NORTH AMERICAN COMMISSION ON STRATIGRAPHIC NOMENCLATURE

MINUTES 66TH ANNUAL MEETING

Monday, October 10th, 2011, 1:00 – 4:15 p.m.
Hilton Marquette Ballroom V; Minneapolis, Minnesota

1. Meeting called to Order by Vice-chair Easton
   Meeting was Chaired by R.M. Easton, as Chairman P. Sadler was unable to attend and had requested in advance that the Vice-Chair serve in his absence.

2. Approval of Agenda moved (Easton); seconded (Harper) and approved without opposition or abstention

3. Roll called by Vice-chair Easton
   Regrets: Brunton, Fullerton, Lasca, Orndorff, Sadler

AAPG	Robert Scott, Donald Owen, Art Donovan, Ernest Mancini
AASG	David Wunsch, Nick Tew (absent: Ernest Mancini)
GSA	Marie Aubry, Stan Finney, Richard Fluegeman, Bridget Wade (absent: Arthur Bettis)
USGS	Lucy Edwards, Randall Orndorff (absent: David Fullerton)
GSC	Tony Hamblin, Rob Rainbird (absent: Robert Anderson)
CSPG	Brian Pratt (absent: Octavian Catuneau)
GAC	Robert Easton (absent: Frank Bruton)
IGUNAM	Ricardo Barragan-Manzo
SEPM	Howard Harper (absent: Peter Sadler)
AMGP	Elizabeth Solleiro Rebolledo
SoGM	(absent: Emiliano Campos-Madrigal)
SeGM	(absent: Rosario Palomino)
At-Large	Norman Lasca, Ismael Ferrusquia-Villafranca, John Van Couvering, Ashton Embry

   A sheet was circulated for current email addresses – see appendix to these minutes.

4. Approval of Minutes of 65th Annual Meeting, Denver. Moved (Harper); seconded (Edwards) and approved without opposition or abstention

5. Introduction of New Commissioners by Vice-Chair Easton
   Bridget Wade (GSA)

6. Introduction of Guests

Matt Grobe (Alberta Geological Survey) 3-D earth model for Alberta

7. Awards and Recognition

   Ernest Mancini — Awarded the Don R. Boyd Medal for Excellence in Gulf Coast Geology by the Gulf Coast Association of Geological Societies

8. Chair's Report

   The Chair's report was circulated prior to the meeting, and is included as Attachment 1 to these minutes. Two items from the report prompted discussion and/or action by the Commission.

   First was the subject of payment of the American Geoscience Institute (AGI) dues related to NACSN membership in AGI, especially in light of a dues increase for 2012. One notable membership benefit to NACSN is that AGI hosts the NACSN website. Following discussion, Commissioner Van Couvering indicated that *Stratigraphy* could pay the AGI dues as well as other expenses related to the operation of NACSN.

   Motion (moved Van Couvering, seconded Lasca)**:** That NACSN accept the offer from MicroPress, on behalf of *Stratrigraphy*, to pick up the cost of the NACSN meeting and its AGI dues up to a maximum of $500 per year.
   Passed Unanimously

   Second was the subject of the July 2011 meeting of the Subcommission on the Silurian Commission meeting. Commissioner Finney provided the Commission with further details on the problem with some of the existing Silurian GSSPs and details of the process that is being undertaken to eventually correct the problems. No action on this matter is required by NACSN.

9. Vice-Chair's Report

   During the past year, Vice-Chair Sadler monitored the e-mail exchanges on the issue of separate abbreviations for years (age) and years (duration), as well as making the logistical arrangements for the annual meeting. He also assisted Commissioners Orndorff and Lasca in updating the NACSN Commissioners and Officers tables that were in Jordan's 2009 *Stratigraphy* paper for posting on the NACSN website. In addition, in conjunction with Commissioner Rainbird, he submitted a proposal for a GSA topical session (T46; *see* Agenda item 14).

10. Status of French Translation of the Code (Easton)

    Following publication of a Spanish version of the 2005 Code in 2010, informal discussions had been undertaken regarding publication of the 2005 into French, especially since there was already a French version of the 1983 Code (hard-copy only). Vice Chair Easton had agreed to investigate if any Canadian groups were actively pursuing such an effort, and reported that no translation was being planned. Commissioner Aubry offered to look into what would be involved in such a translation. **Action:** Easton agreed to obtain a .pdf version of the 1983 Code in French for Commissioner Aubry so she could make that determination.

