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The SEDIMENTARY Record

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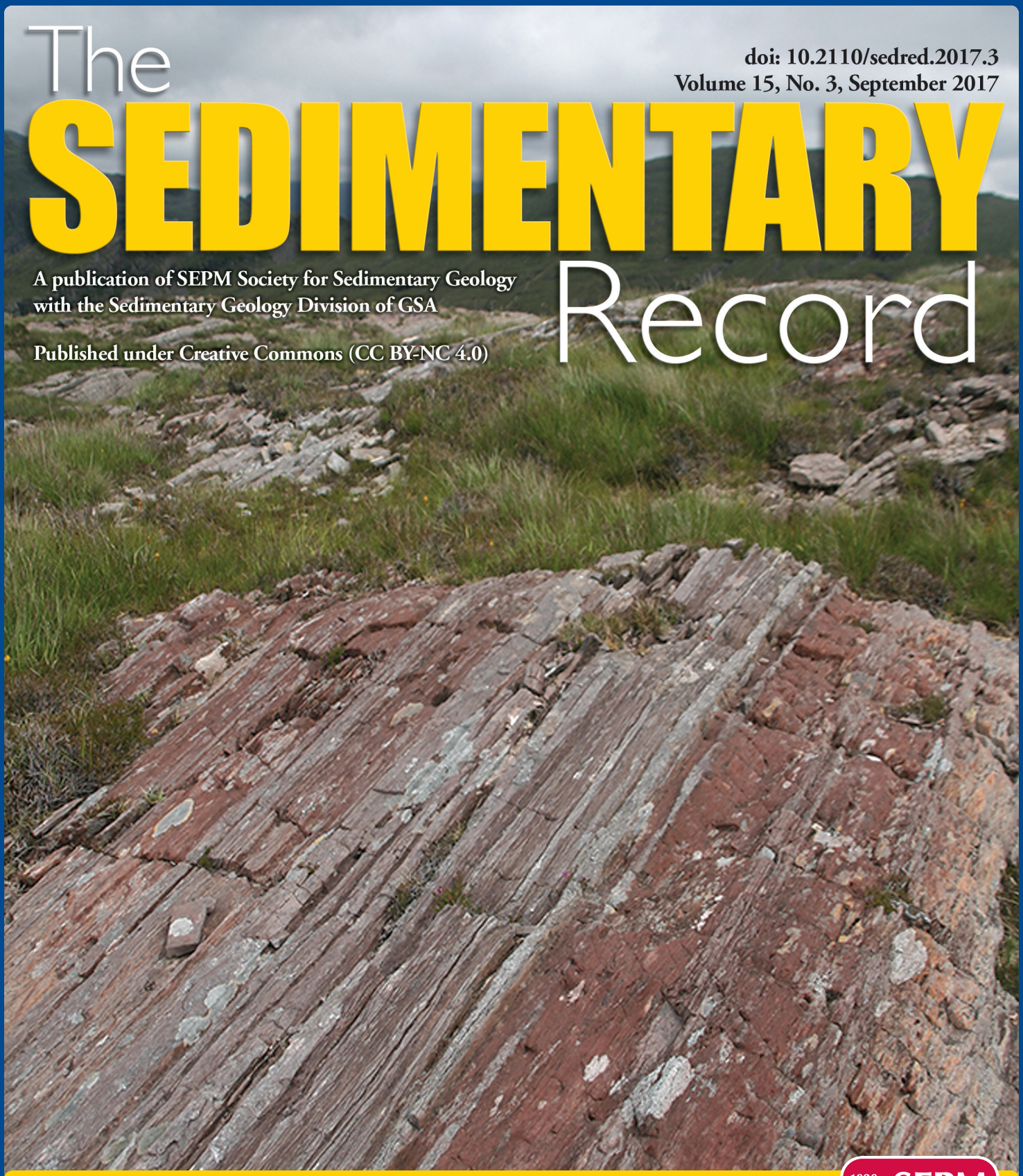

INSIDE: CHALLENGING ORTHODOXY: IS THE PRESENT THE KEY TO THE PAST?

PLUS: PRESIDENT'S COMMENTS, SGD NEWS, UPCOMING MEETINGS AND EXHIBITS, ONLINE NEWS

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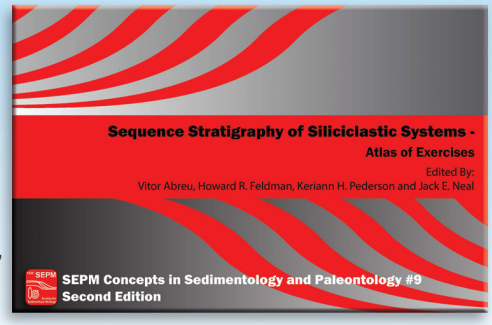
Concepts in Sedimentology and Paleontology 9 (2nd edition)

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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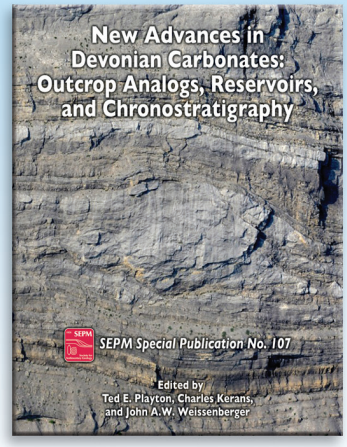

Special Publication #107

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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Cover image: outcrop of the Salrock Formation. Killary Harbour, Western Ireland

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Challenging orthodoxy: is the Present the Key to the Past?

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ABSTRACT

"If choosing a 'present' to be the 'key to the past' I wouldn't choose the present 'present'". The uniformitarian principle guides us to interpret sedimentary successions in the rock record through the prism of modern depositional environments: observing and measuring processes and products in, for example, a present-day delta environment should provide us with the information that we need to interpret ancient strata as deltaic. To a certain extent this is valid, but awareness of the limitations is important to successful analysis of sedimentary successions which can be difficult, if not impossible, to relate to anything seen around the world today.

This article is in two parts. In the first there is a somewhat speculative discussion of some of the issues that arise when using a uniformitarian approach to the analysis of the sedimentary record. This is followed by a case study of a Silurian succession that cannot easily be interpreted in terms of modern environments.

