and about teaching students only high-level mathematics. How special and ironic that the physicist who gave us a Cooling Law, thought it so important to help students estimate solutions to problems to within a factor of ten, to Peterhaff it!

Duke flags on campus were lowered February 14 in Haff's honor.

Dan Richter, Durham, NC

Voting record from late 2022 to early 2024

2022 binding vote on selection of rank for proposed Anthropocene chronostratigraphic unit

No. of potential voting members: 23
No. required to be quorate (60%): 14
No. of votes received: 23 (100% of voting membership).

Round 1 (concluded 17th December 2022): Epoch/series and corresponding stage: 22 votes (95.7%)
Stage alone: 1 vote (4.3%)
Other rank: 0 votes
Abstentions: 0

2022/2023 binding vote on selection of GSSP candidate

No. of potential voting members: 23
No. required to be quorate (60%): 14
No. of votes received: 23 (100% of voting membership).

Round 1 (concluded 17th December 2022): Crawford Lake: 11 votes (47.8%)
Sihailongwan Lake: 5 votes (21.7%)
Beppu Bay: 4 votes (17.4%)
Searsville Lake: 3 votes (13.0%)
All other sites :0
Abstentions: 0

Round 2 (concluded 20th February 2023): Crawford Lake: 11 votes (47.8%)
Sihailongwan Lake: 8 votes (34.8%)
Beppu Bay: 3 votes (13.0%)
Abstentions: 1 (4.3%)

Round 3 (concluded 19th April 2023): Crawford Lake 14 votes (60.9%)
Sihailongwan Lake 7 votes (30.4%)
Abstentions 2 (8.7%)

Hence, the proposal is for an Anthropocene epoch/series and Crawfordian age/stage.

2023 binding vote on selection of candidate Standard Auxiliary Boundary Stratotypes (SABSs)

No. of potential voting members: 22
No. required to be quorate (60%): 13
No. of votes received: 21 (95% of voting membership).

Peer-review of the published data for the 12 candidate sites determined three sites should be considered reference sections: Ernesto Cave (Italy), Karlsplatz (Vienna) and San Francisco Estuary (USA). A non-binding vote was undertaken (completed on 4th July 2023) with 19 members voting, to determine relative support for remaining sites. The candidates with least support, East Gotland Basin (Baltic Sea), Flinders Reef (Australia) and Palmer ice core (Antarctica) were excluded from the SABSs vote and were considered to represent reference sections. The remaining five sites then were included in a formal vote.

Round 1 (concluded on 6th August 2023) Beppu Bay, Japan 20 votes (95.2%)
 Sihailongwan Lake, China 19 votes (90.5%)
 Śnieżka Peatland, Poland 16 votes (76.2%)
 Searsville Lake, USA 12 votes (57.1%)
 West Flower Garden Bank, USA 9 votes 42.9%)
 No vote 1
 Abstentions 0

Hence, Beppu Bay, Sihailongwan Lake and Śnieżka Peatland all achieved greater than 60% support to be proposed as SABSs for the GSSP. Searsville Lake and West Flower Garden Bank Reef are included as reference sites.

2023 binding vote on the level (year) of the GSSP in the Crawford Lake core

No. of potential voting members: 22
 No. required to be quorate (60%): 13
 No. of votes received: 22 (100% of voting membership).

Following the binding vote on selection of Crawford Lake as the proposed site for the GSSP, a new core had been collected in order to carry out annual resolution analysis of the primary marker (²³⁹⁺²⁴⁰Pu) and some secondary markers. Given that the Crawford Lake submission voted on by AWG members was on an earlier core and proposing 1950 CE as the level of the GSSP in that core (as outlined by McCarthy *et al.*, 2023), it was necessary to confirm this in a binding vote. The results of the vote were concluded on 18th October 2023.

Q1. Can the preferred core from Crawford Lake be revised from CRA22-1FRA-3, as published in the original proposal McCarthy et al. (2023) in the Anthropocene Review Special Publication and selected by vote by the AWG, to the new core CRA23-BC-1F-A with annual-resolution Pu data?

Yes, 21 votes (95%)
 No, 0 votes (0%)
 Abstentions, 1 (5%)

Q2. What is your preferred level for the proposed Global boundary Stratotype Section and Point (GSSP) in the Crawford Lake core?

1950 CE¹, 4 votes (18%)
 1952 CE², 18 votes (82%)

¹ Specifically, at the base of the calcite lamina in the varve level equivalent to 1950 CE, fixed at a convenient date close to a lithological boundary evident in the core and consistent with the common understanding of the onset of the Great Acceleration. For practical purposes to be taken as 1st January 1950 CE.

² Specifically to be taken at the base of the organic lamina in the varve level equivalent to 1952 CE, the varve in which the initial major increase in ²³⁹⁺²⁴⁰Pu is recorded. For practical purposes to be taken midpoint between the two adjacent annual samples that show the biggest proportional increase within the run of samples that all have detectable Pu. At Crawford Lake this definition coincides in core CRA23-BC-1F-A with the Fall (October-December) 1952 CE closely coincident with the first thermonuclear detonation on 1st November 1952 CE. This option is conditional on selected 'YES' for question 1.

Hence, the Crawford Lake core CRA23-BC-1F-A has been selected as the host for the proposed GSSP, which is specifically taken in this core at the initial major increase in ²³⁹⁺²⁴⁰Pu coincident with the boundary between the lower calcite and upper organic component of the varve level equivalent to 1952 CE at a depth of 16.2 cm.

2023/2024 binding vote on nominal start time for the Anthropocene epoch/Crawfordian age

No. of potential voting members: 22

No. required to be quorate (60%): 13

No. of votes received: 22 (100% of voting membership).

Q1. Can the preferred core from Crawford Lake be revised from CRA23-BC-1F-A (for which all material had been consumed during analysis) to the alternative CRA23-BC-1F-B which contributed Pu data to the annual analysis and for which intact core is preserved, as published in McCarthy et al. (submitted) in the Anthropocene Review? The boundary will continue to be taken at the base of the organic lamina in the varve level equivalent to 1952 CE, the varve in which the initial major increase in ²³⁹⁺²⁴⁰Pu is recorded.

Yes, 21 votes (95%)

No, 0 votes (0%)

Abstentions, 1 (5%)

Q2. Can a notional start of the proposed Crawfordian age/Anthropocene epoch be proposed at a specific date and time. Options are: a) 00.00 GMT 1 January 1952; b) 1st November 1952 coincident with detonation of first thermonuclear device, augmenting the proposed Global boundary Stratotype Section and Point (GSSP) in the Crawford Lake core present at the boundary between summer and fall 1952 CE varves? The Ivy Mike detonation occurred on 1 November 1952 at 07:15 local time (19:15 on 31 October, GMT); or c) 00.00 GMT 1 January 1953. Please select only one option.

a) 1st January 1952, 1 vote (5%)

b) 1st November 1952, 19 votes (86%)

c) 1st January 1953, 1 vote (5%)

d) Abstentions, 1 (5%)

MULTI-AUTHOR AWG PUBLICATIONS (2023)

Head, M.J., Waters, C.N., Zalasiewicz, J.A., Barnosky, A.D., Turner, S.D., Cearreta, A., Leinfelder, R., McCarthy, F.M.G., Richter, D. de B., Rose, N.L., Saito, Y., Vidas, D., Wagnreich, M., Han, Y., Summerhayes, C.P., Williams, M., & Zinke, J. (2023). The Anthropocene as an epoch is distinct from all other concepts known by this term: a reply to Swindles et al. (2023). *Journal of Quaternary Science*, 38, 455–458. <https://doi.org/10.1002/jqs.3513>

