The SEDIMENTARY Record

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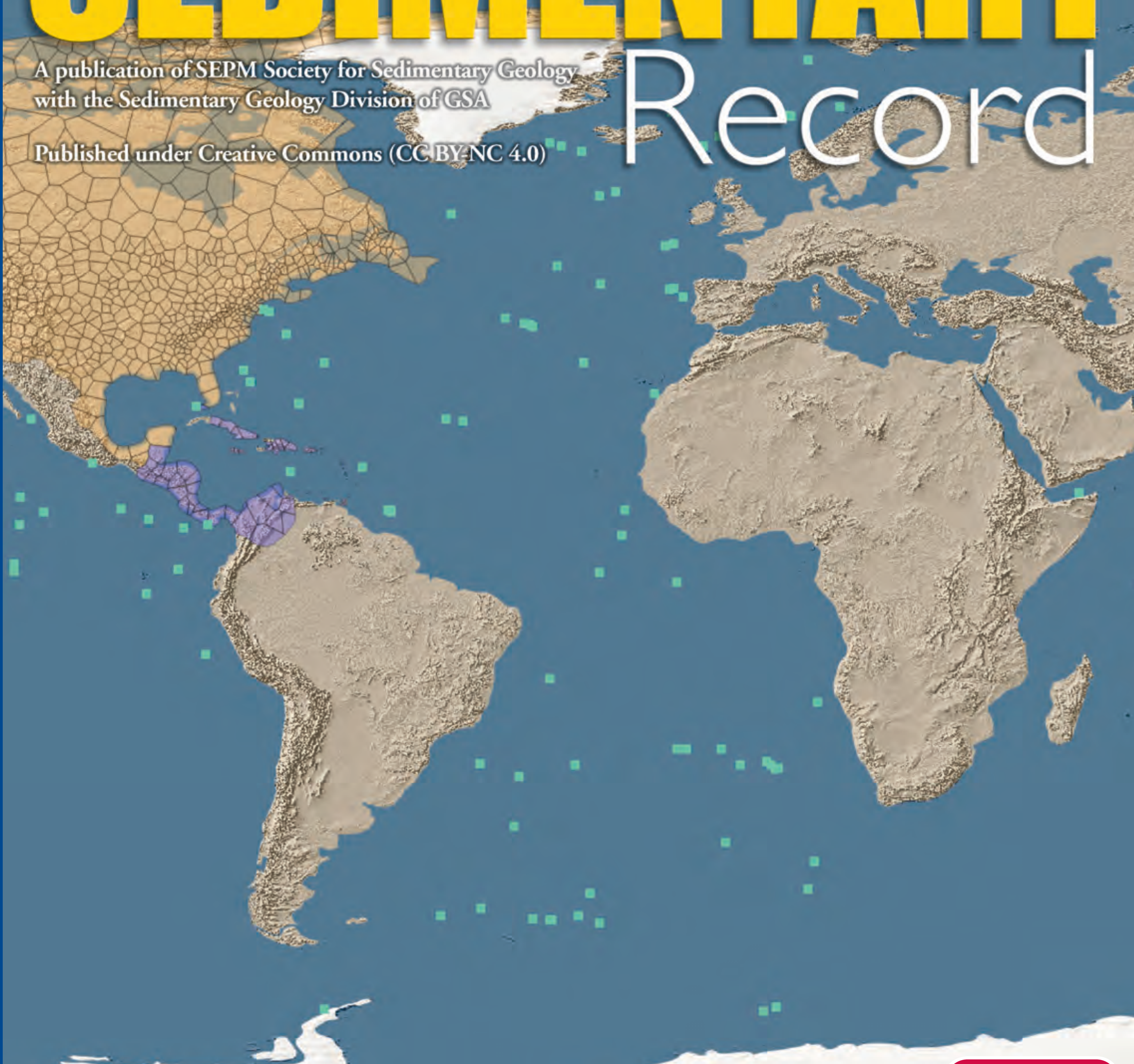

INSIDE: WE NEED A GLOBAL COMPREHENSIVE STRATIGRAPHIC DATABASE: HERE'S A START

PLUS: PRESIDENT'S COMMENTS, EDITORIAL, 2017-18 FALL BALLOT RESULTS, SGD NEWS, SEPM ACTIVITIES AT 2018 ACE

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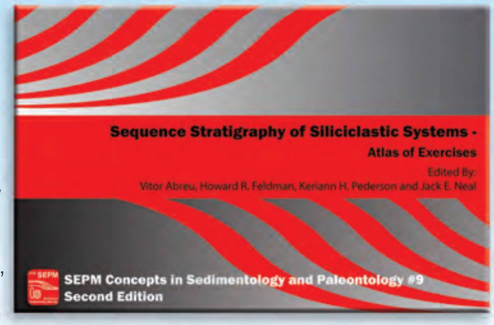
Concepts in Sedimentology and Paleontology 9 (2nd edition)

Sequence Stratigraphy of Siliciclastic Systems

Edited by: Vitor Abreu, Howard R. Feldman, Keriann H. Pederson, and Jack E. Neal



This publication is the result of more than 3 decades of sequence stratigraphy research and application. The objective is to emphasize the most important aspects of Sequence Stratigraphy—a method to guide geologic interpretation of stratigraphic data (seismic profiles, well-logs, cores and outcrops) across scales (from local to regional and global) and depositional environments (from continental to deep marine).The stratigraphic concept of a depositional sequence was introduced to the scientific literature by Peter Vail and his colleagues in the late 70s, building on the shoulders of giants like Chamberlain, Sloss and Wheeler. Since then, several papers compared and contrasted the original sequence-stratigraphic school published in the AAPG Memoir 26 in 1977 with other approaches to subdivide the geologic record, as well as, debating the model validity and impact on the community. At its core, the "model" is really a stratigraphic interpretation method, which was never explicitly documented in the literature. The objective of this book is to present the sequence stratigraphic method in its current form in an attempt to clarify its usage and application in diverse geologic data and depositional environments. This publication is the result of more than 3 decades of sequence stratigraphy research and application. The objective is to emphasize the most important aspects of Sequence Stratigraphy—a method to guide geologic interpretation of stratigraphic data (seismic profiles, well-logs, cores and outcrops) across scales (from local to regional and global) and depositional environments (from continental to deep marine). This book in an 11 x 17 format is designed to be easily used for teaching or self-learning experiences. In the second edition of the "Atlas", the book was divided in 2 separately bound volumes—Exercises and Solutions—to make it easier to use the publication as text book for sequence stratigraphy courses in universities. Also, a new exercise was added and several of the existing exercises went through major updating and editing.