THE HISTORY

The origins of the concept of uniformitarianism lie back in the eighteenth century when early geologists, including James Hutton, recognised that processes occurring on the Earth's surface today could explain the formation of sedimentary rocks. At the time this was to provide a scientific alternative to catastrophist views and it was a concept that Charles Lyell (Fig. 1) further developed in 'The Principles of Geology' in the early part of the 19th century (Lyell 1832) to argue that, in general, the rates of surface geological processes have been constant through Earth history. Subsequently, the proposition that we can use observations and measurements of present day surface processes and their products as a fundamental tool to interpret the sedimentary record has become a tenet of sedimentology and stratigraphy. A note of caution was expressed by Derek Ager in the mid twentieth century (Ager 1973) by pointing out that occasional, large scale catastrophic events have been important in forming sedimentary successions, but in general the 'present is the key to the past' approach is widely used in geosciences.

THE PROBLEM

The limitations of the approach become apparent when the uniformitarian principle is extended from physical and chemical processes to whole environments of deposition, in particular, the assumption that modern environments can provide analogues for successions in the sedimentary record. It is quite a beguiling proposition that we can illustrate our interpretation of a subsurface succession by reference to somewhere on the planet today and is especially useful when attempting to create a geological model that a non-geoscientist can readily appreciate. The first problem with using modern analogues is that every depositional environment that has existed in Earth history has been unique and formed by combinations of processes that have never been replicated. The exact modern analogue for a past environment is of course a chimera generally appreciated by sedimentologists, but what seems to be less well appreciated is how wide of the mark modern settings can be as potential analogues. In this article some of the potential pitfalls in using the present as the key to the past in the interpretation of depositional environments are explored.

ICEHOUSE AND GREENHOUSE WORLDS

The Earth has gone through several cycles of overall cooler and warmer climate through the Phanerozoic: we have been in an icehouse world for the last few million years but most of the last 600 My have been times of warmer conditions in a greenhouse world (Fig. 2). A principal consequence of a long-term colder climate is the presence of large polar ice caps which hold enough water to change global sea level by tens of metres as the ice caps expand and contract. Evidence from the Holocene suggests that these changes in sea level occur relatively rapidly and high magnitude, high frequency sea level changes affect all depositional environments linked to marine base level and climate fluctuations affect deposition in continental settings. Consequently, modern environments are responding to sea level and climate changes that have occurred in the last few thousand years and at geological time scales are in transition between lowstand and highstand states.

Along coasts, recent episodes of sea level fall and subsequent rise have resulted in incision of coastlines and coastal plains at river mouths forming estuaries. Further upstream rivers have cut into their floodplains,

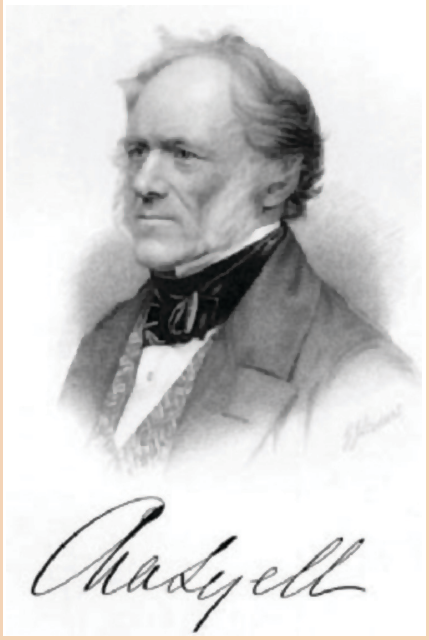

Figure 1: Charles Lyell, an early proponent of the uniformitarianism principle of the present being the key to the past: to what extent should this approach be applied with caution?

restricting lateral migration and confining channel belts. Out on continental shelves tidal sand bars formed during sea level lowstand may now be inactive as they are no longer subject to tidal currents on the shelf. Observations and measurements made in these modern settings do not reflect long-term stable conditions that would have existed under greenhouse climates. Confined estuaries are a specific coastal response to rapid fall and rise of sea level; over longer periods of time rivers reach an equilibrium with the basin plain depositing from distributive river systems that form broad expanses of channel and overbank deposits; longer-term sediment supply and reworking by tidal currents on the shelf can result in thick amalgamated packages of sands.

During long periods of a greenhouse world, such as the Cretaceous, any fluctuations in relative sea level due glacio-eustacy would have been minor. Coastal environments may therefore have looked very different to those of today, with low-relief coastal plains merging into paralic regions. In particular, the distributive fluvial systems that are important regions of sedimentation in many settings could have reached shorelines and fed coastal depositional systems, a relationship that is only seen in a few places today (Fig. 3).

THE APPROPRIATE MODERN ENVIRONMENTS

There is a long history of studies of rivers from across North America and Europe that have contributed to the body of literature on fluvial forms and processes. These studies are widely used to aid the interpretation of fluvial successions, for example by analysing the ways that various mid- and side-channel bars migrate and assuming that these are similar to the ways that bars have led to the formation of cross-stratified sandstones in channel deposits. However, the vast majority of rivers in Europe and North America are not in sedimentary basins and are therefore not sites of net sediment accumulation (Hartley et al 2010; Weissmann et al 2010). The same group of authors also contend that most modern depositional fluvial systems in other parts of the world are distributive in form (e.g. Fig 3), rather than tributary, the exceptions being where distributive channels join a trunk channel in large basins such as the example of the River Ganges in the Himalayan foreland basin. A distributive form of river system has been recognised in sedimentary basins at a wide range of scales, in various climatic zones and in all tectonic settings (Hartley et al 2010; Weissmann et al 2010).

The choice of analogue for a fluvial succession should therefore consider the possibility, if not probability, that the basin-scale river pattern would have a distributive form and that any modern, tributary river that is not in an aggradational setting cannot be an appropriate analogue. At the scale of individual channels and their associated floodplains, modern rivers that are non-depositional or erosional cannot provide any insight into how a succession of channel sill and overbank is built. Similarly, sandy deserts that are undergoing deflation, beaches and shorelines that are currently regions of net loss of sediment are not going to provide analogues for sedimentary successions in the rock record.