Head, M.J., Zalasiewicz, J.A., Waters, C.N., Turner, S.D., Williams, M., Barnosky, A.D., Steffen, W., Wagnreich, M., Haff, P.K., Syvitski, J., Leinfelder, R., McCarthy, F.M.G., Rose, N.L., Wing, S.L., An, Z., Cearreta, A., Cundy, A.B., Fairchild, I.J., Han, Y., Sul, J.A.I. do, Jeandel, C., McNeill, J.R., & Summerhayes, C.P. (2023). The Anthropocene is a prospective epoch/series, not a geological event. *Episodes*, 46, 229–238. <https://doi.org/10.18814/epiiugs/2022/022025>

Waters, C.N., Head, M.J., Zalasiewicz, J., McCarthy, F.M.G., Wing, S.L., Haff, P.K., Williams, M., Barnosky, A.D., Fiałkiewicz-Kozieł, B., Leinfelder, R., McNeill, J.R., Rose, N.L., Steffen, W., Summerhayes, C.P., Wagnreich, M., An, Z., Cearreta, A., Cundy, A.B., Fairchild, I.J., Gałuszka, A., Hajdas, I., Han, Y., Ivar do Sul, J.A., Jeandel, C., Syvitski, J., Turner, S.D., & Zinke, J. (2023). Response to Merritts et al. (2023): The Anthropocene is complex. Defining it is not. *Earth-Science Reviews*, 238, 104335. <https://doi.org/10.1016/j.earscirev.2023.104335>

Zalasiewicz, J., Head, M.J., Waters, C.N., Turner, S.D., Haff, P.K., Summerhayes, C., Williams, M., Cearreta, A., Wagnreich, M., Fairchild, I., Rose, N.L., Saito, Y., Leinfelder, R., Fiałkiewicz-Kozieł, B., An, Z., Syvitski, J., Gałuszka, A., McCarthy, F.M.G., Ivar do Sul, J., Barnosky, A., Cundy, A.B., McNeill, J.R., & Zinke, J. (2023). The Anthropocene within the Geological Time Scale: a response to fundamental questions. *Episodes*, online. <https://doi.org/10.18814/epiiugs/2023/023025>

The Anthropocene Review Special Publication (2023) “Candidate sites and other reference sections for the Global boundary Stratotype Section and Point of the Anthropocene series”

Introduction

Waters, C.N., Turner, S.D., Zalasiewicz, J., Head, M.J., 2023. Candidate sites and other reference sections for the Global boundary Stratotype Section and Point of the Anthropocene series. *The Anthropocene Review*, 10, 3–24. <https://doi.org/10.1177/20530196221136422>

List of papers in order of lead author

Borsato, A., Fairchild, I.J., Frisia, S., Wynn, P.M., Fohlmeister, J., 2023. The Ernesto Cave, northern Italy, as a candidate auxiliary reference section for the definition of the Anthropocene series. *The Anthropocene Review*, 10, 269–287. <https://doi.org/10.1177/20530196221144094>

DeLong, K.L., Palmer, K., Wagner, A.J., Weerabaddana, M.M., Slowey, N., Herrmann, A.D., Duprey, N., Martínez-García, A., Jung, J., Hajdas, I. et al., 2023. The Flower Garden Banks *Siderastrea* siderea coral as a candidate Global boundary Stratotype Section and Point for the Anthropocene series. *The Anthropocene Review*, 10, 225–250. <https://doi.org/10.1177/20530196221147616>

Fiałkiewicz-Kozieł, B., Łokas, E., Smieja-Król, B., Turner, S., De Vleeschouwer, F., Woszczyk, M., Marcisz, K., Gałka, M., Lamentowicz, M., Kołaczek, P. et al., 2022. The Śnieżka peatland as a candidate Global boundary Stratotype Section and Point for the Anthropocene series. *The Anthropocene Review*, 10, 288–315. <https://doi.org/10.1177/20530196221136425>

Han, Y., Zhisheng, A., Lei, D., Zhou, W., Zhang, L., Zhao, X., Yan, D., Arimoto, R., Rose, N.L., Roberts, S.L. et al., 2023. The Sihailongwan Maar Lake, northeastern China as a candidate Global boundary Stratotype Section and Point for the Anthropocene series. *The Anthropocene Review*, 10, 177–200. <https://doi.org/10.1177/20530196231167019>

Himson, S., Williams, M., Zalasiewicz, J., Waters, C.N., McGann, M., England, R., Jaffe, B.E., Boom, A., Holmes, R., Sampson, S. et al., 2023. The San Francisco Estuary, USA as a reference section for the Anthropocene series. *The Anthropocene Review*, 10, 87–115. <https://doi.org/10.1177/20530196221147607>

Kaiser, J., Abel, S., Arz, H.W., Cundy, A.B., Dellwig, O., Gaca, P., Gerdts, G., Hajdas, I., Labrenz, M., Milton, J.A. et al., 2022. The East Gotland Basin (Baltic Sea) as a candidate Global boundary Stratotype Section and Point for the Anthropocene series. *The Anthropocene Review*, 10, 25–48. <https://doi.org/10.1177/20530196221132709>

Kuwae, M., Finney, B.P., Shi, Z., Sakaguchi, A., Tsugeki, N., Omori, T., Agusa, T., Suzuki, Y., Yokoyama, Y., Hinata, H. et al., 2022. Beppu Bay, Japan, as a candidate Global boundary Stratotype Section and Point for the Anthropocene series. *The Anthropocene Review*, 10, 49–86. <https://doi.org/10.1177/20530196221135077>

Stegner, M.A., Hadly, E.A., Barnosky, A.D., La Selle, S., Sherrod, B., Anderson, R.S., Redondo, S.A., Viteri, M.C., Weaver, K.L., Cundy, A.B. et al., 2023. The Searsville Lake Site (California, USA) as a candidate Global boundary Stratotype Section and Point for the Anthropocene series. *The Anthropocene Review*, 10, 116–145. <https://doi.org/10.1177/20530196221144098>

McCarthy, F.M.G., Patterson, R.T., Head, M.J., Riddick, N.L., Cumming, B.F., Hamilton, P.B., Pisaric, M.F.J., Gushulak, A.C., Leavitt, P.R., Lafond, K.M. et al., 2023. The varved succession of Crawford Lake, Milton, Ontario, Canada as a candidate Global boundary Stratotype Section and Point for the Anthropocene series. *The Anthropocene Review*, 10, 146–176. <https://doi.org/10.1177/20530196221149281>

Rosol, C., Schäfer, G.N., Turner, S.D., Waters, C.N., Head, M.J., Zalasiewicz, J., Rossée, C., Renn, J., Klingan, K., Scherer, B.M., 2023. Evidence and experiment: Curating contexts of Anthropocene geology. *The Anthropocene Review*, 10, 330–339. <https://doi.org/10.1177/20530196231165621>

Thomas, E.R., Vladimirova, D.O., Tetzner, D.R., Emanuelsson, D.B., Humby, J., Turner, S.D., Rose, N.L., Roberts, S.L., Gaca, P., Cundy, A.B., 2023. The Palmer ice core as a candidate Global boundary Stratotype Section and Point for the Anthropocene series. *The Anthropocene Review*, 10, 251–268. <https://doi.org/10.1177/20530196231155191>

Wagreich, M., Meszar, M., Lappé, K., Wolf, J., Mosser, M., Hornek, K., Koukal, V., Litschauer, C., Piperakis, N., Hain, K., 2022. The urban sediments of Karlsplatz, Vienna (Austria) as a reference section for the Anthropocene series. *The Anthropocene Review*, 10, 316–329. <https://doi.org/10.1177/20530196221136427>

Zinke, J., Cantin, N.E., DeLong, K.L., Palmer, K., Boom, A., Hajdas, I., Duprey, N., Martínez-García, A., Rose, N.L., Roberts, S.L. et al., 2023. North Flinders Reef (Coral Sea, Australia) Porites sp. corals as a candidate Global boundary Stratotype Section and Point for the Anthropocene series. *The Anthropocene Review*, 10, 201–224. <https://doi.org/10.1177/20530196221142963>

Anthropocene-related papers/books published by AWG members or in press (alphabetically by AWG author):