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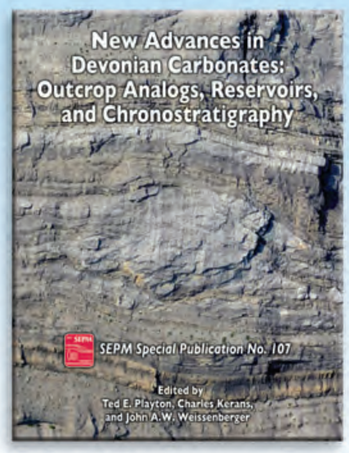

Special Publication #107

New Advances in Devonian Carbonates: Outcrop Analogs, Reservoirs, and Chronostratigraphy

Edited by: Ted E. Playton, Charles Kerans, and John A.W. Weissenberger

The Devonian stratigraphic record contains a wealth of information that highlights the response of carbonate platforms to both global and local phenomena that drive carbonate architecture and productivity. Signals embedded in the Middle-Upper Devonian carbonate record related to biotic crises and stressed oceanic conditions, long-term accommodation trends, and peak greenhouse to transitional climatic changes are observed in multiple localities around the world. Devonian datasets also show the importance of local and regional phenomena, such as bolide impacts, the effects of terrestrial input and paleogeography, syn-depositional tectonics, and high-frequency accommodation drivers. These add complexity to the carbonate stratigraphic record when superimposed on global trends. The unique occurrence of well-studied and pristinely preserved reefal carbonate outcrop and subsurface datasets, ranging across the globe from Australia to Canada, allows for a detailed examination of Devonian carbonate systems from a global perspective and the opportunity to develop well-constrained predictive relationships and conceptual models. Advances in the understanding of the Devonian carbonate system is advantageous considering, not only the classic conventional reservoirs such as the pinnacle reefs of the Alberta Basin, but also emerging conventional reservoirs in Eurasia, and many unconventional plays in North America. The papers in this volume provide updated stratigraphic frameworks for classic Devonian datasets using integrated correlation approaches; new or synthesized frameworks for less studied basins, reservoirs, or areas; and discussions on the complex interplay of extrinsic and intrinsic controls that drive carbonate architectures, productivity, and distribution. The 13 papers in this special publication include outcrop and subsurface studies of Middle to Upper Devonian carbonates of western Canada, the Lennard Shelf of the Canning Basin, Western Australia, and the western USA.

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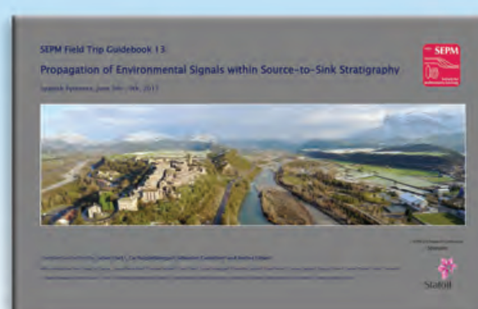
SEPM Field Trip Guidebook #13

Propagation of Environmental Signals within Source-to-Sink Stratigraphy

By: Julian Clark, Cai Puigdefàbregas, Sébastien Castelltort and Andrea Fildani



This guidebook was compiled for the field trip excursions of the SEPM Research Conference on the *Propagation of Environmental Signals within Source-to-Sink Stratigraphy*, (June 4th-10th, 2017). The world-class outcrop exposures and localities visited enabled the investigation of correlative stratigraphy from alluvial, fluvial, shallow marine, slope and deep marine environments with the direct observations of different segments of sediment routing systems. Decades of research in the region have contributed to our understanding of the basin-filling stratigraphic response to orogenic evolution and climatic events. These geologic insights and the well-preserved exposures have made the region a classic locality for both academic and industry-related geologic training, and a natural laboratory for continued research.

This SEPM Field Trip Guidebook presents key outcrops visited during the conference within a source-to-sink framework. The geologic map published herein is a cornerstone of this contribution, enabling and revising stratigraphic correlations required for this approach. An overview of source-to-sink concepts, methods and tools that can be applied to the stratigraphic record is provided, together with new data and analysis demonstrating environmental signals at different scales within the basin.

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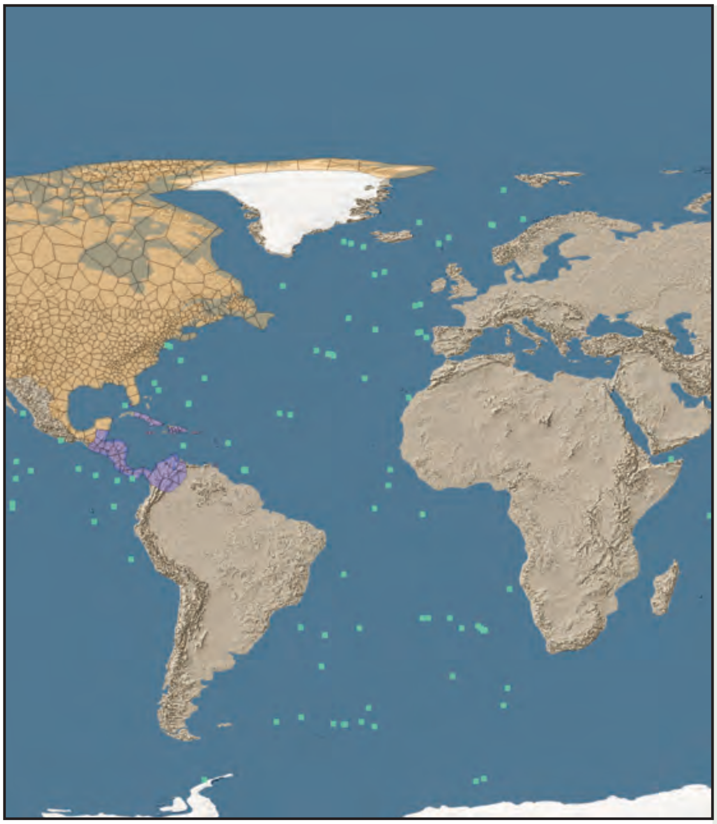

Cover image: Distribution of Macrostrat columns.

Editors

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We need a global comprehensive stratigraphic database: here's a start

Shanan E. Peters and Jon M. Husson
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Major transitions in the abundance, diversity, and composition of life on Earth are readily detected by a survey of a coarsely-resolved stratigraphic fossil record. However, calibrating the magnitude and impacts of biological diversification, mass extinctions, and key biological transitions requires a discipline-wide, multi-scale and hierarchical approach. Finding and describing new fossils and refining biological systematics are foundational to paleontology, but synthesizing temporally-, geographically-, and taxonomically-resolved fossil occurrences from around the globe is also required to address many paleobiological problems, such as the trajectory of global biodiversity (Alroy et al., 2008). Multiple scales of data collection and analysis are necessary because without field- and specimen-based work we would have no basis to interrogate life history and because macroevolutionary processes cannot be understood simply by scaling-up processes observed within individual populations or species (Jablonski, 2017).