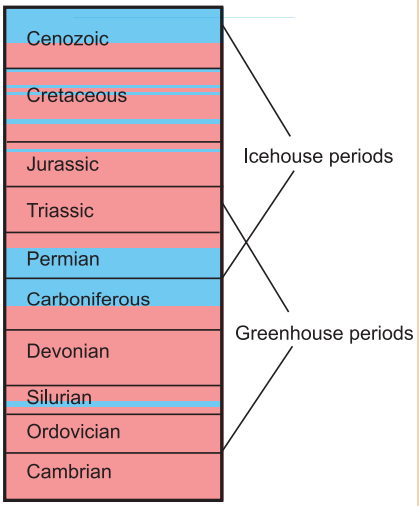

Figure 2: Icehouse and greenhouse worlds during Phanerozoic (Royer et al. 2004)

HIGH MAGNITUDE DEPOSITIONAL EVENTS

On a human timescale there are occasional extreme weather events such as cyclonic storms and floods that are sometimes referred to as 'hundred-year' or 'thousand-year' occurrences, implying that the magnitudes are, on average, only experienced at these frequencies. However, if the longer timescales involved in the accumulation of sedimentary successions are considered, are there likely to be larger magnitude events that occur during periods of tens to hundreds of thousands of years?

Floods are most commonly associated with unusually high rainfall events which may on occasions be considered extreme (Browne 2002). They may also be the result of phenomena such as natural dam bursts and jokhulhaups triggered by tectonic or volcanic activity. The deposits of these truly catastrophic

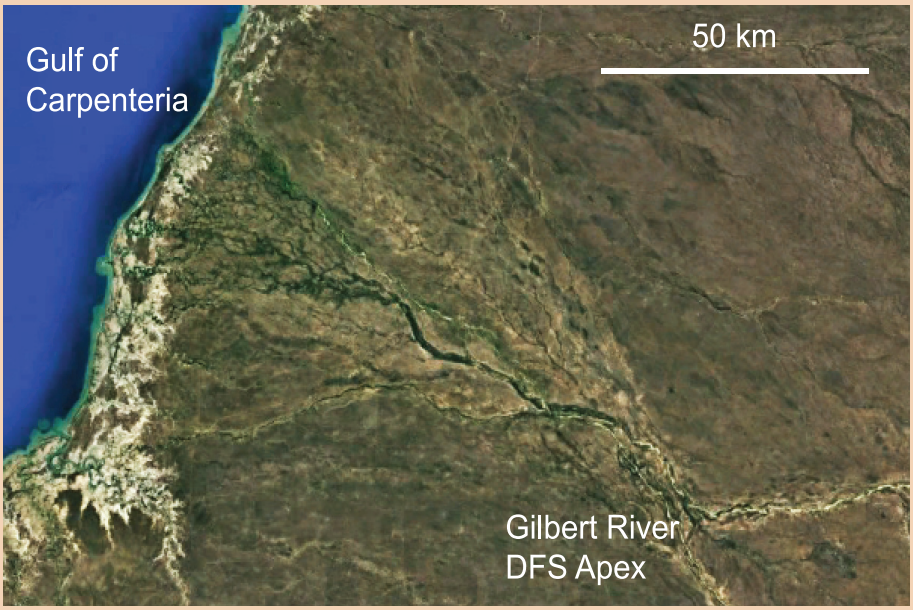

Figure 3: The Gilbert River in northern Queensland is one of few modern examples of a distributive fluvial system reaching the coast (Owen et al. 2015

floods indicate flooding events of an almost unimaginable scale: gravelly bars resulting from a flood event in the Altai Mountains, Siberia, are up to 120 m tall and 5 km in length (Carling et al. 2002). These particular deposits are in an area that is undergoing net degradation and along with most continental glacial deposits they do not have long-term preservation potential. Flood events such as this are the product of an unusual set of circumstances, but serve as a reminder that provided something is physically possible there is every chance that such an event could have occurred though geological time, even if it requires imagining something that is way outside the range of scales of processes experienced on human timescales.

Strong winds associated with storms also affect continental settings and in desert regions events when there is large-scale transport of sand within ergs is associated with storm events. Wind velocities are determined by distances between areas of different atmospheric pressure: the extent of the region of higher pressure associated with polar ice caps varies between glacial and interglacial (Fig. 4), with compressed global air circulation belts when polar ice is more extensive. This raises the possibility that during glacial periods in earth history winds may have been stronger than any experienced today, with the higher velocities capable of carrying coarser sediment. Assumptions that the maximum grain sizes seen in modern aeolian sands apply to wind-blown deposits in the stratigraphic record may therefore need to be questioned.

There are some depositional processes and their products that are so infrequent relative to human time scales that they are difficult to observe and measure, whatever their magnitude. The deep seas are challenging environments for analysing modern processes, and there are few documented examples of turbidity currents on record: the data from the Grand Banks earthquake (Heezen and Ewing 1952) is still one of the most commonly quoted examples of a modern turbidity current. On alluvial fans in arid environments debris flow processes are a primary mechanism for building up the sediment body, but again they are relatively infrequent events that are difficult to predict and measure whilst they are occurring. Studies of 'active' fans from SW USA (Beaty 1970) suggest that the recurrence interval for debris flow events on an alluvial fan is in the region of 300 years.

THE EVOLUTION OF LIFE

The large-scale changes fauna and flora on land and in the sea through time are the most obvious ways in which modern environments will look quite different from areas of deposition in geological history. The way that different assemblages of carbonate-forming organisms during the Phanerozoic have created distinct ecosystems and limestone facies is well documented (Tucker 1992). The impact of the development of vegetation on the land surface has also been well recognised: Schumm (1968) noted that the binding effects of root systems from different plant groups would have controlled the stability of floodplain surfaces and their susceptibility to surface scouring or the erosion by river channel margins. Grasses have dense, fibrous root networks that are extremely effective at binding soil and therefore have a big impact on river bank stability. However, modern grasses did not become widespread until the mid-Cenozoic and although other flowering plants will have acted to stabilise land surfaces they may not have been so effective. Before flowering angiosperms evolved and diversified in the mid-Cretaceous, plant communities were dominated by gymnosperms with much simpler root structures with a weaker soil-binding effect (Fig. 5).