Alejandro Cearreta

Cearreta, A. (2023). Antropoceno geológico. *Trépanos* (online), 13. <https://trepanos.es/2023/04/26/antropoceno-geologico/>

Cearreta, A. (2023). Sea Level Change. In: N. Wallenhorst & C. Wulf (eds.), *Handbook of the Anthropocene, Humans between Heritage and Future*, 177–181. Springer Nature, ISBN: 978-3-031-25909-8, https://doi.org/10.1007/978-3-031-25910-4_28

Gardoki, J.; Cearreta, A.; Irabien, M.J.; Gómez-Arozamena, J.; Villasante-Marcos, V.; García-Artola, A.; Galaz-Samaniego, C.; Peñalba, C. & Bessa, F. (2023). Modern conditions and recent environmental evolution of the industrialized inner Ría of Ferrol (Galicia, NW Spain). *Continental Shelf Research*, 267, 105098. <https://doi.org/10.1016/j.csr.2023.105098>

Reinhold Leinfelder

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Francine McCarthy

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Colin Waters

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Mark Williams

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Jens Zinke (and Neil Rose)

Roberts, L.R., Kersting, D.K., Zinke, J. & Rose, N.L. (in press). First recorded presence of fly-ash particles in coral skeletons. *Science of the Total Environment*. <https://doi.org/10.1016/j.scitotenv.2024.170665>

REPORTS BY OTHER INTERNATIONAL BODIES

The IPCC Sixth Assessment Report (AR6) Synthesis Report released on 20th March 2023.
<https://www.ipcc.ch/ar6-syr/>

The OECD is making Anthropocene the framing for the Pisa 2025 multinational school test. This must be considered a massive breakthrough and mainstreaming of the concept.

<https://pisa-framework.oecd.org/science-2025/>

The PISA 2025 assessment measures how well countries are preparing their students with an understanding of science and how science produces reliable knowledge. This is crucial for citizens who need to make informed personal decisions about science-related phenomena such as health and the environment to engage in action within their families, local communities, and wider societies. It is particularly important in the 21st century when humanity faces an uncertain future as it enters the Anthropocene, an era in which human impact is significantly changing Earth's systems. A knowledge of science then matters at the individual, regional and global levels as we seek to address these impacts. The environmental science competencies to be measured in PISA 2025 relate to the environmental-related outcomes of students' science education, defined as 'Agency in the Anthropocene'

(Source: Sverker Sörlin, Umeå University).

CONFERENCES/LECTURES

Presentations by AWG members over 2023, (alphabetically by AWG author):

Alejandro Cearreta

Date	Conference/Meeting Title	Organisation/Venue
09.02. 2023	Invited Conference “Antropoceno geológico: No sólo clima y biodiversidad”	Ateneo Guipuzcoano, Donostia-San Sebastián, Spain
23- 28.04. 2023	Li, T.; García-Artola, A.; Walker, J.; Cearreta, A. & Horton, B., The importance of underestimated local vertical land motion component in sea-level projections: A case study from the Oka estuary, northern Spain	European Geosciences Union General Assembly 2023, Vienna, Austria
05.06. 2023	Invited Conference “Cambio Climático: La trayectoria del Antropoceno y (un poco) más allá”	Basque Environment and Ocean Week 2023, Bilbao, Spain
15.06. 2023	Invited Conference “Antropoceno: Geosfera+Tecnosfera”	5th Summer Course Guggenheim Bilbao Museoa: Modelos artísticos para el sistema Tierra, Bilbao, Spain
26- 30.06. 2023	Gardoki, J.; García-Artola, A.; Cearreta, A.; Irabien, M.J.; Gómez-Arozamena, J.; Villasante-Marcos, V.; Galaz-Samaniego, C. & Bessa, F., Modern environmental conditions on an agriculture-impacted estuary (Mondego, N Portugal): a foraminiferal approach	FORAMS 2023 International Symposium on Foraminifera, Perugia, Italy
11- 20.07. 2023	Li, T.; García-Artola, A.; Walker, J.; Cearreta, A. & Horton, B., Using paleo sea-level data and GIA models to reveal vertical land motion signal: Implications for local sea-level projections	28th International Union of Geodesy and Geophysics General Assembly (IUGG2023), Berlin, Germany
14- 20.07. 2023	Li, T.; García-Artola, A.; Walker, J.; Cearreta, A. & Horton, B., Underestimated vertical land motion component in sea-level projection – a case study from the Oka estuary, northern Spain	XXI INQUA Congress. Time for Change, Roma, Italy
16- 20.07. 2023	Gardoqui, J.; Cearreta, A.; Irabien, M.J.; Gómez-Arozamena, J. & Villasante-Marcos, V.; García-Artola, A.; Galaz-Samaniego, C.; Peñalba, C. & Bessa, F., Anthropogenic impacts on intertidal sediments from the inner Ría of Ferrol: Current and historical perspectives	XI Congresso Nacional de Geologia. Geociências e Desafios Globais, Coimbra, Portugal.

Date	Conference/Meeting Title	Organisation/Venue
17-22.09.2023	Sáez-Muñoz, M.; Gómez-Arozamena, J.; Cearreta, A.; Ortiz, J. & Martorell, S., Anthropocene dating by radionuclide analysis of estuarine sediments from northern Spain	ENVIRA 2023-7th International Conference on Environmental Radioactivity, Sevilla, Spain
20.10.2023	Invited Conference “¿Por qué vivimos en el Antropoceno?”	Official Opening ceremony of the 2023-24 Academic Course at the Miguel de Unamuno Residence Hall of the UPV/EHU, Bilbao, Spain
11-15.12.2023	García-Artola, A.; Li, T.; Shaw, T.A.; Peng, D.; Walker, J.S.; Cearreta, A. & Horton, B., Vertical land motion component is underestimated in sea-level projections from northern Spain	American Geophysical Union AGU 2023, San Francisco (USA)

Ian Fairchild

Date	Conference/Meeting Title	Organisation/Venue
Jan 2023	“Defining the Anthropocene”	Malvern U3A, UK
April 2023	Sedgwick Club Symposium: “The Anthropocene and the Underworld”	Earth Sciences, University of Cambridge

Reinhold Leinfelder

Date	Conference/Meeting Title	Organisation/Venue
14.03.2023	Leinfelder, R. Ernährung im Anthropozän - Essen wir die Erde auf. Online Lecture Series, The Anthropocene, https://anthropocene.univie.ac.at/fileadmin/user_upload/p_anthropocene/Events/RV2023_Anthropocene_Abstacts.pdf p.8-11, Video-recording: https://vimeo.com/809059157/	Department of Geology & Vienna Anthropocene Network, 1. European Climate and Environmental Education Centre/Hohe Tauern National Park (Carinthia) & Forum Anthropocene).
April – June 2023	Leinfelder, R., Lebenswelten der Kinder. Lecture course for the educational goal: Anthropocene: Human-nature-culture relationship as a task for the future	University College of Teacher Education Lower Austria, see https://www.ph-noe.ac.at/de/curriculum/studienjahre/leinfelder-jahr
16-20.07.2023	Leinfelder, R., The Anthropocene – from Earth System Analysis and Sedimentology to Futures Literacy (Invited Keynote-Talk)	XI Congresso Nacional de Geologia, Universidade de Coimbra, Portugal, XI CNG 2023 – Livro de Resumos, p. 7 (or https://xicng.net/reinhold-leinfelder/)
14.09.2023	Leinfelder, R., Über(s)leben im Anthropozän - Notwendigkeiten, Herausforderungen und Chancen in Zeiten des Wandel	Online event on the annual theme of 'surviving in times of change', Catholic adult education in the diocese of Trier in cooperation with the University for Social Design, Koblenz; youtube-recording: https://www.youtube.com/watch?v=eynhig75CNQ