11. Amendment to Code on Intrusive Complexes (Easton & Orndorff)

At the 65th Annual Meeting, a motion was passed establishing an ad hoc committee of Nancy Stamm (external), Lucy Edwards, and Mike Easton (chair) with the mandate to submit amendment language (potentially Note 66) to NACSN Chair Sadler by March 2011 to allow "Complex" to become a formal unit. Easton reported that only limited progress had been made to date, but was hoping to have a draft ready to circulate to NACSN by the end of calendar 2011.

12. Task Group on Impact of New Definition of the Pleistocene (Harper & Scott)

This task group was established in 2010 with a mandate to "consider the issue of the new definition of the Pleistocene; whether that new definition is a problem for our profession and, if it is, how it should be dealt with." The task group had determined that conducting a survey of affected geoscience groups was the first step in determining the impact of the new definition. The report on the survey results was circulated prior to meeting, and is a separate attachment to these minutes (Attachment 3).

Considerable discussion followed, much of it related to the process by which the new definition was reached rather than on the specific results of the survey. Several commissioners felt it was necessary to include additional groups in the survey, such as physical anthropologists. **Action:** Commissioners Harper and Scott agreed to expand the survey to additional groups, with a March 31, 2012 deadline for data collection. Results would be reported to the rest of NACSN no later than the 2012 Annual Meeting of the Commission.

13. Report on American Geosciences Institute Council meeting (Houston, April 2011)

Two main topics were mentioned for information purposes. One was the discussion of diversity issues and underprivileged groups within AGI in the context of developing the next generation of geoscientists. The second was the initiative being undertaken by AGI to broaden the teaching of the earth sciences within the K-12 education stream. Again, the goal is to encourage the within the development of the next generation of geoscientists by expanding exposure to the earth sciences earlier in the education stream.

14. Co-sponsored GSA Topical Sessions (lessons from T46 & T101).

Two stratigraphy sessions co-sponsored by NACSN had been proposed for the 2011 GSA Annual Meeting, but neither session gathered enough participants to proceed. There were T46 *Application of New Stratigraphic Tools to Precambrian and Igneous Rocks: Challenges and Solutions* and T101 *Problems in Hydrostratigraphy and the Usage of Its Nomenclature*. A short period of discussion followed regarding why these sessions failed and steps that could be taken to ensure that proposed sessions succeed. It was also mentioned that the next GSA meeting in Charlotte, NC might be an appropriate venue for a Hydrostratigraphy session.

BREAK 2:12-2:35

15. A "Sequence Chronostratigraphic Designation System"
(for information; ***not*** a request for ratification; attachments 2a-b).

This was mainly an information issue, with copies of some recent abstracts concerning recent proposals with respect to Sequence Stratigraphy nomenclature being circulated prior to the meeting (and included as Attachments 2a-b).

It was noted that Commissioner Catuneau has a review paper on Sequence Stratigraphy in press in *Newsletters in Stratigraphy*, which will be available on the ISC website once it is published.

Commissioner Finney reported that a chapter on Sequence Stratigraphy would likely be part of the next edition of the *International Stratigraphic Guide*, however, it will be a couple of years before a draft of that chapter would be ready.

During the discussion that followed on this topic, it was noted that it had been 10 years since NACSN had sponsored a successful Hedberg Conference on the topic of Sequence Stratigraphy (in 2001) and that consideration should be given to hold a similar conference in the next couple of years. Although there was general agreement that this was an excellent suggestion, no specific action was agreed upon.

16. Newly formed Canadian Stratigraphy Commission

Commissioners Pratt and Rainbird provided the Commission with additional information on the Canadian Stratigraphy Commission, which had been mentioned at the 2010 NACSN meeting. Martin Head of Brock University is Chair, Michael Melchin of St. Francis Xavier University is Vice-Chair. Members are appointed by the Canadian Federation of Earth Sciences (CFES) and members represent Canada on the International Stratigraphic Commission. The terms of reference of the Canadian Stratigraphy Commission are attached separately to the minutes as Attachment 4. Additional details are available from their web site athttp://geoscience.ca/index.php?page=canadian-stratigraphy-commission (last accessed Dec 13, 2012). One project they are undertaking is to produce a geologic time scale poster for Canada (similar to the GSA Time Scale poster).