Sedimentary geology is, in many respects, similar. Understanding sediment transport and depositional processes, the mechanisms that govern stratal geometries and the formation of basin fill successions, and then applying that understanding to the characterization and correlation of sedimentary successions, is essential. However, global-scale processes and events can propagate downward to affect the behavior of individual sedimentary systems, and the processes that govern the formation and destruction of the global sedimentary rock record cannot be revealed by scaling-up basin-scale mechanisms. Instead, synthesizing temporally-, geographically, and sedimentologically-resolved stratigraphic data from across continents and then quantitatively interrogating those data are required in order to fully characterize the large-scale sedimentary record and to understanding processes governing long-term sedimentary processes. Here we summarize some basic results from one attempt to synthesize stratigraphic data in this capacity and then make a case for why building a globally comprehensive stratigraphic database is a worthy disciplinary priority.

MACROSTRAT DATABASE

Just as “macroevolutionary” research involves the analysis of multiple lineages and the interrogation of evolutionary processes operating above the species-level, “macrostratigraphy” involves the analysis of multiple stratigraphic successions and the interrogation of processes operating at or above the level of individual sedimentary basins (Peters 2006; Hannisdal and Peters, 2010; Aswaserleet et al., 2013). Macrostratigraphy is not a different approach to stratigraphy; it is an approach to systematizing and analyzing stratigraphic data and quantitatively summarizing spatial and temporal patterns in the rock record.

Macrostrat, a relational geospatial database designed to facilitate quantitative analyses of the upper crust, contains general, but also comprehensive, chronostratigraphic summaries of 34,931 lithologically and temporally-resolved surface and subsurface geological rock units distributed across 1,342 regions covering 26.7 million km2 in North and South America, the Caribbean, New Zealand and from 132 offshore drilling sites (Fig. 1). Rock units in each column are linked to general lithology descriptions and lithostratigraphic nomenclatural hierarchies. In addition, many units are linked to field- and sample-derived data, including fossil occurrences in the Paleobiology Database and more than 180,000 geochemical and outcrop-derived measurements from multiple sources (Peters et al., 2018). Because Macrostrat columns characterize the chronostratigraphic distribution of rock bodies, not their physical contact relationships (e.g., a dike in a Macrostrat column is referenced to its temporal position, not its physical contacts), we have also integrated more than 2.2 million bedrock map polygons from over 180 different geological map sources, thereby providing constraints on 2D surface expression and laying the groundwork for physical 3D modeling. Field-based descriptions of units associated with map publications augment Macrostrat unit properties and, reciprocally, Macrostrat units matched to map units can improve age constraints (https://macrostrat.org/map). Most Macrostrat data are accessible via an Application Programming Interface (API: https://macrostrat.org/api), which is used by a variety of third-

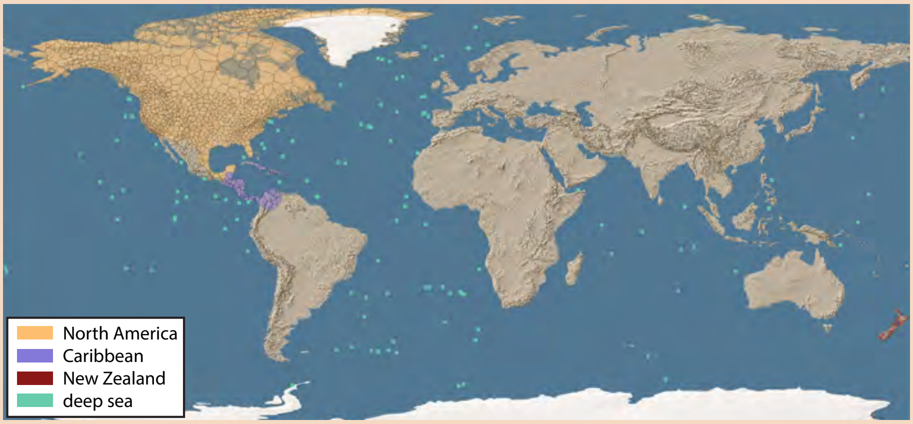

Figure 1: Distribution of Macrostrat columns.

party mobile applications, including Rockd, a Macrostrat team product, and Flyover Country, built by an independent collaborative group. The API serves as the basis for the results presented here.

SURVIVING ROCK QUANTITY

How much sedimentary rock is on Earth and what is its distribution through space, lithology, environment, and time? This is a fundamental question that Earth scientists should be able to answer in a principled way. Some general expectations are reflected in the prevalent view of rock cycling, traceable all the way back to Hutton's "sedimentary cycle" and Darwin's "tattered manuscript" metaphor for the geologic record. If, in adhering to this view, we assume that the formation and destruction of sediments is a continuous random process, then a basic prediction is that the strongest signal in the surviving sedimentary record should be one of continual destruction. Degradation of this type would be expressed as exponential decline in sediment quantity with increasing age (Gregor, 1970; Blatt and Jones, 1975). If we further assume that rates of formation and destruction of sediments are equal and stochastically constant, then the prediction is that the total mass of sediment is invariant over time, with only a small and constant mass fraction cycling through the surface environment (Garrels and Mackenzie, 1979; Mackenzie and Pigott, 1981). Bob Berner used this type of steady-state model of the sedimentary record to characterize the carbon and sulfur cycles and, in turn, produce one of the first models of atmospheric pO_2 across Phanerozoic time (Berner and Canfield, 1989). Because the total mass of sedimentary rock does not change in this conceptualization, shifts in the composition of the sedimentary reservoir (i.e., changing proportion of carbonates vs. shales) were invoked to vary the total amount of reduced phases (namely, organic carbon and pyrite) buried per unit time, which in turn drove a time-varying geologic flux of oxygen into and out of the surface environment.

Most work in studying Earth's surface history has since moved to isotope-based methods of constraining organic carbon and pyrite fluxes (Des Marais et al., 1992; Canfield and Teske, 1996), as well as more theoretically-based models of atmospheric O_2 (Bergman et al., 2004; Goldblatt et al., 2006; Laakso and Schrag, 2014). A Huttonian view of the sedimentary cycle, however, is still widely held and this view affects how geologic records are interpreted. The total surviving amount of sediment in the North American and Caribbean (NAC) regions covered by Macrostrat (Fig. 1) does not, however, exhibit the expected exponential decline with increasing age (Fig. 2). Instead, we observe two separate states in sediment quantity, one during the Precambrian and one during the Phanerozoic, each of which differs dramatically in mean but exhibits no prominent long-term trends. Superimposed on these two states are fluctuations that, at least during the Phanerozoic, closely correspond to Sloss's (Sloss, 1963)