Date	Conference/Meeting Title	Organisation/Venue
19.10.2023	Leinfelder, R., CultureNature Literacy als integratives Bildungskonzept für das Anthropozän, Invited Keynote	Multiplier Event of the Erasmus project CultureNature Literacy, "CultureNature Literacy: Cultural Sustainability as a Transformative Educational Concept" at Ludwig-Maximilians-Universität Munich
23.10.2023	Leinfelder, R., Energie und Ökologie im Anthropozän,	Lecture series on environmental studies - energy and ecology. University of Augsburg (Environmental Science Centre and Institute of Geography) / Bavarian State Office for the Environment, (Programm https://www.lfu.bayern.de/veranstaltungen/vortragsreihen/doc/vortragsreihen.pdf)

Francine McCarthy

Date	Conference/Meeting Title	Organisation/Venue
11.07.2023	McCarthy, F.M.G., Patterson, R.T., Head, M.J., et al. (2023). Signature of the Great Acceleration in the varved succession at Crawford Lake, Milton, Ontario, Canada: implications for the Anthropocene as a series/ epoch.	Strati2023, Lille, France, July 11-14, 2023.
14-20.07.2023	Patterson, R.T., McCarthy, F.M.G., Head, M.J., et al. (2023) The Anthropocene record preserved in the annually laminated succession of Crawford Lake, Ontario, Canada.	INQUA Congress, Rome, Italy, July 14-20.
18.08.2023	Meeting with members of Canadian Parliament MPs Pam Damoff & Adam Van Koeverden	Crawford Lake, Canada
03.10.2023	"Crawford Lake and the Anthropocene" Panel Discussion	Currelly Legacy Society, Royal Ontario Museum
16.10.2023	McCarthy, F.M.G. (2023) Why propose a GSSP for the Anthropocene in a freeze core from Crawford Lake, Canada? Invited presentation.	Geological Society of America Annual Meeting, Pittsburgh, PA, USA Oct. 16-20, 2023.
19.10.2023	Why propose a GSSP for the Anthropocene in a freeze core from Crawford Lake, Canada? What's so special about this lake??? Guest Lecture	Union College, Schenectady, NY
20.10.2023	"Is the end of the Holocene Epoch recorded in a freeze core from Crawford Lake, Canada?" Guest Lecture	University of Massachusetts, Amherst, MA.
04.11.2023	McCarthy, F.M.G. (2023) Are we living in the Anthropocene? Humans permanently altered our planet. It's time to act.	TEDx Manhattan Beach, CA, USA November 4, 2023 https://youtu.be/Y1YhXFAxWkA?si=aEIZoX_zICD8Cifj

Date	Conference/Meeting Title	Organisation/Venue
23.11.2023	“Are we now living in the Anthropocene?”	Niagara Falls Museum, Niagara Falls, Ontario
29.11.2023	“Is the beginning of the Anthropocene in a freeze core from Crawford Lake, Canada?” Guest Lecture	Geological Survey of Canada-Atlantic Science Hour.
08.12.2023	“Do sediments from Crawford Lake record a human-induced planetary shift?” Keynote Speaker	McMaster University Faculty of Science Graduate Symposium.
29.01.2024	“The boundless significance of a small Canadian Lake.” Guest Lecture	Georgetown University, Washington DC

John McNeill

Date	Conference/Meeting Title	Organisation/Venue
25.02.2023	“The Anthropocene,”	University of Scranton
23.08.2023	“The Great Acceleration and Will Steffen,”	European Society for Environmental History meetings, Bern, Switzerland
12.10.2023	“The Anthropocene,”	Illinois State Conservation Department

Barbara Fiałkiewicz-Kozieł

Date	Conference/Meeting Title	Organisation/Venue
4-7.02.2023	Depozycja markerów antropocenu w torfowiskach górskich	PAKT dla mokradeł, Warszawa, 4-7.02.2023
17.03.2023	Jak pęd ku nowoczesności przyczynił się do powstania nowej epoki czyli teoria antropocenu	Różne oblicza geografii (Different faces of Geography) – meeting with secondary school students
17.03.2023	Jak pęd ku nowoczesności przyczynił się do powstania nowej epoki czyli teoria antropocenu	Różne oblicza geografii (Different faces of Geography) – meeting with secondary school students
13-21.07.2023	Eurasian peatlands as valuable deposits of the synchronous Anthropocene Signal	INQUA Congress, Rome, Italy, July 14-20.
13-21.07.2023	The Śnieżka peatland as a candidate for the Global Boundary Stratotype Section and Point for the Anthropocene Series	INQUA Congress, Rome, Italy, July 14-20.

Agnieszka Gałuszka

Date	Conference/Meeting Title	Organisation/Venue
11.09.2023	Inauguration lecture: Human–environment relationship in the geological Anthropocene (presented in Polish).	XXXVI Maria Dudzikowa Summer School of Young Pedagogues, Kielce (Poland)

Yoshi Saito

Date	Conference/Meeting Title	Organisation/Venue
29.06 .2023	The Seventh Biennial Conference of East Asian Environmental History (EAEH,2023) "Asian deltas/estuaries and the Anthropocene"	Association for East Asian Environmental History, and others / IBS, Daejeon, Korea
29.06 .2023	The Seventh Biennial Conference of East Asian Environmental History (EAEH2023) "GSSPs and the Anthropocene: Present status"	Association for East Asian Environmental History, and others / IBS, KAIST, Daejeon, Korea

Colin Summerhayes

Date	Conference/Meeting Title	Organisation/Venue
13.04 .2023	"Sea Level Change through the Phanerozoic and into the Anthropocene"	Mole Valley Geological Society, Dorking, UK
02.06 .2023	"The Anthropocene: a New Geological Epoch?"	Farnham Geological Society, UK

Simon Turner

Date	Conference/Meeting/Title	Organisation/Venue
08.03. 23	Locating the Anthropocene: Markers, meaning, implications. <i>The Anthropocene Epoch in geological strata: detecting a "golden-spike" and the start of the Anthropocene</i> & "Plastics as a marker for the Anthropocene"	UCL Anthropocene, University College London, UK (online)
31.03. 2023	An Aesthetic Enquiry of the Anthropocene. "Defining a golden spike for the stratigraphic Anthropocene".	British Academy Conference, Royal Society, London
16.06. 2023	1 st National Conference on Anthropocene Science "Defining a golden spike for the stratigraphic Anthropocene"	Chinese Academy of Sciences, Xi'an, China
26.06. 2023	The Seventh Biennial Conference of East Asian Environmental History (EAEH2023). "A golden spike for the stratigraphic Anthropocene".	Center for Anthropocene Studies/KAIST, Daejeon, Republic of Korea
17.09. 2023	XXI International Union for Quaternary Research (INQUA) Congress. "The Anthropocene as a tool for characterizing recent planetary change and predicting future environmental challenges".	INQUA, Sapienza University, Rome, Italy
26.09 2023	Radionuclide distributions in (time-resolved) natural archives determined by AMS. Session A7.1 (Hain <i>et al.</i>	MIGRATION 2023, Nantes, France https://migration2023.sciencesconf.org/data/pages/Migration_2023_Program_v1_10_with_posters_print_version_10082023.pdf

Date	Conference/Meeting/Title	Organisation/Venue
14.11. 2023	also including Andy Cundy & Jens Zinke) The Anthropocene; Impacts and Sustainability of Earth System Development. <i>“The formal stratigraphic Anthropocene epoch”</i>	IGCP 732/Chinese Academy of Sciences, Xi’an, China
12.03. 2024	Complementary Actinide Markers for the Anthropocene in Coral Cores. Poster MS.4. (Zoufal <i>et al.</i> also including Andy Cundy & Jens Zinke)	Der Deutschen Physikalischen Gesellschaft (DPG), Freiburg 2024 https://www.dpg-verhandlungen.de/year/2024/conference/freiburg/part/ms/session/4