Continental deposits are widespread in Devonian strata, for example in north western Europe, and were formed at a time when land plants were very simple and probably relatively sparse. The absence of stabilising vegetation would have enabled river channels to laterally migrate across floodplains with ease, resulting in broad sheets of fluvial channel sandstones. Consequently, channel margins are rarely seen, and

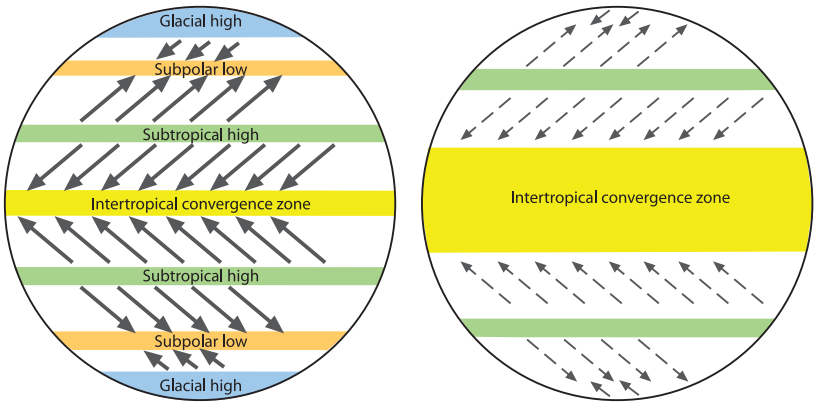

Figure 4: During glacial intervals the global wind belts are more compressed resulting in potentially stronger winds compared to interglacial intervals (Glennie 1987)

in the Devonian strata on Anglesey, north west Wales, the lateral accretion surfaces (epsilon cross stratification) first recognised by Allen (1965) are not associated with erosion surfaces representing channel margins. In the present-day vegetation on floodplains is only absent in very hot and dry or very cold settings: river channels in these places may show the same tendency to lateral migration and sweep across the alluvial plain. These settings do not provide appropriate analogues for the Devonian deposits of NW Europe. The Devonian is perhaps an extreme example of differences in vegetation, but any fluvial environments from pre-Mid Cenozoic times are unlikely to have reliably similar processes of channel formation and migration to the present day because of the importance of grasses on floodplain stability.

A CASE STUDY OF DIFFICULT INTERPRETATION

So having considered some of the general problems of using the present is the key to the past approach, there follows a case study that provides an example of how difficult it can be to find a modern analogue for a succession.

On the southern side of Killary Harbour in County Galway, Western Ireland, there is a hillside outcrop of rocks mapped as being part of the Upper Silurian Salrock Formation (Graham et al. 1989) (Fig 6, 7a). The succession was described by Laird (1969) as being 814 m thickness of sandstones and mudrocks that are generally red in colour. They are stratigraphically above the Lough Muck Formation and the basin setting is considered to be back-arc. Beds are typically tens of centimetres thick and the following depositional features are present

(a) The succession is heterolithic at different scales
(b) There appears to be a complete absence of any erosional surfaces but conversely there are upward-convex surfaces indicating preservation of dune and bar forms
(c) Cross-bedding apparently indicates bimodal flow directions
(d) Low angle inclined heterolithic cross stratification is present in some beds
(e) Both ripple-scale cross-lamination and dune-scale cross-bedding show evidence of stoss-side preservation of laminae, e.g. as climbing ripple cross lamination (Figs 7 b and c).
(f) The wavy ripple forms present are interpreted as preserved current ripples

This facies assemblage is consistent with deposition in a strongly tidally-influenced environment (Dalrymple 1992). Deposition from bidirectional currents is difficult to establish with confidence because of the smoothly-eroded rock surfaces preclude measurements of true dips of cross-beds, but the inclined heterolithic stratification, flaser and wavy lamination and heterogenous character are all consistent with tidal conditions.

There are however, a number of aspects of the Salrock Formation that make it difficult to find a direct modern analogue. Firstly, the succession is largely devoid of body fossils, the only shelly material reported being sparse occurrences of Lingula (Laird 1969), and there is no sign of any trace fossils. Tidally-influenced environments are normally well-oxygenated and benign for shallow marine organisms. Secondly, the formation has a substantial thickness of over 800 m (Laird 1969) and shows remarkably little variation from bottom to top: there are changes in the proportions of different facies at different intervals, but no overall trends to suggest changes in the environment through time. Thirdly, the wholly aggradational pattern of the succession and absence of any evidence for erosive surfaces indicates

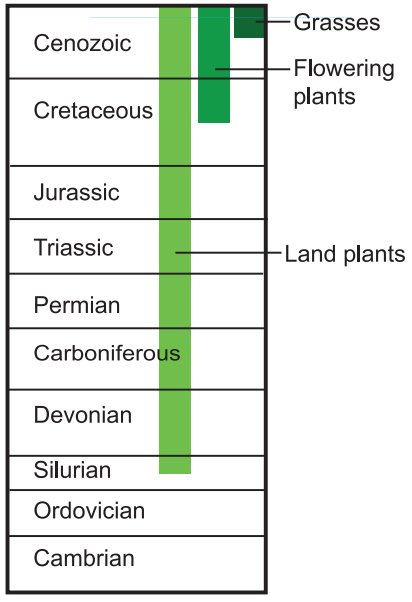

Figure 5: Stages in the evolution of land plants (Schumm 1968)