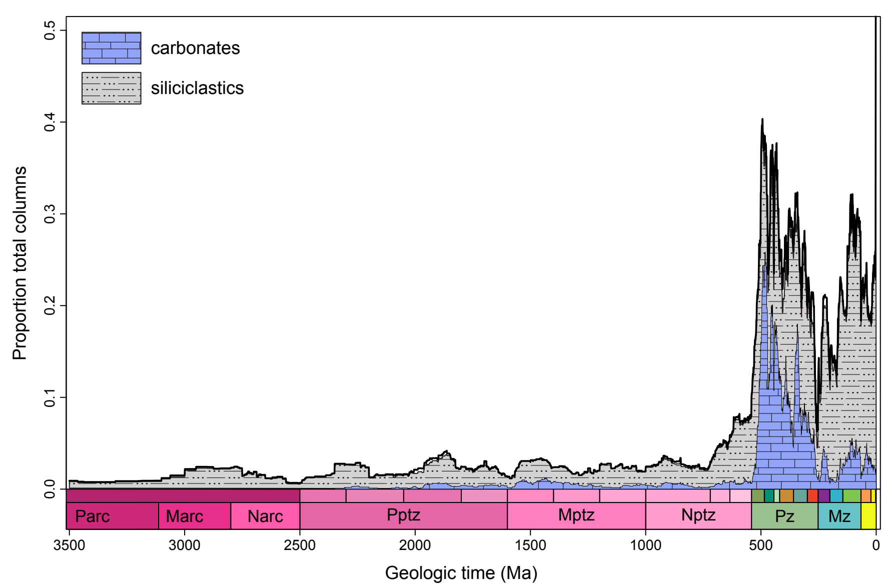

Figure 2: Total sedimentary rock quantity in the North America-Caribbean region. Quantity is measured as proportion of 1,013 columns in this area that contain sedimentary and/or metasedimentary units. Units are weighted by the proportion of the unit that is sedimentary (e.g., a unit composed of 50% basalt and 50% volcaniclastic sediment would contribute 0.5/1,013 over its duration).

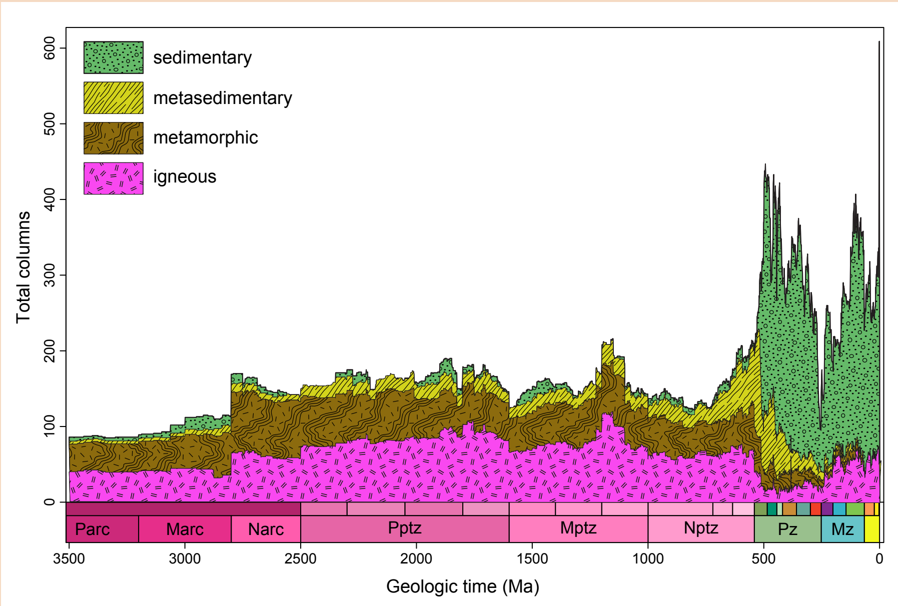

Figure 3: Total rock quantity, measured as in Fig. 2 for all rock types.

"tectonostratigraphic" units and the supercontinent cycle (Meyers and Peters; Zaffos et al., 2017). Several shorter-term fluctuations in are also evidenced, including a large drop in quantity corresponding in time to the sea level fall during the late Ordovician glaciation (Finnegan et al., 2012).

The results in Fig. 2 provide prima facie evidence for the hypothesis that the traditional erosion-dominate view of sedimentary cycling is not the primary process signal in the surviving sedimentary rock record. Instead, the weight of evidence indicates that, in aggregate, the sedimentary record at this temporal and spatial scale (Fig. 1) preserves a time-varying process signal that reflects tectonic- and climate-driven changes in rates of net sediment accumulation. If we extend the analysis to include all rock types (Fig. 3), the picture remains largely the same.

Portions of the sedimentary record do strongly support the standard model of sediment cycling, however. Sediments deposited on oceanic crust are represented in Macrostrat by 132 completely- or nearly completely-cored offshore IODP, DSDP, and ODP drilling sites (Peters et al., 2013; Fraass et al., 2015). Deep sea sediments are well-described by an exponential decline (Fig. 4). Non-marine sediments, which include a geomorphologically and tectonically diverse assemblage of sediments in various stages of transport and storage on the landscape, also exhibit approximately exponential decrease in quantity with increasing age, suggesting a strong overprint of erosion in their mass-age relationship (see Peters and Husson, 2017). Interestingly, in the Phanerozoic, there is an approximately exponential increase in the number of metasedimentary rock units with increasing age (Fig. 4), suggesting that once sediments are deposited on (or are accreted to) the continent, there is a continuous random probability that they will become sufficiently modified to be described as metasedimentary (though it should be noted that there is currently no quantitative assessment of metamorphic grade for Macrostrat units and many usages of the general field term "quartzite," for example, should be replaced by "well-cemented quartz arenite").

Although erosion isn't the dominant signal in the large-scale sedimentary record (Fig. 2), some signatures of erosion are masked by the spatial resolution of Macrostrat columns. For example, epicontinental columns (Fig. 1) cover areas that are often larger than the footprint of erosional features. For example, the unambiguously erosional topography that often separates Sloss-scale sequences in the cratonic interior are not fully quantitatively captured by the data shown in Figure 2. Similarly, areas of crustal deformation in which whole crustal blocks have been rotated and truncated appear, from Macrostrat's chronostratigraphic view, to not

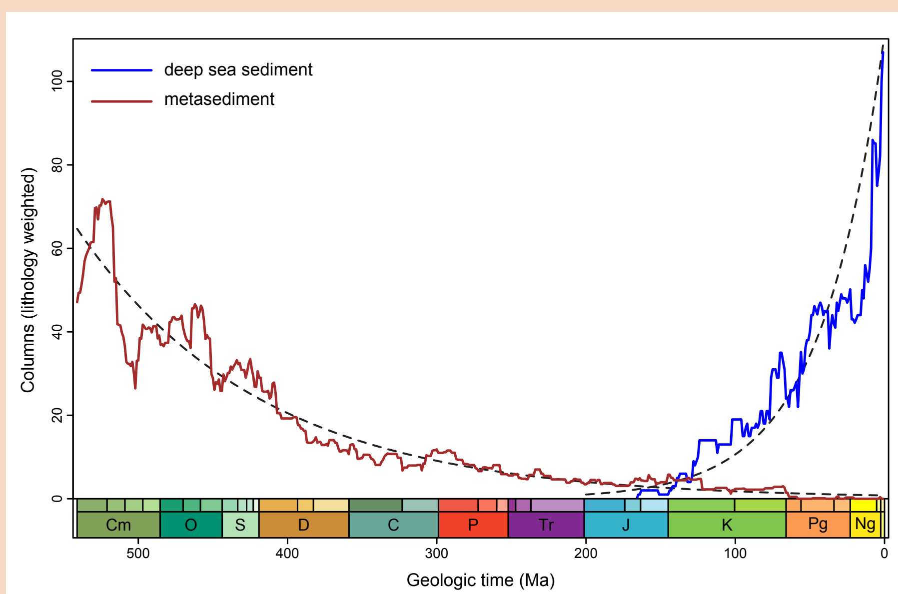

Figure 4: Total number of columns in the deep sea (on oceanic crust) that contain sediment and the total number of metasedimentary columns. Units are weighted by rock type as in Fig. 2 and 3. Dashed lines show exponential fits to the data. For metasediment, y=