Davor Vidas

Date	Conference/Meeting Title	Organisation/Venue
31.03. 2023	Vidas, D. ‘The Law of the Sea and Sea Level Rise: How Have the UN Bodies Contributed So Far?’, Invited Speech at the International Conference <i>Revisiting the Role of the UN in the Architecture of International Law</i>	University of Rijeka, Faculty of Law and the Croatian Academy of Sciences and Arts (Adriatic Institute). Rijeka, Croatia
02.05. 2023	Vidas, D. ‘The definition of baseline and its relevance to the question of statehood and options for clarifying the legal uncertainties’, Invited Talk at the High-Level Roundtable Discussion on <i>Sea-Level Rise – Legal Implications for Statehood</i>	Columbia University School of International Affairs and the Rising Nations Initiative. New York, USA
09.06. 2023	Vidas, D. ‘Legal Certainty and Stability in the Context of Sea Level Rise and the UN Convention on the Law of the Sea: A Comment on Recent Trends in State Practice’, at the international conference on <i>Sea Level Rise and Its International Law Implications for Legal Certainty, Stability and Human Rights</i>	University of Bern, World Trade Institute and the Fridtjof Nansen Institute. Bern, Switzerland

Michael Wagreich

Date	Conference/Meeting Title	Organisation/Venue
29.03. 2023	Das Anthropozän - ein neues geologisches Zeitalter	Natural History Museum, Vienna, Austria
23 – 28.04. 2023	Hatzenbühler, D., Weißl, M., Baumgartner, C., and Wagreich, M.: Searching for the bomb spike in Danube river sediments: Extracting the anthropogenic impact of Vienna, EGU23-8174, https://doi.org/10.5194/egusphere-egu23-8174	EGU General Assembly 2023, Vienna, Austria

Date	Conference/Meeting Title	Organisation/Venue
23-28.04 2023	Weissl, M., Hatzenbühler, D., Baumgartner, C., Wagreich, M., 'From Romans to the Anthropocene: Geoarchaeological Investigations in the Central Vienna Basin (Austria), , EGU23-12871, https://doi.org/10.5194/egusphere-egu23-12871 .	EGU General Assembly 2023, Vienna, Austria
12-16.06. 2023	Hatzenbühler, D., Weißl, M., Baumgartner, C., Wagreich, M.: Extracting the fingerprint of a city's history: The anthropogenic impact of Vienna as seen in downstream Danube river sediments, ,	IAS 2023, Dubrovnik, Croatia
11-13.07. 2023	Hatzenbühler, D., Weißl, M., Baumgartner, C., Wagreich, M.: Anthropogenic stratigraphic signals downstream a metropolis: Extracting Vienna's impact from Danube river plain archives.	STRATI2023, Lille, France
04.04. 2023	The Anthropocene	Public Lecture at the kärnten.museum, Klagenfurt, Austria

Colin Waters

Date	Conference/Meeting Title	Organisation/Venue
10.05. 2023	Magna Conference, keynote	Academia Brasileira de Ciencias, Rio de Janeiro
16.06. 2023	1 st National Conference on Anthropocene Science	Chinese Academy of Sciences, Xi'an, China, Online
11.06. 2023	Understanding 'event stratigraphy' in the context of Anthropocene definition	Strati 2023, 45th International Congress on Stratigraphy, Lille ICS Subcommission session SC2, Abstract: https://strati2023.sciencesconf.org/457410
11.06. 2023	Stratigraphic enrichment into the Anthropocene: a proliferation of proxies allowing ultra-high resolution of a transformed Earth System	Strati 2023, 45th International Congress on Stratigraphy, Lille ICS Subcommission session SC2, Abstract: https://strati2023.sciencesconf.org/458580
14.07. 2023	Café Geológico, Geological Survey of Brazil	Online, Brazil
01.12. 2023.	7 th 'GIS Day for Education'	Online, Bulgaria
07.02. 2024	Lichfield Science & Engineering Society	Garrick Studio Theatre, Lichfield

Mark Williams

Date	Conference/Meeting Title	Organisation/Venue
12.01. 2023	Glasgow Geological Society 'The Anthropocene: a planetary scale change to the biosphere and the future wellbeing of planet Earth'	Glasgow University, Under the auspices of the Palaeontological Association Exceptional Lecturer for 2022-3

Date	Conference/Meeting Title	Organisation/Venue
29.03. 2023	An aesthetic enquiry of the Anthropocene 'Cities and the Anthropocene'	British Academy, London
17.04. 2023	Lausanne University (invited talk) 'The Anthropocene: a planetary scale change'	Lausanne University, Under the auspices of the Palaeontological Association Exceptional Lecturer for 2022-3
21.05. 2023	Japan Geophysical Union Annual Meeting 'Planetary-scale change to the biosphere leaves a fossil record of the Anthropocene'	Chiba, Japan (given remotely)
23.06. 2023	Habitabilities Symposium, Paris 'An index of habitability for planet Earth'	Paris City University
29.06. 2023	Cave Bureau (opening of a major exhibition at the gallery) 'The buried rivers of our cities'	Louisiana Museum and Gallery, Denmark
27.07. 2023	3rd International Seminar on Natural Resources and Environmental Management, 2023 'Global environmental change in the Anthropocene: documenting the record of a planetary crisis'	Bogor Agricultural University, Indonesia (given remotely)
20.10. 2023	The Anthropocene: from boundaries to bounds. 'Cities frame our unsustainable relationship with the natural world in the Anthropocene'	Wroclaw University of Science and Technology, Poland
17.11. 2023	Annual IGCP 732 meeting and workshop on the Anthropocene, Xi'an, China 'Palaeontological signatures of the Anthropocene diverge from past patterns of biotic change'	Institute of Earth Environment, Chinese Academy of Sciences, Xi'an, China (given remotely)

AWG in the MEDIA (i) (websites, internet news, radio)

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Reinhold Leinfelder	15.12.2022	Süddeutsche Zeitung: Eine Heimat für das Anthropozän. Geoforscher wollen eine neue erdgeschichtliche Epoche ausrufen. Neun Plätze auf der Erde stehen dafür als Namensspender zur Auswahl. An allen zeigt sich der Einfluss des Menschen überdeutlich. (print, ePaper, Wissen, Nr. 289, S.12). Online Version v. 14 Dec 2022 https://www.sueddeutsche.de/projekte/artikel/wissen/anthropozan-definition-beginn-klimawandel-geologie-e591275/?ieditorial=1
Reinhold Leinfelder	9.03.2023	Deutsche Welle, DW Nature and Environment: Climate in the Classroom (Audio Podcast) (from min 19:30 onward on the Anthropocene and the Anthropocene Working Group), https://www.dw.com/en/climate-in-the-classroom/audio-64935394
Reinhold Leinfelder	20-21.06.2023	TV-Phoenix: Anthropozän - Das Zeitalter des Menschen, Teil 1-3 (Erde, Wasser, Luft), 20.06.2023, 20:15: Erde, 21:00: Luft; 21.06.2023, 20:15: Wasser. (Scientific advice from H.R. Bork, M. Glaubrecht, R. Leinfelder, R. Simek), mediathek: https://www.ardmediathek.de/suche/Anthropozän%20-%20Das%20Zeitalter%20des%20Menschen
Reinhold Leinfelder	11.07.2023	ANTHROPOZÄN-Fachkommission: Das Zeitalter des Menschen begann 1950, https://www.geo.de/wissen/forschung-und-technik/das-zeitalter-des-menschen-begann-1950-33637648.html GEO-Magazin / dpa (German Press Agency, Valentin Frimmer); and many other German newspapers
Reinhold Leinfelder	12.07.2023	Bayerischer Rundfunk, Radio Bayern 2, IQ Wissenschaft und Forschung: Epochenwende Anthropozän, Crawford Lake, https://www.br.de/radio/bayern2/sendungen/iq-wissenschaft-und-forschung/anthropozan-crawfordlake-hoergeraete-100.html
Reinhold Leinfelder	14.07.2023	Campus.leben, Freie Universität Berlin, Chronik einer angekündigten Katastrophe. Wie der kanadische Crawford Lake den menschlichen Fußabdruck archiviert: ein Interview mit dem Geologen Reinhold Leinfelder. fu-berlin.de/campusleben/campus/2023/230713-interview-leinfelder-crawford-lake/index.html .