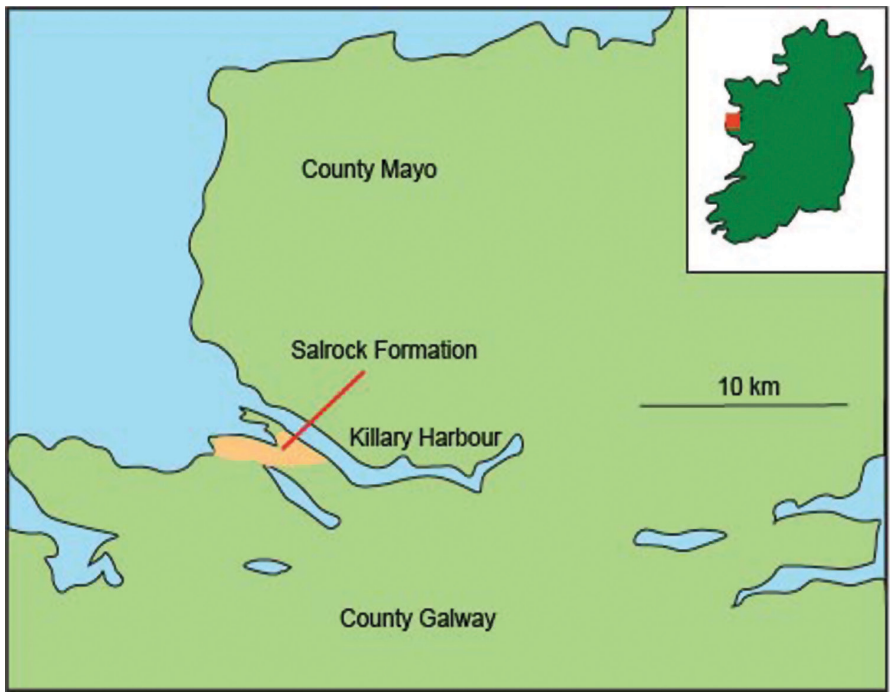

Figure 6: Location map for the Silurian Salrock Formation, Western Ireland

a balance between subsidence and sediment supply during the history of accumulation in the basin.

The setting for the deposition of the Salrock was relatively shallow with strong tidal influence and apparently anoxic conditions with high rates of fine sediment supply and increasing accommodation to keep pace with sedimentation in a back-arc setting. No analogous setting exists today and it does not slot easily into any established facies model pigeonholes. It is one of probably many instances where an innovative solution is required to solve the problem of interpretation of the environment of deposition.

SOME QUESTIONS

Do modern estuaries provide appropriate analogues for anything other than icehouse periods when there was rapid, high magnitude sea level variation? Are new depositional models required for river mouths at coasts that are undergoing transgression where an 'estuary' may not be laterally-confined in an 'incised valley' (aren't all valleys incised?).

Are the processes in modern rivers that are in a degradational or non-depositional setting relevant to understanding fluvial successions in sedimentary basins if these processes are not leading to net accumulation? Do the same limitations also apply to modern coastlines where sediment may be being redistributed but not actually being preserved?

To what extent is the sedimentary record made up of the deposits of events that are of a higher magnitude than anything observed today? If, as Ager suggested, mega-events are disproportionately preserved in strata then studies of the smaller-scale processes are only providing an insight into the way that a fraction of the strata were formed.

How much modification of our models for pre-Cenozoic environments is required to take account of the effects of evolving organisms and ecosystems on surface and submarine processes? Pre-Phanerozoic environments on land and in the sea are well known to be very different from those of today, but the effects of changes in flora and fauna through time have continued right through to the recent times.

CONCLUSIONS

The fundamental tenet of Lyell's approach of using the evidence of modern physical and chemical processes to interpret the sedimentary

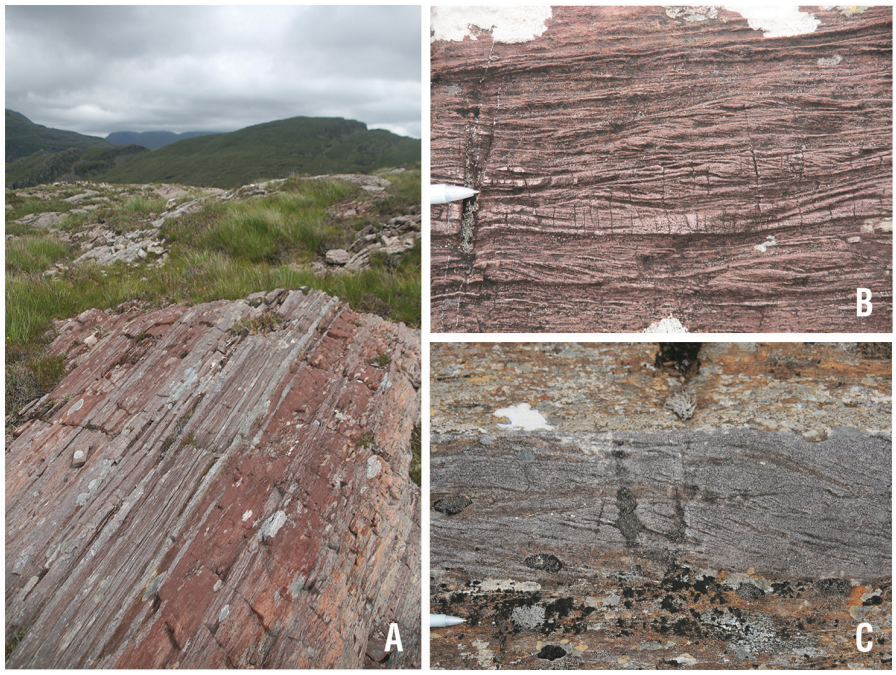

Figure 7: (a) outcrop of the Salrock Formation. Killary Harbour, Western Ireland; (a) climbing ripple lamination; (b) stoss-side preservation of subaqueous dune cross-bedding

record is sound: the problems arise in how it is applied. Modern environments do not provide an adequate range of analogues for the Phanerozoic and it is reasonable to interpret a succession as the product of a combination of processes in a setting not seen today. Choosing the right type of modern environment is critical, and any modern processes and products analysed from a non-depositional setting must be applied to strata which were self-evidently in a depositional setting with scepticism. Furthermore, the relationship between sea level changes, climate fluctuations and environments seen in recent history mean that conditions seen today are not representative of most of the Phanerozoic. The details and extent of these caveats to the uniformitarian principle require more discussion than is presented here as this article is intended to simply raise a few points for consideration.

An SEPM-sponsored conference session on this theme is planned for the annual meeting of the British Sedimentological Research Group to be held in Newcastle in December 2017 (www.bsrg.org).

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Accepted August 2017

PRESIDENT'S COMMENTS

Dear colleagues,

A while ago I was asking a friend what is the value for him to be a member of SEPM. He immediately and enthusiastically replied that for him it meant to be part of the crowd which published "those amazing red books", referring to the Special Publication Series. SEPM has been globally known and renowned for many, many decades as a society with very high scientific standards in publications, research conferences and topical sessions at annual meetings (jointy held with AAPG or GSA). SEPM is driving soft-rock sciences forward and providing the community with resonant, timely and sometimes controversial discussions through our books, journals and web materials. However, in current times the process of publication is undergoing changes and publishing societies, such SEPM, are presently confronted with the challenge of adapting to new demands of open access for all publications. This impacts the society in that publications have been a primary revenue stream but also in that with open access the usual value of a membership may be challenged in the near future.