17. AGI President-Elect for 2011

Commissioner Tew excused himself from the meeting at this point.

Commissioner Mancini had written to Chair Sadler that we discuss the possibility of the Commission writing a letter in support of the nomination of Dr. N. Tew for AGI President-Elect. Nominations are due by February 1, 2012. There was unanimous support for the nomination. **Action:** The incoming Chair was tasked with preparing the support letter and ensuring that it was submitted in a timely fashion.

Following discussion of this matter, Commissioner Tew was invited back to the meeting.

18. Other Unfinished and/or New Business

In the 2010 meeting minutes, there was discussion regarding a paper concerning 125 years of stratigraphy manuscript for the upcoming GSA Anniversary. Commissioner Pratt noted that there would be a series of review papers in *GSA Bulletin*, which would eventually be published as a book. The emphasis of these papers would focus primarily on developments in the last 50

years. It was agreed that a summary paper on stratigraphy would be useful, but no specific action was taken.

Commissioner Lasca reminded Commissioners to copy him on matters of Commission business for the purpose of maintaining the Commission archive.

The Chair reminded the Commission of the *Friends of Precambrian Session* being held in the Hilton, Duluth Room, Tuesday, October 11th, 4 to 6PM. The session was being chaired by M. Van Kranendonk, Chairman of the Precambrian Subcommission of ICS.

Commissioner Edwards raised the fact that the last published record of the ***Proceedings of the Commission,*** current to the end of 2002 was published in the *AAPG Bulletin* in 2005 as Note 65. There are now 9 years of minutes to summarize and publish. Now that *Stratigraphy* is the publication of record for NACSN, publication bottlenecks that had previously affected production of these reports are now diminished. **Action:** Commissioner Easton, who had overseen publication of the previous two *Proceedings of the Commission* (Notes 62 and 65), was charged with bringing record up-to-date by preparing a Note for publication in *Stratigraphy* covering the period from 2003 to 2011.

There was renewed discussion on the subject of geological time conventions and symbols with respect to absolute time versus the duration of time. This discussion arose because of publication of the recommendation by IUPAC-IUGS in both *Episodes* and *Pure and Applied Geochemistry* (Holden et al. 2011a, 2011b) recommending the use of annus for both absolute time and duration of time. Several commissioners felt it was necessary to re-inform journal editors and others that the usage recommended in the North American Stratigraphic Code (a for absolute age, y for duration of time) was unchanged despite these recommendations. This had been dome in late 2009 when these proposals first surfaced, but it was felt that restatement was needed. A**ction:** A copy of the resolution on the subject approved at the 64th NACSN meeting in 2009 be re-circulated to Commission members (Attachment 5). A copy of the *Episodes* article by Holden et al. (2011b) be circulated to Commission members (separate Attachment 6). That the 2009 resolution be published in *Stratigraphy*.

Christie-Blick, N, 2012. Geological Time Conventions and Symbols; Geological Society of America, GSA Today, February 2012, v.22, p. 28-29.

Holden, N.E., Bonardi, M.L., De Bièvre, P., Renne, P.R., and Villa, I.M. 2011a. IUPAC-IUGS common definition and convention on the use of the year as a derived unit of time (IUPAC Recommendations 2011); Pure and Applied Chemistry, v. 83, p. 1159–1162.

Holden, N.E., Bonardi, M.L., De Bièvre, P., Renne, P.R., and Villa, I.M. 2011b. IUPAC-IUGS common definition and convention on the use of the year as a derived unit of time (IUPAC-IUGS Recommendations 2011); Episodes, v. 34, no. 1, p. 39–40.

19. Appointment of Nominating Committee for 2011-2012

Vice-chair Easton appointed Robert Scott, Nick Tew and Howard Harper to the Nominating Committee, with the Chair to be determined among the committee members.

20. Presentation of Scrolls

21. Adjournment of the 66th Annual Meeting and Call to Order of 67th Annual Meeting by Vice-chair Easton

22. Report of the Nominating Committee and Election of Officers for 2011-2012
    The committee report recommended Commissioners Easton and Scott for Chair and Vice-Chair, respectively. Commissioner Van Couvering **moved** to accept this report by acclamation. **Motion** carried.