Reinhold Leinfelder	16.07.2023	Spektrum SciLogs, Crawford Lake, Ontario, Kanada - Der Kandidat für die formale stratigraphische Definition des Anthropozäns. "Der Anthropozäniker"- Blog: scilogs.spektrum.de/der-anthropozaeniker/crawford-lake/
Reinhold Leinfelder	24.07.2023	Freie Universität Berlin, featured stories, Chronicle of a Catastrophe Foretold. How Crawford Lake in Canada is keeping a record of humanity's impact on the natural world - interview with geologist Reinhold Leinfelder. fu-berlin.de/en/featured-stories/campus/2023/anthropocene-crawford-lake/index.html .
Reinhold Leinfelder	26.07.2023	Berliner Zeitung, Das Anthropozän begann um 1950. Der Mensch hat ein ganz neues Erdzeitalter eingeläutet, sagen Fachleute. Beim Vorschlag für die Datierung des Beginns spielt ein See in Kanada eine Rolle. https://www.berliner-zeitung.de/zukunft-technologie/das-anthropozaen-begann-um-1950-golden-spike-fuer-das-zeitalter-des-menschen-li.372665
Reinhold Leinfelder	8.10.2023	Tagesspiegel, Wie das Buch der Erdgeschichte ein neues Kapitel bekam. In seiner "Science Graphic Novel" zum Anthropozän überlässt Reinhold Leinfelder der Zeit selbst das Wort. https://www.tagesspiegel.de/comic-zum-anthropozan-wie-das-buch-der-erdgeschichte-ein-neues-kapitel-bekam-10576381.html
Reinhold Leinfelder	15.10.2023	Spektrum SciLogs, Die Zähmung der Zeit - Ein Goldener Nagel für das Anthropozän. "Der Anthropozäniker"-Blog; https://scilogs.spektrum.de/der-anthropozaeniker/die-zaehmung-der-zeit-ein-goldener-nagel-fuer-das-anthropozaen/
Reinhold Leinfelder	10.11.2023	Deutsche Welle Indonesia, Manusia Berbahaya bagi Bumi? Jumlah energi yang diperlukan manusia saat ini tidak terbayangkan di abad sebelumnya. Bersamaan dengan itu, manusia merusak sumber hidup esensial. Untuk keperluan apa saja energi itu dan bagaimana batasi kerusakannya? dw.com/id/manusia-berbahaya-bagi-bumi/a-67301072 Also via Tempo (Indonesia): https://www.dw.com/id/manusia-berbahaya-bagi-bumi/a-67301072
Reinhold Leinfelder	14.11.2023	Featured Story about Freie Universität Berlin, "Taming Time" - Writing a New Chapter in Earth's History. Freie Universität professor, Reinhold Leinfelder, gives time a voice in his "science graphic novel". > fu-berlin.de/en/featured-stories/research/2023/taming-time/index.html
Reinhold Leinfelder	18.01.2024	p 55: Frankfurter Allgemeine Sonntagszeitung, "Die Archäologen von morgen werden viel zu tun haben" Interview with Reinhold Leinfelder print/ePaper; online-Web preview, 16 Jan 2024: https://www.faz.net/aktuell/wissen/kein-muell-historie-archaeologen-erforschen-die-moderne-19521700.html#archaologie-von-morgen
Francine McCarthy	12.01.2023	"Did the Anthropocene Begin in Ontario?" The Agenda with Steve Paikin, TVO
Francine McCarthy	24.04.2023	"Why the 'Great Acceleration' is giving the Anthropocene an identity crisis." Ideas, CBC Radio
Francine McCarthy	23.06.2023	"Crawford Lake and the Anthropocene", Washington Post
Francine McCarthy	11.07.2023	"Canada's Crawford Lake chosen as 'golden spike' to mark proposed new epoch", CBC News,
Francine McCarthy	11.07.2023	"Why this Ontario lake has been chosen to help mark a planetary milestone?", Toronto Star,
Francine McCarthy	11.07.2023	"The Anthropocene is here — and tiny Crawford Lake has been chosen as the global ground zero",

Francine McCarthy	11.07.2023	"The Canadian lake that marks when humans started changing the planet", The Globe and Mail
Francine McCarthy	11.07.2023	"The Anthropocene Epoch, Marked by Human Impact on Earth, Began in the 1950s", Time Magazine,
Francine McCarthy	12.07.2023	"Anthropocene", Consider This, National Public Radio
Francine McCarthy	15.07.2023	"Canadian Lake chosen to mark the start of the Anthropocene", New Scientist
Francine McCarthy	22.07.2023	"Crawford Lake as "ground zero" for the Anthropocene epoch", The Climate Crisis, Times Radio
Francine McCarthy	11.08.2023	"Crawford Lake – Defining the Anthropocene", The Social, CTV Bell Media
Francine McCarthy	11.08.2023	"Le lac de l'anthropocène, Découverte, Radio Canada, September 11, 2023
Francine McCarthy	11.08.2023	" Crawford Lake – Nachweis einer neuen Epoche? " Heute Journal, ZDF
Francine McCarthy	13.08.2023	"Layers of Meaning: Francine McCarthy on the Anthropocene". Canadian Geographic Magazine https://canadiangeographic.ca/articles/layers-of-meaning-francine-mccarthy-on-the-anthropocene/
Yoshi Saito	21.02.2023	Comment on the Beppu Bay candidate site for the Anthropocene GSSP. Yomiuri-Shinbun (newspaper) https://www.yomiuri.co.jp/science/20230220-OYT1T50179/
Simon Turner	01.03.2023	[뉴스&인터뷰] 남극, 호주, 일본, 캐나다... 인류세의 기준이 될 지역은? http://dl.dongascience.com/magazine/view/S202303N011
Simon Turner	03.07.2023	Donga Science, 03-2023, Vol 447 Lee Changwook 이르면 내년 '인류세' 지정...새 지질시대 증거 후보는 플루토늄 https://www.hani.co.kr/arti/society/environment/1098417.html The Hankyoreh, Korea, Nam Jong-young
Simon Turner	15.07.2023	The British scientist helping to chart Earth's new age – in concrete grey https://www.thetimes.co.uk/article/simon-turner-anthropocene-the-british-scientist-charting-earth-s-new-era-in-concrete-grey-xsvqtgs0f , The Times, (UK), Adam Vaughan
Vidas, Davor	27.03.2023	'Who owns the ocean of a sinking island nation?' (Hvem eier havet til en øystat som sinker?) (In Norwegian). <i>Forskning.no</i> , at: https://www.forskning.no/fridtjof-nansens-institutt-havet-juridiske-fag/hvem-eier-havet-til-en-oystat-som-synker/2171274
Vidas, Davor	16.06.2023	'Bern Conference on Sea Level Rise', <i>Fridtjof Nansen Institute News</i> , at: https://www.fni.no/news/bern-conference-on-sea-level-rise
Wagreich	11.07.2023	Plutonium in kanadischem See soll Beginn des Anthropozäns markieren. DerStandard.at
Wagreich	04.10.2023	Die Donau als stille Zeugin des Anthropozäns. DerStandard.at
Colin Waters	23.1.23, 16.2.23 & 9.6.23	Sarah Kaplan, Washington Post
Colin Waters	25.1.23	Aurélie Coulon, Le Temps, Geneva
Colin Waters	27.1.23	Meghie Rodrigues, Folha de São Paulo newspaper, Brazil
Colin Waters	29.1.23	Cédric Defert, ARTE filming
Colin Waters	1.2.23	Selmin Kara
Colin Waters	17.3.23	Minako Kurachi, NHK filming at Leicester
Colin Waters	14.4.23	Marlowe Hood, Agence France Presse
Colin Waters	5.5.23	Lucas Lacerda, Folha de São Paulo newspaper, Brazil
Colin Waters	13.6.23	Neel Dhanesha, Heatmap