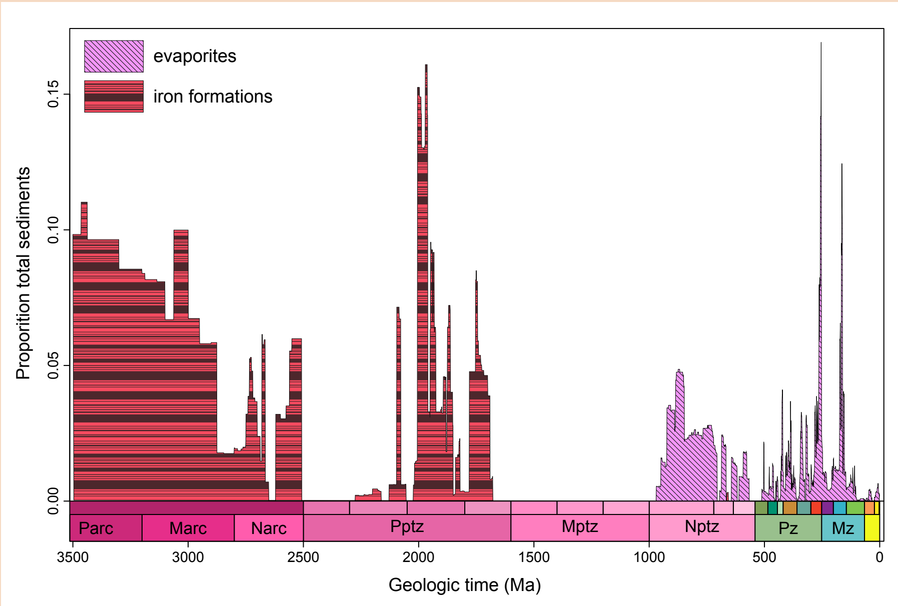

Figure 5: Abundance of evaporite- and iron formation-bearing units measured as a proportion of total sedimentary units, which varies over time as shown in Fig. 2.

have been eroded at all. For example, the Precambrian Grand Canyon Supergroup is represented "intact" in Macrostrat's chronostratigraphic view for all columns that intersect it, despite the fact that it is prominently truncated by an angular unconformity in which the entire supergroup and underlying Vishnu Schist are covered by Cambrian sediments (Karlstrom and Timmons, 2012). An analogy, then, is to view Macrostrat's scale of analysis as equivalent to the wooden frame of a building that is infested by termites. The whole sedimentary record is perforated by multiple generations of erosional processes, operating at many different scales, and that signature of erosion is evident upon close inspection. Nevertheless, the framework itself still stands, as originally constructed.

Changes in sediment accommodation and the properties of the sediments that fill it are driven by changes in the state of the Earth system, which manifest in several different ways. For example, the abundance of banded iron formations and evaporites changes markedly over time (Fig. 5). Most aspects of their age-quantity patterns in the surviving rock record are not artifacts of preservation. Instead, this pattern reflects major changes in the state of the surface environment - namely, rising levels of atmospheric O_2 and sulfate in the global ocean (e.g., Isley and Abbot, 1999; Horita et al., 2002), with shorter-term variability caused by shifts in the availability of environments suitable for evaporite formation (Halevy et al., 2012). Similarly, the "Great Unconformity," a surface of non-deposition and variable amounts of erosion separating Phanerozoic sediment from Precambrian crystalline basement rocks (and a much lesser amount of Precambrian sediment), is not easily accounted for, accept by invoking a large increase in net sediment accumulation on the continents (Peters and Gaines, 2012; Husson and Peters, 2017). Whether or not the large increase in net sedimentation across the Great Unconformity was accentuated or driven by a period of prolonged continental denudation during the late Precambrian, remains to be tested.

IMPLICATIONS AND UTILITY

Major features in the history of life and atmospheric oxygen are mirrored by a simple quantitative description of the timing and magnitude of changes in the total amount of surviving sediment vs. age (Fig. 2). This is true over the past 3.5 billion years (Husson and Peters, 2017) and within the confines of the Phanerozoic, when the temporal pattern of sedimentation

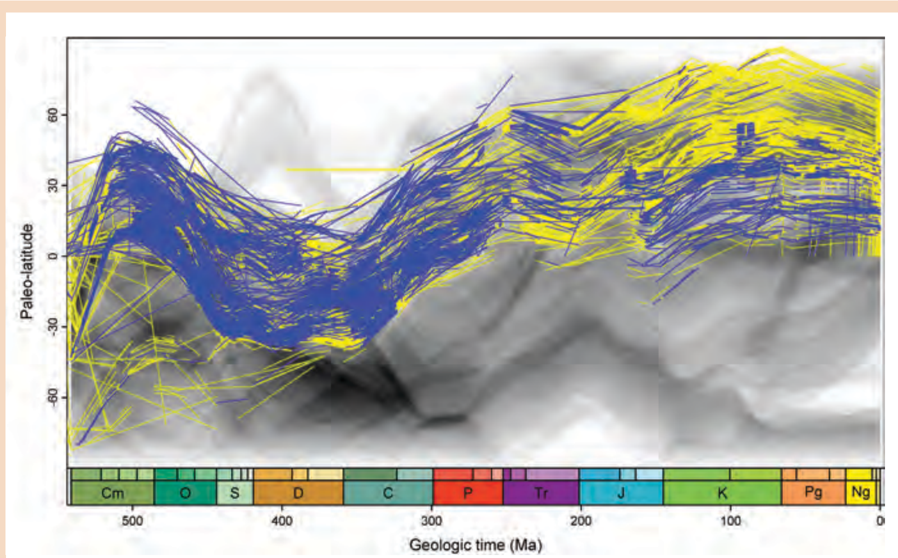

Figure 6: Paleolatitude vs. time in the Phanerozoic. Yellow and blue lines show paleolatitude and ages of all sedimentary units (yellow) and carbonate-bearing units (blue). Lines that slope indicate latitudinal range of start and end of deposition of unit according to the age model. Background grayscale indicates the global latitudinal distribution of continents over time from the EarthByte model. Darker gray indicates more area at that latitude; white indicates latitudes with no continental blocks.

and shifting lithological composition predicts major features in the macroevolutionary history of marine animals (Foote, 2003; Peters 2005, 2008, but see Smith, 2001; Smith and McGowan, 2007). Elsewhere we make the case that similarities between the sedimentary record (Fig. 2) and biological and geochemical proxy records for atmospheric oxygen concentration are more than coincidental (Husson and Peters, 2017). The sedimentary record isn't likely to be a passive and incomplete recorder of the history of atmospheric oxygenation; rather, its unsteady growth was the proximate driver.