23. Election of Commissioners-at-Large
    Commissioner Embry's term has ended and he did not wish to have his term extended.

24. Remarks by the Incoming Chair
    No remarks were recorded.

25. Recess of the 67th Annual Meeting moved and seconded by Commissioners Edwards and Harper, respectively. **Motion** carried.

Respectfully submitted,

Commissioner Easton
Vice Chair 2011

ATTACHMENT 1: CHAIR'S ACTIVITIES AND REPORT 2011 (Agenda Item 8)

* Most of this report can simply be placed on file and need not take Commissioners' time at the Fall 2011 meeting. At most, the two notes might merit attention.

- Updated NACSN Commissioners and Guests email list (attached)
- Wrote minutes from Fall 2010 meeting, Denver; sent copies to Commissioners Orndorff and Easton; incorporated a correction and addition from Easton (attached).
- Sent Spring and Fall reports of NACSN activities to AGI for their meetings at the AAPG convention and the GSA annual meeting.
- Paid AGI dues.

  * NOTE: These dues rose from $62 to $200 this year. The old formula was $2 per full- time member, defined as those paying at least 75% of Society dues. The new rate is for this amount or $200, whichever is the greater, and the minimum will rise to $250. I did note that the 31 NACSN Commissioners pay no dues and that $0 of $0 might be treated as 0% or 100%. The resulting invoice for $200 did not match my attempt at humor.
- Monitored e-mail exchanges concerning 'ma' and 'myr.' Decided it would not be appropriate for the NACSN Chair to weigh in officially concerning authors' rights to cite or not cite opposing views.
- Voted in favor of new member Societies seeking to join AGI. Two such actions Medical Geology Association; National Cave and Karst Research Institute) were unanimously pre-approved at the NACSN 2010 meeting. One (Association of American Geographers, AAG) was unanticipated and prompted unilateral favorable vote by the chair.
- Attended July 2011 meeting of International Subcommission on the Silurian System. The related field excursion visited the current GSSP sites for Silurian stage boundaries in the Welsh borderland.

  * NOTE: It is likely that several existing GSSPs will be challenged in the near future on the basis of outcrop quality, structural or stratigraphic complexity, and poor yield of useful biostratigraphic information. The Silurian Subcommission acknowledges this and seems poised to tackle the troublesome cases one at a time, starting with the most tractable.
- Responded on behalf of NACSN to two AGI surveys - nothing controversial, mostly motherhood and apple-pie . One concerned outreach efforts of the affiliated societies; the other concerned the role of geosciences to society, education, and professional satisfaction.
- Drafted preliminary agenda for 2011 meeting in Minneapolis (attached).

I acknowledge sterling work all year by Vice-Chair Mike Easton.

Pete Sadler

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ATTACHMENT 2a AAPG Bulletin 2011, v. 95, p. 1095-1122 (Agenda Item 15)

RECOMMENDATIONS FOR A UNIFORM CHRONOSTRATIGRAPHIC DESIGNATION SYSTEM FOR PHANEROZOIC DEPOSITIONAL SEQUENCES

John W. Snedden and Chengjie Liu

Many published sequence-stratigraphic frameworks lack a systematic and consistent designation for both depositional sequences and key surfaces, despite the original goal to provide a fully integrated stratigraphic architecture, including diagnostic age information. Based on a system in use for more than 10 yr at ExxonMobil, we recommend methodologies for a chronostratigraphic designation system (CDS) using more uniform and robust sequence-stratigraphic designations.

After objectively defining important physical stratigraphic surfaces, biostratigraphic and other age-constraining information is used to designate surfaces and the packages of rocks they bound. This leads to the establishment of a sequence chronostratigraphic framework for a local area of investigation (outcrop section, field, region, or basin). Only after demonstrating clear well-documented ties to Phanerozoic global coastal onlaps or cycle charts are these sequences and associated surfaces considered as "global" entities and designated as such. Higher frequency sequences and surfaces are also accommodated in this CDS. Alternative designations for areas with limited or poor quality chronostratigraphic information are also discussed.