Colin Waters	28.6.23	Raymond Zhong, NY Times
Colin Waters	30.6.23	Alexandra Witze, Nature
Colin Waters	30.6.23	Paul Voosen, Science
Colin Waters	6.7.23	Science Media Center, Germany press briefing
Colin Waters	6.7.23	Seth Borenstein, Associated Press
Colin Waters	6.7.23 & 30.11.23	Chen Ly, New Scientist
Colin Waters	9.7.2023	Ivan Semeniuk, Globe and Mail
Colin Waters	17.7.2023	Elida Hoeg, Morgenbladet, Norway
Colin Waters	21.7.2023	Jim Herlihy podcast, The San Francisco Experience
Colin Waters	23.7.2023	Srijana Mitra Das, Senior Editor The Times of India
Colin Waters	25.7.2023	Katherine Kornei AGU EOS
Colin Waters	27.9.2023	Joe Grabowski, Exploring by the Seat of Your Pants (EBTSOYP) Updates for the Edge
Colin Waters	5.12.2023	Mia Parker, Carleton University
Jens Zinke (and Neil Rose)	09.02.2024	Pollutants from fossil fuels are embedded in coral skeletons https://www.earth.com/news/pollutants-from-fossil-fuels-are-embedded-in-coral-skeletons/
		Scientists spot pollutant marks on coral for first time https://talker.news/uk/2024/02/09/scientists-spot-pollutant-marks-on-coral-for-first-time/
		Tracking the history of pollution through corals https://isp.today/tracking-the-history-of-pollution-through-corals/
		Corals Unveil Hidden Record of Industrial Pollution https://www.azocleantech.com/news.aspx?newsID=34593
		Schadstoffe aus fossiler Verbrennung erstmals in Korallennachgewiesen https://www.mdr.de/wissen/news/korallen-kohlenstoff-ablagerung-fossile-energie-industrie-100.html
Jens Zinke (and Neil Rose)	14.02.2024	New tool that detects pollutants in corals has revealed historic contamination patterns https://www.awe.international/article/1861357/new-tool-detects-pollutants-corals-revealed-historic-contamination-patterns

MEMBERSHIP TO DATE

Listed here are names of members to date and their contact details (as of 1st January 2024). Membership is distinguished between voting and advisory. Voting members voted on the GSSP and SABSS candidate selections. * Deceased.

An Zhisheng (Advisory)

State Key Laboratory of Loess and Quaternary Geology, The Institute of the Earth Environment, Chinese Academy of Sciences (CAS), 10 Fenghui South Road, Xi'an High-Tech Zone, Xi'an 710075, China
e-mail: anzs@loess.llqg.ac.cn

Tony Barnosky (Voting)

Department of Integrative Biology, University of California, Berkeley, CA 94720USA.
e-mail: barnosky@berkeley.edu

Alejandro Cearreta (Voting)

Departamento de Geología, Facultad de Ciencia y Tecnología, Universidad del País Vasco UPV/EHU, Apartado 644, 48080 Bilbao, Spain
e-mail: alejandro.cearreta@ehu.eus

Andy Cundy (Voting)

School of Ocean and Earth Science, National Oceanography Centre (Southampton) University of Southampton, European Way, Southampton, SO14 3ZH, UK
e-mail: A.Cundy@noc.soton.ac.uk

Ian Fairchild (Voting)

School of Geography, Earth and Environmental Sciences, University of Birmingham B15 2TT, UK
e-mail: i.j.fairchild@bham.ac.uk

Barbara Fiałkiewicz-Kozieł (Voting)

Biogeochemistry Research Unit, Faculty of Geographical and Geological Sciences, Adam Mickiewicz University, 61-712 Poznań, Poland
e-mail: barbara.fialkiewicz-koziel@amu.edu.pl

Agnieszka Gałuszka (Voting)

Institute of Chemistry, Jan Kochanowski University
7 Uniwersytecka St, 25-406 Kielce, Poland.
e-mail: aggie@ujk.edu.pl

Jacques Grinevald (Advisory)

IHEID, Chemin Eugène Rigot 2, 1211 Genève 11 Switzerland
e-mail: jacques.grinevald@graduateinstitute.ch

Peter Haff (Advisory)*

Nicholas School of the Environment, Duke University,
103 Old Chem Box 90320 Durham NC27708 USA
e-mail: pkhaff@gmail.com

Irka Hajdas (Voting)

Laboratory of Ion Beam Physics, ETH Otto-Stern-Weg 5, 8093 Zurich, Switzerland
e-mail: hajdas@phys.ethz.ch

Han Yongming (Voting)

State Key Laboratory of Loess and Quaternary Geology, The Institute of the Earth Environment, Chinese Academy of Sciences (CAS), 10 Fenghui South Road, Xi'an High-Tech Zone, Xi'an 710075, China
e-mail: yongming@ieecas.cn

Martin Head (Voting)

Department of Earth Sciences, Brock University, 1812 Sir Isaac Brock Way, St. Catharines, ON, L2S 3A1 Canada
e-mail mjhead@brocku.ca

Juliana Assunção Ivar do Sul (Advisory)

Leibniz Institute for Baltic Sea Research Warnemünde (IOW)
Seestrasse 15, 18119 Rostock – Germany
e-mail: juliana.ivardosul@io-warnemuende.de

Catherine Jeandel (Advisory)

LEGOS, Université de Toulouse, CNES, CNRS, IRD, 14 avenue Edouard Belin, 31400 Toulouse, France.
e-mail: catherine.jeandel@legos.obs-mip.fr

Reinhold Leinfelder (Voting)

Dept. of Geological Sciences, Freie
Universität Berlin,
Malteserstraße 74 - 100, building D, D-
12249 Berlin, Germany
e-mail: reinhold.leinfelder@fu-berlin.de

Francine McCarthy (Voting)

Department of Earth Sciences, Brock
University, 1812 Sir Isaac Brock Way, St.
Catharines, ON, L2S 3A1 Canada
e-mail: fmccarthy@brocku.ca

John McNeill (Advisory)

Georgetown University Washington DC USA
e-mail: mcneillj@georgetown.edu

Eric Odada (Advisory)

Geology Department, University of Nairobi,
Chiromo Campus, Riverside Drive, P.O. Box
30197. Nairobi, Kenya
e-mail: eodada@uonbi.ac.ke

Naomi Oreskes (Advisory)

The Department of the History of Science,
Harvard University, Cambridge,
MA 02138, USA
e-mail: oreskes@fas.harvard.edu

Clément Poirier (Advisory)

Morphodynamique Continentale et Côtière,
Normandie Université, UNICAEN,
UNIROUEN, CNRS; M2C, 24 rue des Tilleuls,
F-14000 Caen, France
e-mail: clement.poirier@unicaen.fr

Dan Richter (Advisory)

Nicholas School of the Environment
Duke University, 9 Circuit Drive, Box 90328,
Durham, NC 27708, USA
e-mail: drichter@duke.edu

Neil Rose (Voting)

Environmental Change Research Centre,
Department of Geography,
University College London, Gower Street,
London WC1E 6BT, UK
e-mail: n.rose@ucl.ac.uk

Yoshiki Saito (Voting)

Estuary Research Center, Shimane
University, 1060, Nishikawatsu-cho,
Matsue, 690-8504, Japan
e-mail: ysaito@soc.shimane-u.ac.jp

Bill Shotyk (Advisory)

Department of Renewable Resources,
University of Alberta, 348B South Academic
Building, Edmonton, Alberta T6G 2H1,
Canada
e-mail: shotyk@ualberta.ca

Colin Summerhayes (Voting)

Scott Polar Research Institute, University of
Cambridge, Lensfield Road,
Cambridge CB2 1ER, UK
e-mail: cps32@cam.ac.uk