Regardless of whether or not one finds the patterns derived from Macrostrat-scale analyses compelling from an Earth system process point of view, the database has wide utility. As a digitally-accessible source of information about the spatial, temporal, and lithological properties of rocks in the surface and subsurface, the database and software application ecosystem growing around it can be used for planning field trips, teaching, informatics initiatives, assessing the geological distribution of samples, or just basic question-answering about the geologic record ("where can I go to see Cambrian glauconitic sandstone?"). Perhaps more importantly, a large amount of proxy data have been extracted from the rock record and some of those data are managed independently of any quantitative understanding of it. This is done partly out of a need for expediency on the part of the data compilers and partly because the geologic record is typically viewed as an undesirable filter that must be worked around, not leveraged as a process signal in its own right.

A comprehensive, geospatially-informed characterization of the upper crust is a natural informatics framework for everything from assessing potential stratigraphic overprints on fossil data (Holland, 2016), to characterizing the distribution and properties of groundwater (Gleeson et al., 2016) and energy resources. A characterization of the space-time-lithology properties of the upper crust might also hold the key to understand how Earth systems are integrated and how they have combined to drive the long-term evolution of the Earth and life.

GOING GLOBAL

An obvious criticism of Macrostrat in its present form is that any results deriving from it are unique to the geographic area that it covers and therefore not a globally-relevant signal. This is a valid criticism, but it also articulates a hypothesis that has been preliminarily tested, most substantively by Alexander Ronov and colleagues (Ronov et al. 1980; Ronov 1994). Ronov's tabulation of rock quantity and type is coarse in geographical and temporal resolution, but it is also global in scope (excluding Antarctica). Ronov used his global compilation of rock quantity and age to perform an initial test of the standard model of the sedimentary cycle, which he rejected. Ronov et al. (1980) also concluded that global trends in sediment quantity were evidenced on continental crustal blocks, despite some regional differences.

Our results and comparisons to global data (and biological and geochemical proxy records) leads us to the same conclusions. Macrostrat reproduces total global sedimentary reservoir size, as estimated by Ronov, as well as other major features of his global tabulation, even when North America is removed from Ronov's data (Peters and Husson, 2017). Quantitative comparison is restricted to the Phanerozoic, however, and does not obviate our need for a global dataset. Climate-sensitive sediments, including carbonate, for example, are likely to be influenced by the particulars of paleogeographic and tectonic history of the sampled region. The paleolatitude of Phanerozoic Macrostrat sediments in NAC, superimposed on the global paleolatitudinal distribution of continental area from the EarthByte paleogeographic model (Wright et al, 2013) is shown in Fig. 6. As Laurentia was assembled into North America during the Phanerozoic, there has been a net northward-drift in the position of the continent. Carbonates tend to be most abundant at low latitudes, and the passage of North America from lower to higher latitudes during the Phanerozoic is, at least in part, reflected by the abundance of carbonate through time in this region (Fig. 2). Other factors driving a long-term decline in carbonate abundance on the continents include a decline in overall average continental flooding and the evolution of pelagic calcifying protists during the Triassic (Wilkinson and Walker, 1989; Bown et al., 2004). North America is not a random sample of the crust with respect to paleolatitude, and this impacts our ability to make predictions about the nature of the global sedimentary record.

A PATH FORWARD

The Macrostrat team, supported in part by the USGS, ACS, NSF, and UW-Madison Dept. of Geoscience, has invested in building a data and informatics foundation that is capable of facilitating rapid geographic expansion. We are continuing the process of compiling regional map and column data second hand, but there is a better way forward. The basic information required to construct Macrostrat columns can be viewed as a general rock-time scaffolding that could, at least in some cases, be efficiently constructed by geoscientists with regionally-comprehensive geological knowledge and expertise. Like all scaffoldings, the initial framework would only be expected to provide a general picture of the eventual edifice to be completed. However, harnessing regional geological expertise and rapidly creating a comprehensive space-time-rock scaffolding that describes, in even a basic capacity, the known rock record globally would have many positive impacts. No measured section, annotated thin section, geochemical measurement, fossil, or any other information extracted from the rock record, would find itself orphaned and could immediately contribute to a growing quantitative body of knowledge on the upper crust. Such a data resource would be a valuable addition to the disciplinary scope of sedimentary geology.

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PRESIDENT'S COMMENTS

How to maintain an active and lively member community has been a major theme for this Council. Declining membership numbers in SEPM, as well as in other geologic societies, have motivated us to find solutions for the future that can bring more benefits to our members. Moreover, in recognizing that we are not alone, we are establishing a joint committee between SEPM and IAS to analyze trends and issues specific to the sedimentological community and to find common solutions. We are also looking forward to SEPM's greater involvement and partnership with IAS at the International Sedimentological Congress this August in Quebec.

The SEPM Council has been busy discussing and planning a set of important initiatives, to ensure that the community keeps active and engaged. We think that key areas include placing an emphasis on finding new ways to make SEPM more attractive to students and young professionals, to gain a higher international profile by engaging the larger community, and to offer bridges and improved connections to other geoscience Societies. We are finalizing plans to hold Field School Programs for Young professionals, co-taught by academics and industry. The first School is being planned to take place in the Alps and will be organized by myself, Rick Sarg and Kristin Bergmann. More details on this will be out soon. Council plans to expand on the involvement of international members by engaging specific world regions into organizing Field Trips, which will be supported by SEPM. This program is also being finalized and details will also be out soon. Thirdly, we are in the process of renewing our MOU with AGU, to enhance the participation and visibility of the SEPM community at the annual AGU meeting.

Planning for the longer term is important for our Society and for this purpose SEPM holds strategic planning meetings at regular intervals. The last SEPM strategic planning session was held in May of 2014. Currently, we are planning to hold the next strategic planning meeting in August 2018. Typical topics for discussions include SEPM Finances, Membership, Governance, Journals and Communicating the Science, Social Media and Partnering with other Societies. A call for your thoughts and ideas for topics to be addressed at the meeting will be out soon and we encourage all members to actively suggest topics for discussion.