Many scientific societies are experiencing a decrease in membership numbers. SEPM is also seeing membership numbers steadily decreasing. The recent crisis in the industry, sustained low oil prices for the longest time in recent memory, certainly has had its toll on membership numbers. Other factors also play a role, such as natural changes in the age structure of our community made us lose many long-term members to retirement or sadly even death. The quality of our publications and the high attendance of our topical sessions and research conferences have protected us so far from the worst consequences of these events. But we must bring new members to help replace those we have lost because of the age structure, those we have lost through the downturn, and also to bring new, young scientists into the society. The future of SEPM will certainly depend on our ability to maintain our brand value to the scientific community, but also in being creative in finding ways to offer additional value to our members. The survival of scientific societies such as SEPM will depend both on the loyalty of their members and on how the societies can adapt to offer more or different value for their members at this time of change.

As part of the process of finding solutions for the future that can bring more benefits for our members, we are developing closer synergies with our sister society IAS – International Association of Sedimentologists- and are working on improving synergies with GSA and with AGU. Both SEPM and IAS are committed to find ways to strengthen our relationship, while maintaining the internal culture and philosophy of the different societies. SEPM and IAS have established a joint committee to plan for our first International Sedimentary Geologic Congress in 2020. This will be an attractive opportunity to nurture an active and global sedimentary geology community, which will be more than ever attractive to members globally. Furthermore, I believe that that we should diversify and expand our effort to enhance the impact and the visibility of our science by expanding and building our relationship to other larger societies where sedimentary geology is currently only marginally represented, as well as to expand to other regions globally.

In summary, the future will continue to bring new challenges and the society will have to address them to keep thriving. Your ideas and opinions are very important for us. Please share your thoughts with us as SEPM is navigating through these challenging times and prepares to face the future.

Maria Mutti, SEPM President

SEPM Society for Sedimentary Geology
"Bringing the Sedimentary Geology Community Together"
www.sepm.org

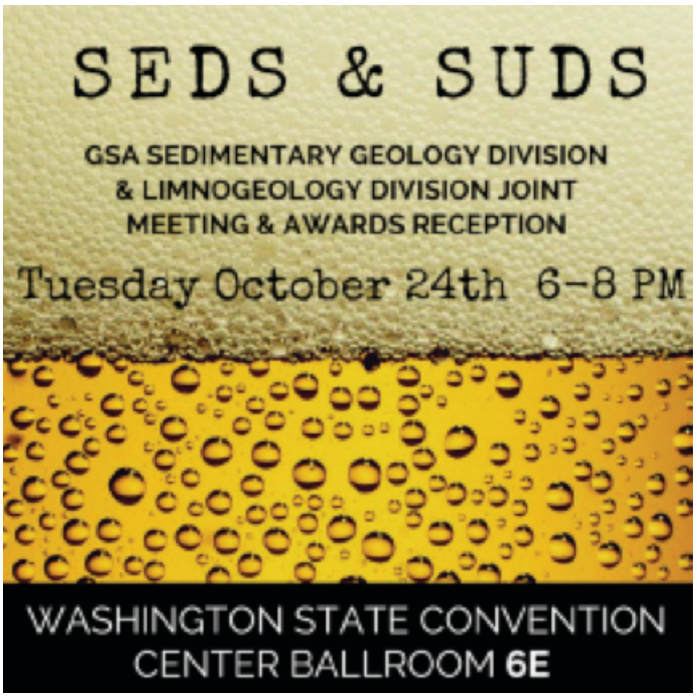
THE GEOLOGICAL SOCIETY OF AMERICA®

SEDIMENTARY GEOLOGY DIVISION

2017 GSA Annual Meeting in the Emerald City - Seattle, WA - JOIN US!

Greetings to all the GSA Sedimentary Geology Division (SGD) members and those of you that are fascinated by all things sedimentary. As you may know, many of our interests, activities, and events are shared with SEPM (Society for Sedimentary Geology), which is why you are seeing our newsletter here in SEPM's Sedimentary Record publication. Please consider yourselves invited to all our SGD events at the upcoming GSA Annual Meeting in Seattle starting with our main event,

which is….



The SGD (with SEPM and STEPPE) has a single grand joint meeting with the GSA Limnogeology Division where we will be honoring all 2017 award recipients of the SGD and LD including this years *Laurence L. Sloss Awardee.*

2017 Laurence L. Sloss Award

Dr. Isabel P. Montañez

The Sedimentary Geology Division is pleased to announce ***Dr. Isabel P. Montañez*** *(UC- Davis) as the 2017 Laurence L. Sloss Award recipient.*

Isabel has been on the forefront of addressing significant problems in sedimentary geology since the late 1980's, being awarded the SEPM James Lee Wilson Award, selected as an AAPG Distinguished Lecturer, and elected as a fellow to GSA, the Guggenheim Foundation, and the AAAS. She is also taking over the reigns as President of the GSA in 2017. Early in her career Isabel spent time learning different techniques that integrate stable isotope and trace element geochemistry to better understand diagenesis of carbonate sediments. These diagenetic studies lead Isabel to study paleoclimate and CO2 in the atmosphere through stable isotope and trace element geochemistry and high-resolution geochronology of speleothems, paleosols, and marine successions.

One of Isabel's strengths as a scientist is integration of rigorous labwork and fieldwork and establishing collaborative efforts to try and understand Earth's climate history and atmospheric chemistry. Isabel has also served as an inspiration, mentor, and major supporter of the efforts of women scientists at all levels across the globe.

Dr. Isabel Montañez will be recognized both at the GSA Presidential Address and Awards Ceremony: Sunday, October 22, from 12:00—1:30 PM and at the SGD Seds & Suds Award Reception: Tuesday, September 27 from 6-8 PM. Join us to honor Isabel's great achievements.

Do you know a colleague who is particularly deserving of the Laurence L. Sloss Award for Sedimentary Geology?

Please forward nominations to Linda Kah, lckah@utk.edu

2017 SGD Student Research Award Recipient

Edward Matheson (University of Nebraska-Lincoln) has been selected for the **2017 SGD Student Research Grant Award** for his Ph.D. project entitled: "Sedimentology and Stratigraphy of the Phosphoria Rock Complex in the Bighorn Basin, Wyoming: Implications for Paleoceanography and Paleoclimate".