Jaia Syvitski (Voting)

Institute of Arctic and Alpine Research,
University of Colorado, Boulder Campus,
Box 545, Boulder CO, 80309-0545, USA
e-mail: jai.syvitski@colorado.edu

Simon Turner (Secretary, Voting)

Environmental Change Research Centre,
Department of Geography,
University College London, Gower Street,
London WC1E 6BT, UK
e-mail: simon.turner@ucl.ac.uk

Davor Vidas (Advisory)

Law of the Sea and Marine Affairs
Programme, The Fridtjof Nansen Institute,
Fridtjof Nansens vei 17, PO Box 326, 1326
Lysaker, Norway
e-mail: Davor.Vidas@fni.no

Michael Wagreich (Voting)

Department of Geology, University of
Vienna Althanstrasse 14, A-1090 Vienna,
Austria
e-mail: michael.wagreich@univie.ac.at

Colin Waters (Chair, Voting)

School of Geography, Geology and the
Environment, University of Leicester,
University Road, Leicester LE1 7RH, UK
e-mail: cw398@leicester.ac.uk

Mark Williams (Voting)

School of Geography, Geology and the Environment, University of Leicester, University Road, Leicester LE1 7RH, UK
e-mail: mri@leicester.ac.uk

Scott Wing (Voting)

Dept. of Paleobiology, Museum of Natural History, Smithsonian Institution, Washington DC, 20013 USA.
e-mail: wings@si.edu

Jan Zalasiewicz (Voting)

School of Geography, Geology and the Environment, University of Leicester, University Road, Leicester LE1 7RH, UK
e-mail: jaz1@leicester.ac.uk

Jens Zinke (Voting)

School of Geography, Geology and the Environment, University of Leicester, University Road, Leicester LE1 7RH, UK
e-mail: jz262@leicester.ac.uk

NEWS

15-19th November 2023. IGCP 732 Language of the Anthropocene annual meeting in Xi'an, China. Workshop 'The Anthropocene - Impacts and Sustainability of Earth System development'.

Reinhold Leinfelder: Production and publication of the Graphic Science Novel "'Taming Time - A Golden Spike for the Anthropocene" (by Alexandra Hamann, Reinhold Leinfelder & Maki Shimizu, with support by Jan Zalasiewicz, Colin W. Waters, Simon Turner and Mark Williams and others), based on the AWG studies and Reinhold Leinfelder's university lecture course "The Anthropocene Concept" (Freie Universität Berlin). Open Access, free download of eBook via <https://dx.doi.org/10.17169/refubium-40617>
For more information see <https://tamingtime.de>

Barbara Fiałkiewicz-Kozieł habilitation thesis "Geochemical record of human activity in selected Eurasian peat deposits as a tool to define the lower boundary of the Anthropocene"

Agnieszka Gałuszka: Introduction to Polish edition and reviewing translation of the book L'Anthropocène décodé pour les humains (Antropocen bez tajemnic) by Nathanaël Wallenhorst, translated by Dorota Ostrowska-Furmanek. Edu-Libri. ISBN: 978-83-66395-52-7.

Simon Turner – New Scientist 2023>2024

Illustrative of the ongoing public perception of what and when is the Anthropocene, I have compiled here for the record a timeline of articles published in the New Scientist (UK) this year.

11.07.2023. 'Canadian lake chosen to mark the start of the Anthropocene'.

<https://www.newscientist.com/article/2381867-canadian-lake-selected-as-site-to-mark-the-start-of-the-anthropocene/>, New Scientist, Chen Ly

06.09.2023 The proposed Anthropocene definition is unscientific and harmful

<https://www.newscientist.com/article/mg25934553-400-the-proposed-anthropocene-definition-is-unscientific-and-harmful/> New Scientist, Comment and Environment, Erle Ellis

20.09.2023 On the starting point for a new geological epoch (1)

<https://www.newscientist.com/letter/mg25934570-300-on-the-starting-point-for-a-new-geological-epoch-1/> New Scientist, Letters, Zalasiewicz, J., Head, M., Turner, S., Waters, C., & Williams, M.

20.09.2023 On the starting point for a new geological epoch (2)

<https://www.newscientist.com/letter/mg25934570-300-on-the-starting-point-for-a-new-geological-epoch-2/> New Scientist, Letters, Dave Smith

27.09.2023 Climate-trashing era began with white supremacists

<https://www.newscientist.com/letter/mg25934580-300-climate-trashing-era-began-with-white-supremacists/> New Scientist, Letters, Adrin Neatrou

01.11.2023 What to call the opening age of the Anthropocene

<https://www.newscientist.com/letter/mg26034632-400-what-to-call-the-opening-age-of-the-anthropocene/> New Scientist, Letters, Bryn Glover

22.11.2023 We may be at the beginning of The End
<https://www.newscientist.com/letter/mg26034660-300-we-may-be-at-the-beginning-of-the-end/> New Scientist, Letters, Ian Elliott

26.12.2023 We might officially enter the Anthropocene epoch in 2024
<https://www.newscientist.com/article/mg26034712-600-we-might-officially-enter-the-anthropocene-epoch-in-2024/> New Scientist, Earth, Chen Ly

24.01.2024 Is the Anthropocene far older than we thought?
<https://www.newscientist.com/letter/mg26134750-300-is-the-anthropocene-far-older-than-we-thought/> New Scientist, Letters, William Hughes-Games

31.01.2024 Anthropocene stand does not reduce climate concern
<https://www.newscientist.com/letter/mg26134760-300-anthropocene-stand-does-not-reduce-climate-concern/> New Scientist, Letters, Erle Ellis & Phil Gibbard

Davor Vidas

Chair and co-organiser of the international conference on *Sea Level Rise and Its International Law Implications for Legal Certainty, Stability and Human Rights*, organised by the University of Bern, World Trade Institute, in cooperation with the Fridtjof Nansen Institute, held in Bern, Switzerland, 9 June 2023.

Michael Wagreich

Érika Nesta Silva (Brazil) was for several months at Vienna University with an internship granted by FAPESP on the topic “Anthropogenic depositions in Vienna and Brazilian cities (Rondonópolis – MT and Presidente Prudente – SP): analytical possibilities and their correlations”.

Open Lecture series “Aspects of the Anthropocene”, hosted by the University of Vienna (March-June 2023), a cooperation of IGCP 732, the Vienna Anthropocene Network and the Forum Anthropocene. Lectures included a focus on food resources (R.Leinfelder), the impact of agriculture, environmental movements, SDGs, Arts and literature, the sediment cycle of the Anthropocene (Jaia Syvitski) and the formal definition process and progress of the Anthropocene (Simon Turner).

Scott Wing

5th March 2024. Texas State University, San Marcos: “The dawn of an epoch: what the Eocene says about the Anthropocene”.

ANTHROPOCENE WORKING GROUP: PROGRAMME FOR 2024

With submission of the proposal to SQS, and completion of the voting process, the AWG will stand down as an SQS working group and will have no official function as part of ICS. The last formal function is for several members of AWG to attend the 37th International Geological Congress 2024 in Busan, Korea from 25-31 August.

It is envisioned that many members will be keen to continue working together as a loose group investigating the evolving details of the Anthropocene as a concept that encapsulates overwhelming human impact on the geology and Earth System state of the planet. However, this will be the final official AWG Newsletter. From its inception as a working group in 2009, this has been an incredible journey from early exploration of Paul Crutzen's inspired improvisation of the term, through appreciation of the significance of the Great Acceleration championed by Will Steffen and to our current understanding based upon rigorous multi-proxy analysis across diverse environments. The series of newsletters records the vast number of publications, conference presentations and media interviews undertaken by AWG membership. Against significant pressures to the contrary, we have always aspired to ensure that our work has been made open to all see and comment upon, not the work of a closed group making decisions in isolation and without justification. We hope this will be some legacy!

Colin Waters (AWG Chair)
Simon Turner (AWG Secretary)

March 2024