The CDS has proven to have great use in all Phanerozoic strata, different tectonic settings, and depositional environments, especially when chronostratigraphic age constraints are robust. We have used this system at regional and basinal scales in many geographic locations to help reduce uncertainty in identifying and correlating reservoirs, sources, and seal rocks. Predicting the local distribution and quality of reservoirs as well as seals within a producing field and near field wildcats is also facilitated by this system. This system has demonstrated use in the correlation of outcrop sections within a basin or between basins.

Rigorous use of the CDS proposed here will permit meaningful regional and/or interbasinal correlation that is difficult to carry out with the diverse systems currently in use. This uniform designation scheme will also facilitate communication within a company and between institutions, as well as among academic investigators.

John Snedden is Director of the Gulf Basin Depositional Synthesis Project at the Institute for Geophysics, University of Texas at Austin. He has extensive experience in applying sequence-stratigraphic techniques to solve problems in exploration, development, production, and research. He worked most recently as a leader of a research team at ExxonMobil Upstream Research Co. in Houston, Texas. His current research interests include ancient and modern deltaic system architecture, modern shelf sand ridge genesis and evolution, sequence-stratigraphic methods, reservoir connectivity analysis, and sedimentology of unconventional reservoirs. He has a Ph.D. in geology from Louisiana State University, an M.S. degree from Texas A&M, and a B.A. degree from Trinity University. He recently compiled the AAPG CD *Getting Started in Deltas*. In 2008, John served as overall technical program co-chair of the AAPG International Convention and Exhibition in Cape Town, South Africa.

Chengjie Liu is a geological advisor at ExxonMobil Exploration Company. He has extensive experience in foraminifer micropaleontology, biostratigraphy, biofacies, and application of strontium stable isotope age dating in stratigraphic studies. His current projects involve biostratigraphy and biofacies for both carbonates and siliciclastics of the Mesozoic–Cenozoic age worldwide. He is also responsible for maintenance and standardization of the ExxonMobil biostratigraphy and sequence chronostratigraphy frameworks and provides consultation for the application of these frameworks for his colleagues. He received his B.S. degree in geology from Beijing University, his M.Sc. degree in geology from the Chinese Academy of Sciences in China, and his Ph.D. in earth sciences from Rutgers University. He has been an active member of the planktonic foraminifer working group (under the International Stratigraphy Commission) since 1991.

ATTACHMENT 2b Background Reading (Agenda Item 15)

Item 15 on the provisional agenda provoked a flurry of e-mails out of concern that this item was a formal request from the authors for some sort of ratification of their ideas. I apologize for the misunderstanding. On the contrary, the agenda item was promoted by a couple of NACSN Commissioners who would encourage the research behind the AAPG Bulletin article but have some skepticism about its merits in any formal chronostratigraphic system. They wish the Commission to be informed and perhaps fore-armed about the resurgence of this issue and potential misunderstanding of the relationship between sequence stratigraphy and chronostratigraphy. E-mails received by your Chair confirm that there would be spirited and well-informed opposition to the "designation system" from the stratigraphic community at large. Accordingly, I solicited the following recommended reading (abstracts only), which Andrew Miall was kind enough to provide for us.

Stratigraphy: v. 1, p. 27-46.

EMPIRICISM AND MODEL-BUILDING IN STRATIGRAPHY: AROUND THE HERMENEUTIC CIRCLE IN THE PURSUIT OF STRATIGRAPHIC CORRELATION

Andrew D. Miall *Department of Geology, University of Toronto*
Charlene E. Miall *Department of Sociology, McMaster University*

ABSTRACT: The discipline of geology has varying theoretical and methodological approaches to the study of the earth and its processes. By focusing on the ways in which geological theories are constructed and tested through the use of various methodologies, it becomes evident that research approaches compete with each other to legitimate their own constructions of scientific knowledge. It also becomes clear that uncritical adherence to theoretical and methodological approaches and assumptions may obscure rather than illuminate objects under study.

The scientific process in geology is exemplified by the *hermeneutic circle* (Frodeman, after Heidegger), in which empirical observation, generalization and theorizing (*induction*), are followed by construction of hypotheses (including models) and renewed observations to test and refine or abandon a theory (*deduction*). Ideally, this is a continuous and circular process, whereby theoretical assumptions are put to the test, but history demonstrates that the inductive and deductive approaches have largely been followed by different groups of stratigraphers with different objectives. Further, these stratigraphers have tended to work in isolation from each other.