As this is my last column before turning over the gavel to in-coming president Gary Nichols, I would like to thank all the amazing staff at Headquarters, headed by Executive Director Howard Harper, and Associate Director/Business Manager Theresa Scott, together with the very dynamic members of the SEPM Council and Headquarters Business Committee (HBC) for their work over the course of my Presidency. It has been a very productive year, which I hope has set in motion a number of activities that will keep the SEPM community active and lively in the future.

As I move into my role as Past-President, I will continue the dialog with other geoscientific Societies where sedimentary geology is not sufficiently visible and work towards implementing various collaborations that will be mutually beneficial and provide a broader exposure for the SEPM community. The year has gone by very fast but it has been always a pleasure to work with the SEPM community. It has been a most enjoyable and enriching experience for me, and I know that the Society will be in good hands with my successor Gary Nichols.

Please don't forget to sign up for the SEPM Business Luncheon at the upcoming annual meeting in Salt Lake City and of course attend the SEPM President's Reception and Awards Ceremony, both on Tuesday, May 22nd. They both are a great opportunity to catch up with friends and colleagues, to hear the latest news on SEPM activities, and to enjoy a presentation by the invited speaker, Marjorie Chan. Looking forward to seeing you in Salt Lake City.

Maria Mutti, SEPM President

EDITORIAL

Dear Sedimentary Geology colleagues,

I'm pleased to assume duties as the new Editor of the Sedimentary Record for the 2018 – 2021 term. I am currently an Assistant Professor at University of Utah in the Geology and Geophysics Department. I specialize in sedimentology, stratigraphy, and geochemistry, with an emphasis on offshore mudstone-dominated systems as well as shallow marine, fluvial and lacustrine environments. Additionally, I am serving as Technical Program Chair for the AAPG ACE 2018 Annual Meeting in Salt Lake City.

It is my aim to ensure that the Sedimentary Record thrives over the next three years. My goal is to provide ample lead time for article submission so rigorous peer review can be carried out and article quality is high. I would encourage you to contact me to connect me with authors with great ideas in the broad discipline. I also aim to make the article publication process more transparent, setting up an online system for authors to submit articles for publication to the Sedimentary Record, with additional detailed information about content and formatting requirements. One of the ancillary aims of Sedimentary Record is to generate discussion in the Sedimentary Geology community about critical topical issues. After all, thoughtful discussion among colleagues helps to foster a healthy community of collaboration and innovation. We are discussing a variety of ways that SEPM and/or the Sedimentary Record may host discussions that may follow from a published article of interest. If you have any questions, concerns, or ideas, along with some energy to take on some extra tasks to help move the Sedimentary Record in a positive direction, please feel free to contact me.

Regards,

Lauren Birgenheier, Ph.D.
lauren.birgenheier@utah.edu
Editor of The Sedimentary Record

2017-18 FALL BALLOT RESULTS

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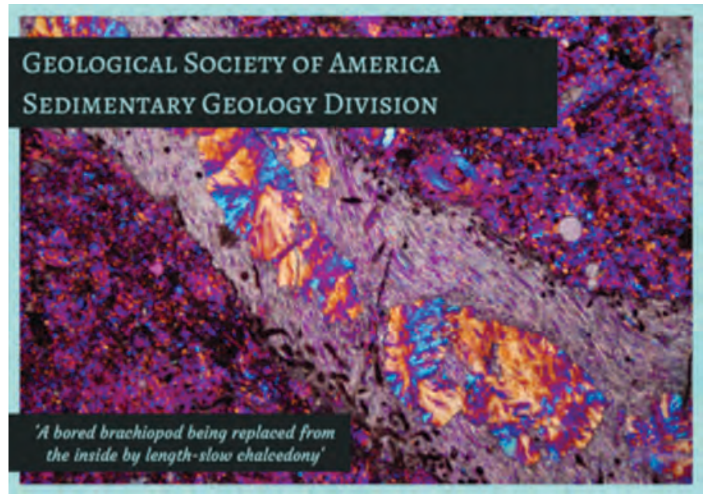
Spring 2018 Newsletter

Sedimentary salivations for 2018, the year of the very happy Dog! In this issue find out about some of the 2017 accomplishments of GSA's Sedimentary Geology Division (SGD) and what's coming up in 2018 and beyond. Our membership in the division remains strong but our numbers are down a bit from last year (1736 in 2016 and 1478 in 2017) – so be sure to renew your GSA membership AND your Sedimentary Geology Division dues. Remind your colleagues to do the same. Help us make this division and GSA a part of your professional hub of activities- pass along your ideas to the division officers or better yet ***Get Involved!***

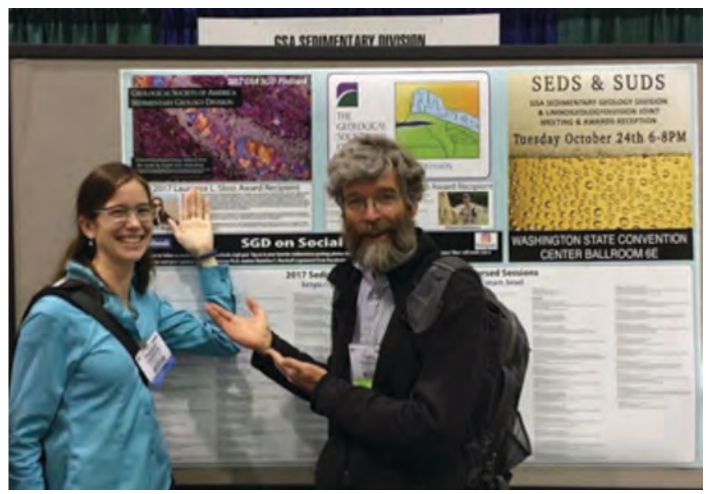
2017 GSA Annual Meeting in Seattle, Washington Recap

The SGD had an excellent turnout at our many sponsored events at the 2017 Annual GSA Meeting in Seattle, Washington. The SGD sponsored a whopping 104 topical sessions covering a very diverse spectrum of sedimentary-related science. The SEPM/SGD sponsored student poster session **"T84. The Dynamics of Stratigraphy and Sedimentation (Posters)"** featured 46 student poster presenters. The posters were judged for scientific and presentation quality and the top 4 winners were honored at the SGD Awards Ceremony. (see page 2)

2017 SGD Postcard



There is nothing boring about this year's SGD feature postcard (–well almost nothing) entitled "A bored brachiopod being replaced by length-slow chalcedony"



This year's post card image was submitted by Sedimentary Geology Division member and Ph.D. student **Madeline S.Marshall** (left), here being honored by the new SGD Chair, **Gary Gianniny** (right) at our booth in Seattle. The card garnered much attention and intrigued many as they were handed out at the GSA booth and at SGD sponsored sessions at the annual meeting.

The combined SGD Awards Ceremony & Seds and Suds was held on Tuesday evening of the meeting and was highly attended. SGD honored **Dr. Isabel Montañez**, of UC Davis as the 18th recipient of the **Laurence L. Sloss Award** in recognition of her outstanding career integrating stable isotopes, geochronology, and sedimentology in interpreting Earth's past climate and geochemical feedbacks.