Edward (Ted) will receive a $500 cash award (plus $500 travel expenses to the upcoming GSA annual meeting in Seattle) in addition to the GSA research grant award he received. *Congratulations Ted!*

2017 Stephen E. Laubach Structural Diagenesis Research Award

Victoria Igoe is the **2017 Laubach Research Award recipient.**

Victoria is a MS graduate student at the University of Wisconsin-Madison and will receive a $2500 award for use toward her research project on "The effect of meniscus geometry hematite cement on mechanical and hydrologic properties of quartz arenite".

The Stephen E. Laubach award is an interdisciplinary award that promotes research combining structural geology and diagenesis. The award is given jointly by SGD and Structural Geology and Tectonics divisions. Follow this link to apply for next year's award by April 1, 2018: http://rock.geosociety.org/sgt/Laubach.htm

Edward Matheson, Victoria Igoe, as well as award winners (to be announced) of the 2017 SGD/SEPM sponsored student poster session will be recognized at the Seds and Suds event.

SGD Booth at GSA

New this year the SGD will have a booth (Booth #112) at the Annual Meeting in Seattle. The booth will be maned primarily by SGD student members. Please stop by & encourage all students to stop by our booth to meet other soft-rockers and learn about the benefits of becoming a SGD Student Member. Please contact our Student Representative, Rachelle Kernen rkernen@miners.utep.edu to help man the booth! This is an excellent opportunity for you to network and connect with other SGD members!

2017 GSA Annual Meeting SGD-Endorsed Sessions

WOW! Take a look (*using the links below*) at the wide variety of the whopping 103 topical sessions SGD will sponsor at this year's GSA Annual Meeting in Seattle. Quick Link (*refine search on SGD sponsorship*): https://gsa.confex.com/gsa/2017AM/webprogram/start.html

SGD/SEPM Student Poster Session

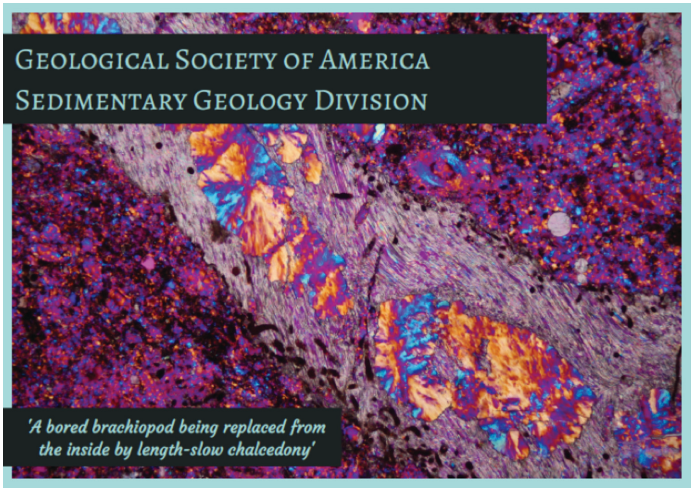
WT84. The Dynamics of Stratigraphy and Sedimentation (Posters)
Chairs: Gary L. Gianniny, Maria Mutti

Come and meet the next generation of sedimentary scientists and see their cutting edge new research. Quick Link: https://gsa.confex.com/gsa/2017AM/webprogram/Session43306.html

Thank you to our JTPC (Joint Technical Program Coordination) Committee (Ryan Morgan and Piret Plint-Bjorklund) for organizing a stellar sedimentary program for the upcoming GSA meeting. We will need a replacement on this committee for Ryan for the 2018 meeting in Indianapolis, IA– so here's another opportunity to get directly involved with SGD.

2017 SGD Postcard

Check out this psychedelic photomicrograph of a partly bored brachiopod shell infilled with length-slow chalcedony. This photo was uploaded to the SGD Facebook page by Madeline S. Marshall. Visit our Facebook page to find more really cool sed-based photos by fellow SGD members. Also upload your favorite original sed photos for a chance to have yours selected for next year's postcard.



*Pick up your **FREE** SGD postcard at the GSA or SGD booths during the meeting or at Seds & Suds get together.*

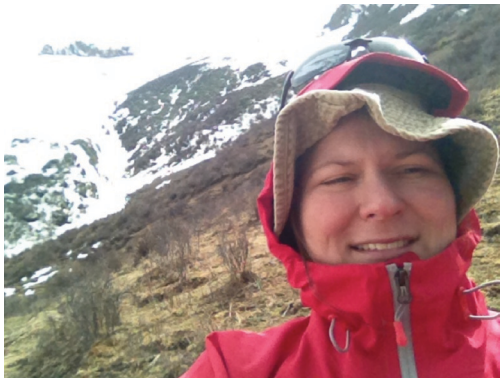
SGD on Social Media

Don't forget to follow us on Instagram and Facebook @sgd.gsa! Tag us in your favorite sedimentary geology photos (hash tag or page tag) and be featured in a post! The most 'likes' will make you a candidate for next year's postcard!

We congratulate Ph.D. student Madeline S. Marshall (@geomsm) from Macalester College in St. Paul Minnesota for being our winner this year!

Dr. Amy Weislogel Elected New SGD Vice Chair (2017-2019)

Dr. Amy Weislogel was recently elected to the position of Vice-Chair by the SGD membership.



Amy will serve in this position for 2 years starting with the Seds and Suds meeting at the Seattle GSA. She will then move into the Chair position in 2019. Amy is an Associate Professor at West Virginia University, where her research focuses on sedimentary geology and basin analysis. While serving on the SGD Management Board Amy plans to:

- further develop the use of technology to connect the various communities that hold interests in sedimentary geology, and use these connections to facilitate communication of ideas and dissemination of information
- continue to coordinate and broaden support for student opportunities in mentoring, professional workshops and skills training programs;
- increase networking with industry scientists both as members and as partners of the division, to foster cooperation in promoting sedimentary geology as a scientific field and in training the next generation of sedimentary geologists;
- increase advocacy of basic research in sedimentary geology to government and other funding agencies by demonstrating the fundamental role sedimentary geology plays in a host of societal challenges;
- support efforts that improve literacy in basic sedimentary geology concepts among the public at-large, with particular focus on concepts vital to our global society, such as food, water, energy and climate security.