According to Hallam, "geologists tend to be staunchly empirical in their approach", but are also inveterate model builders, attempting to explain their universe by developing deductive models. Two contrasting case studies illustrate empirical and model-based approaches to dating and correlation. A synthesis by Callomon (1995) of Jurassic ammonite biostratigraphy, based on a century of data collection, and the inductive building of a biozone scheme, reveals numerous gaps and considerable local stratigraphic variability in the studied sections in southern England. By contrast, a comparison by Gale at al. (2002) of two sections in India and France using a sequence model for correlations was interpreted by them in terms of global uniformity of sequence-generating processes and eustatic sea-level control.

Modern dating methods should be rigorously empirical, including the cross-correlation of multivariate dating techniques and the use of non-events as boundary markers ("golden spike" concept). Extreme caution needs to be employed in introducing such deductive concepts as "global cycles," "event stratigraphy" and "cyclostratigraphy" into methods of high-resolution chronostratigraphy. Currently, cyclostratigraphers have established the Milankovitch model of orbital forcing as the centerpiece of a research program to document climate change and to provide a basis for a high-resolution time scale. There are at least three problems with this approach: 1) Researchers downplay the probability that orbital frequencies may have differed in the geological past. 2) There is a tendency to make assumptions about stratigraphic completeness and constancy of sedimentation rate that may not be valid. 3) Independent chronostratigraphic calibration of cyclostratigraphic data is insufficiently precise, and cannot at present provide adequate constraints on cyclostratigraphic models based on tuning, filtering, and other statistical techniques.

Earth-Science Reviews 54 (2001). 321–348

SEQUENCE STRATIGRAPHY AS A SCIENTIFIC ENTERPRISE: THE EVOLUTION AND PERSISTENCE OF CONFLICTING PARADIGMS

Andrew D. Miall *Department of Geology, University of Toronto*
Charlene E. Miall *Department of Sociology, McMaster University*

Abstract: In the 1970s, seismic stratigraphy represented a new paradigm in geological thought. The development of new techniques for analyzing seismic-reflection data constituted a crisis, as conceptualized by T.S. Kuhn, and stimulated a revolution in stratigraphy. We analyze here a specific subset of the new ideas, that pertaining to the concept of global-eustasy and the global cycle chart published by Vail et al. (Vail, P.R., Mitchum, R.M., Jr., Todd, R.G., Widmier, J.M., Thompson, S., III, Sangree, J.B., Bubb, J.N., Hatlelid, W.G., 1977. Seismic stratigraphy and global changes of sea-level. In: Payton, C.E. et al., Seismic Stratigraphy—Applications to Hydrocarbon Exploration, Am. Assoc. Pet. Geol. Mem. 26, pp. 49–212.) The global-eustasy model posed two challenges to the "normal science" of stratigraphy then underway: 1. that sequence stratigraphy, as exemplified by the global cycle chart, constitutes a superior standard of geologic time to that assembled from conventional chronostratigraphic evidence, and 2. that stratigraphic processes are dominated by the effects of eustasy, to the exclusion of other allogenic mechanisms, including tectonism.

While many stratigraphers now doubt the universal validity of the model of global-eustasy, what we term the *global-eustasy paradigm*, a group of sequence researchers led by Vail still adheres to it, and the two conceptual approaches have evolved into two conflicting paradigms. Those who assert that there are multiple processes generating stratigraphic sequences, possibly including eustatic processes, are adherents of what we term the *complexity paradigm*. Followers of this paradigm argue that tests of the global cycle chart amount to little more than circular reasoning. A new body of work documenting the European sequence record was published in 1998 by de Graciansky et al. These workers largely follow the global-eustasy paradigm. Citation and textual analysis of this work indicates that they have not responded to any of the scientific problems identified by the opposing group. These researchers have developed their own descriptive and interpretive language that is largely self-referential.

Through the use of philosophical and sociological assumptions about the nature of human activity, and in particular the work of Thomas Kuhn, we have attempted to illustrate 1. how the preconceptions of geologists shape their observations in nature; 2. how the working environment can contribute to the consensus that develops around a theoretical approach with a concomitant disregard for anomalous data that may arise; 3. how a theoretical argument can be accepted by the geological community in the absence of proofs such as documentation and primary data; 4 how the definition of a situation and the use or non-use of geological language can direct geological interpretive processes in one direction or another; and 5 how citation patterns and clusters of interrelated invisible colleges of geologists can extend or thwart the advancement of geological knowledge.