Dr. Isabel Montañez (center), the 2017 Lawrence L. Sloss Award winner with citationist Dr. Mike Pope and SGD Chair Gary Gianniny.

Edward (Ted) Matheson (left) was presented the 2017 SGD Student Research Grant Award by SGD Chair, Gary Gianniny (right).

Ted's award winning PhD project at the University of Nebraska- Lincoln is entitled:

"Sedimentology and Stratigraphy of the Phosphoria Rock Complex in the Bighorn Basin, Wyoming: Implications for Paleoceanography and Paleoclimate".

Paul Dohm (left) and Tadasse Alemu (center) are congratulated as outstanding SEPM/SGD Student Poster at the Seds and Suds gathering by SGD Chair Gary Gianniny (right). Charlie Zeng and Nicholas Fedorchuk were also SEPM/SGD Student Poster award winners, but they missed the suds!

SEPM-SGD Outstanding Student Poster winners -

This year's 2017 SEPM/SGD "New Insights into the Dynamics of Stratigraphy and Sedimentation" student poster winners (receiving $500 each) were:

Tadesse Alemu of Oklahoma State University for his poster "Outcrop analog for intracontinental sags (ICONS): A case of the Mekele basin in northern Ethiopia"

Charlie Y.C. Zang of the University of Saskatchewan for his poster "Inchnology and depositional environments of the upper Ordovician Stony Mountain Formation of the Williston basin, Canada; Refining ichnofabric models for epeiric sea carbonates".

Paul Dohm of Fort Lewis College for his poster "Holier than Thou? Dolomites in Paradise; Matrix porosity development in the Redwall Limestone, Grand Canyon""

Nicholas Fedorchuk of the University of Wisconsin-Milwaukee for his poster " Carboniferous glaciotectonized sediments on the western Rio Grand Do Sul Shield, Parana' basin, southernmost Brazil"

In Memoriam-This is a tribute to SGD members that we lost in 2017 and early 2018 that have been important leaders in the sedimentary community as well as our dear friends: Bob Dott, John Dyni, William Corea, David Krinsley, Charles Rice and James Trexler, and Tom Laudon.

What's New for 2018?

Plan on joining us for the **129th GSA Annual Meeting in Indianapolis, Indiana** in October 2018. SGD has sponsored a very diverse group of 45 sessions this year, so be sure to get your abstracts in by August 14, 2018. We will also be running our annual SGD/SEPM sponsored poster session for student researchers. Students please consider submitting to this session where you'll meet other dynamic student researchers and enjoy a fun networking opportunity all while competing for cash prizes! Also start saving up to get a very spiffy SGD water bottle at our booth.

Coming up in 2020:

The International Sedimentary Geology Congress in Flagstaff Arizona May 26-29. The Sedimentary Geology Division of GSA is very excited to collaborate with the meeting host, The Society for Sedimentary Geology (SEPM), and with the International Association of Sedimentologists (IAS) to bring you an exciting week of meetings and great field trips.

We've Joined Social Media!

Find us on Facebook, Instagram and Twitter @GSA.SGD!

Keep an eye on our the crazy wild sed pictures on Instagram!

Get involved in 2018 with the Sedimentary Community!

We could use your help and ideas in making SGD a dynamic and vibrant research community. Consider proposing a Penrose Conference or a Thompson field Forum (www.geosociety.org/penrose or www.geosociety.org/fieldforums/), nominating leaders in our community for the Sloss Award (rock.geosociety.org/sed/SGD_Awards2.html#Sloss) or serve on a SGD committee.

We are looking for a new SGD Secretary Treasurer and new JTPC representaive, as Linda Kah is ready to pass the torch after a spectacular 9 years of service to the Sedimentary Geology Division, as is Ryan Morgan after years of service as well.

If you're interested in either of this critically important leadership roles in SGD please, contact Gary Gianniny or Amy Weislogel!

Welcome to our new SGD Student Representative Angela Delaloye of Comahue National University (UNCo), Argentina,. We look forward to her help expanding SGD's international network!

2018 SGD Officers:

Chair – Gary Gianniny
(gianniny_g@fortlewis.edu)
Vice Chair – Amy Weislogel
(Amy.Weislogel@mail.wvu.edu)
Secretary Treasurer – Linda Kah
Student Representative – Angela Delaloye,
Webmaster – Stefania Laronga
Past Chair – Kate Giles

Wishing all the best to our past Chair, Kate Giles, and our past Student Representative, Rachelle Kernen. Thanks for all your hard work Kate and Rachelle, we really appreciate your exceptional service to SGD!

2018 Joint Technical Program Committee (JTPC) Representatives for SGD:

Piret Plink-Bjorklund, Colorado School of Mines
Ryan Morgan, Tarleton University

A special "Thank you" to all those who served on our 2017 SGD Committee

SEPM Activities at 2018 ACE
Salt Lake City, UT – May 19-23

SEPM Short Courses (details at http://ace.aapg.org/2018/technical-program/short-courses)

- SC06: Sequence Stratigraphy for Graduate Students (SEPM), 19-20 May
- SC07: Advanced Sequence Stratigraphic Applications for Exploration (SEPM), 19-20 May
- SC11: Sequence Stratigraphic Analysis of Shales and Mudstones (SEPM), 20 May
- SC16: Rock and Seismic Sequence Expression of Carbonate Systems - Exploration and Reservoir Characterization (SEPM), 24-25 May

SEPM Field Trips (details at http://ace.aapg.org/2018/technical-program/field-trips)

- FT04: Stratigraphic Elements of Shoreface and Deltaic Strata, Upper Cretaceous of the Northern Book Cliffs (SEPM), 17-19 May
- FT07: Upper Cretaceous Stratigraphy, Depositional Environments, and Reservoir Geology of the Henry Mountains Region, Southern Utah (SEPM), 23-17 May
- FT12: Lake Type Evolution and Microbialite Facies of the Eocene Green River Formation, Wyoming (SEPM), 24-26 May

Other SEPM Events

Monday, May 21:	AAPG/SEPM Student Reception, Hilton SLC Center, 6-8 pm (Free entry)
Monday, May 21:	SEPM Research Groups, Marriott SLC, 7pm-10pm, Marriott City Creek (Free entry) Carbonates RG; Deep Water RG; Clastic Diagenesis RG; NAMS RG; Sequence Strat RG
Tuesday, May 22:	SEPM Research Symposium, Salt Palace CC, Morning and Afternoon Oral Sessions
Tuesday May 22:	SEPM Business Luncheon with Margie Chan – Geoconservation: Preserving Classic Outcrops, Resources and Accessibility, Salt Palace CC (Ticketed event - $50)
Tuesday May 22:	SEPM Foundation Reception, Marriott City Creek (By Invitation Only)
Tuesday May 22:	SEPM President's Reception and Awards Ceremony, Marriott City Creek (Free entry)

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