ATTACHMENT 5 Background Reading (Agenda Item 19)

RESOLUTION OF THE NORTH AMERICAN COMMISSION ON STRATIGRAPHIC NOMENCLATURE
Approved by Unanimous Vote of the Commission, October 8, 2009

WHEREAS, the purposes of the North American Commission on Stratigraphic Nomenclature (NACSN) are to develop statements of stratigraphic principles, to recommend procedures applicable to classification and nomenclature of stratigraphic and related units, to review problems in classifying and naming stratigraphic and related units, and to formulate expressions of judgment thereon; and,

WHEREAS, the promotion of unambiguous communication in stratigraphy and geoscience is an explicit goal of NACSN; and,

WHEREAS, NACSN includes representation from the American Association of Petroleum Geologists (AAPG), the Association of American State Geologists (AASG), the Geological Society of America (GSA), the United States Geological Survey (USGS), the Geological Survey of Canada (GSC), the Canadian Society of Petroleum Geologists (CSPG), the Geological Association of Canada, the Instituto de Geologia de la Universidad Nacional Autonoma de Mexico, the Society for Sedimentary Geology (SEPM), the Asociación Mexicana de Geologos Petroleros, the Sociedad Geológica de Mexico, and the Servicio Geológico Mexicano, as well as Commissioners-at-Large representing various sectors of the geological and stratigraphic community; and,

WHEREAS, Article 13(c) of the North American Stratigraphic Code (Code) (1983, 2005) states that:

"The age of a stratigraphic unit or the time of a geologic event, as commonly determined by numerical dating or by reference to a calibrated time-scale, may be expressed in years before the present. The unit of time is the modern year as presently recognized worldwide. Recommended (but not mandatory) abbreviations for such ages are SI (International System of Units) multipliers coupled with "a" for annum: ka, Ma, and Ga5 for kilo-annum (10^3 years), Mega-annum (10^6 years), and Giga-annum (10^9 years), respectively. Use of these terms after the age value follows the convention established in the field of C-14 dating. The "present" refers to 1950 AD, and such qualifiers as "ago" or "before the present" are omitted after the value because measurement of the duration from the present to the past is implicit in the designation. In contrast, the duration of a remote interval of geologic time, as a number of years, should not be expressed by the same symbols. Abbreviations for numbers of years, without reference to the present, are informal (e.g., y or yr for years; my, m.y., or m.yr. for millions of years; and so forth, as preference dictates). For example, boundaries of the Late Cretaceous Epoch currently are calibrated at 63 Ma and 96 Ma, but the interval of time represented by this epoch is 33 m.y."; and,

WHEREAS, the concept of a specific point in time (datum) is distinct from the concept of duration; and the use of the abbreviations ka, Ma, and Ga for specific points in time before the present has been advocated not only by the Code, but also by the International Stratigraphic Guide (1994) and the Glossary of Geology (1987, 1997, 2005); and,

WHEREAS, the terms year, annum, or annus are not part of the International System of Units (SI); and,

WHEREAS, no petition has come to NACSN since the 1983 publication of the Code suggesting changes to Article 13(c) regarding the above stated usage of abbreviations for dates and durations; and,

WHEREAS, the recent papers of Aubry (2009) and Aubry et al. (2009) (papers attached) have comprehensively reviewed the issues associated with dates and durations in geoscience and have made appropriate recommendations consistent with the Code, Guide, and Glossary; and,

WHEREAS, it is the position of NACSN that the use of Ga, Ma, ka for points in time before the present, together with suitable abbreviations (e.g., Gyr, Myr, kyr, yr as recommended by Aubry et al. (2009)) for durations is appropriate and should be allowed.

NOW, THEREFORE, BE IT RESOLVED, that NACSN advocates that the abbreviations Ga, Ma, and ka should be used exclusively to express the age of stratigraphic units or points in time before the present (i.e., years ago); that durations be designated by appropriate abbreviations (e.g., Gyr, Myr, kyr, yr as recommended by Aubry et al. (2009)); that the editorial policies of geoscience journals and publications allow for this usage; and that the recommendations of Aubry et al. (2009) in these matters should be given due consideration for more formal adoption in appropriate venues.

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