SGD Student Representative

SGD student members are encouraged to reach out to our SGD student representative Rachelle Kernen (rkernen@miners.utep.edu) to share questions, concerns or ideas regarding membership with GSA or SGD (http://www.geosociety.org/aboutus/SAC.htm). This is a great opportunity for our young scientists to help guide GSA's future.

Any SGD Student Members who might be interested in being considered as our next SGD representative starting in Fall 2018 should talk to Rachelle or the SGD officers at Seds & Suds meeting or drop us a line.

Heads up students - don't forget: FREE FOOD & BEER at the Seds & Suds meeting!!!!

FINALLY… Get involved!

We could use your help and ideas in shaping SGD. You can be a judge, serve on a committee, help with our annual GSA events, or serve as an SGD officer.

2017 SGD Management Board:

Kate Giles (Chair; kagiles@utep.edu)
Gary Gianniny (Vice Chair; gianniny_g@fortlewis.edu)
Amy Weislogel (incoming Vice-chair; Amy.Weislogel@mail.wvu.edu)
Linda Kah (Secretary-Treasurer; lckah@utk.edu)
Rachelle Kernen (Student Representative; rkernen@miners.utep.edu)

SEPM Sponsored Sessions at GSA Annual Meeting.

Details about these sessions can be located at https://gsa.confex.com/gsa/2017AM/meetingapp.cgi/

- **T40. Earth Life Transitions and Major Continental Biological Events of the Phanerozoic**
  Lauren A. Michel, Erik L. Gulbranson, Neil J. Tabor
- **T43. High-Resolution Investigations of the Permian-Triassic Transition**
  Thomas J. Algeo, Hugo Bucher, Kimberly V. Lau
- **T59. Studies in Paleobiology and Paleoecology: In Honor of Professor David J. Bottjer**
  Thomas J. Algeo, Pedro J. Marenco, Margaret L. Fraiser, Matthew E. Clapham
- **T60. The Onset of the Great Ordovician Biodiversity Event (GOBE): Testing Hypotheses with Diverse Data Sets**
  Rebecca L. Freeman, Alycia L. Stigall
- **T63. Cephalopod Paleobiology and Paleoecology: A Tribute to Royal H. Mapes**
  Corinne Myers, Thomas S. Tobin, Benjamin J. Linzmeier, Margaret M. Yacobucci
- **T84. The Dynamics of Stratigraphy and Sedimentation (Posters)**
  Gary L. Gianniny (**SEPM & SGD Student Awards Session**)
- **T86. Controls, Geomorphology, and Depositional Architecture of Fluvial-Tidal Sediments through Space and Time.**
  Shahin Exton Dashtgard, Stephen M. Hubbard
- **T87. Fluvio-Deltaic Processes and Their Stratigraphic Record**
  Brandon McElroy, Jeffrey A. Nittrouer
- **T89. The Dynamics of Tectono-Sedimentary Systems During Basin Formation and Fill**
  Eugene Szymanski, Jacob A. Covault, Daniel F. Stockli
- **T91. Chemostratigraphy: Environments, Correlation, and Time (Posters)**
  Richard Fluegeman, Carlton E. Brett, Brian R. Pratt, Lucy Edwards
- **T92. Tectonics and Sedimentation, Avulsion, and Experimental Stratigraphy, and History of Western North America: A Celebration of Paul Heller's Career**
  Brady Z. Foreman, Majie Fan, Elizabeth Hajek
- **T93. Lacustrine Systems across Space and Time**
  Scott W. Starratt, Michelle F. Goman
- **T94. Limnogeology—Progress, Challenges, and Opportunities on Earth and Beyond: A Tribute to Beth Gierlowski-Kordesch**
  David B. Finkelstein, Lisa E. Park Boush
- **T219. Challenges in Tectonics 3: Dynamic Interactions among Earth-Surface Processes, Landscape Evolution, and Tectonics**
  Roman A. DiBiase, Elizabeth J. Cassel, Majie Fan
- **T225. New Perspectives on Cordilleran Tectonics, Paleogeography, and Metallogeny**
  Luke P. Beranek, Justin V. Strauss, Stephen J. Piercey

UPCOMING SEPM MEETINGS AND EXHIBITS

2017

Here is SEPM's schedule of meetings and exhibits for the rest of 2017. As you can see October is a very active month for SEPM.

- October 1-3: AAPG Mid-Continent Section Meeting, Oklahoma City, OK, USA. Booth #58. https://www.2017aapgmcsmeeting.org/

- October 10-12: International Meeting of Sedimentology (IAS-ASF), Toulouse, France. Booth #1. https://www.sedimentologists.org/ims2017

- October 15-18: ICE London, UK. Booth # 332. http://london2017.iceevent.org
  - ICE Short Course # 3 | Advanced Sequence Stratigraphic Applications for Exploration and Production, SEPM (Society for Sedimentary Geology), Saturday, 14 October – Sunday, 15 October 2017, 8:00 a.m.–4:00 p.m. http://london2017.iceevent.org/technical-program/short-course/details?articleid=40509

- October 22-25: GSA Seattle, WA, USA. Booth # 231. http://community.geosociety.org/gsa2017/home

- November 1-3: GCAGS – San Antonio, TX, USA – Booth #103. http://www.gcags2017.org
  - Luncheon Talk: Dr. Maria Mutti (Professor at Universität Potsdam, Potsdam, Germany, and President, SEPM [Society for Sedimentary Geology]), Talk Title: Photozoan-Heterozoan Carbonate Systems: Evaluating Cenozoic and Mesozoic Examples, Friday, November 3, 2017, 11:30am-1:00pm http://www.gcags2017.org/Luncheons/Luncheons.html#GCSSEPM

- December 3-5: GCSSEPM Perkins-Rosen Conference "Sequence Stratigraphy: The Future Defined" – Houston, TX, USA. http://www.gcssepm.org/conference/2017_conference.htm

- December 11-15: AGU – New Orleans, LA, USA – Booth # 932. http://fallmeeting.agu.org/2017

Online News!

SEPM's online content (*JSR, PALAIOS,* SEPM Books, GCSSEPM Proceedings) will be moving from its Highwire Press host to a new host – Silverchair (https://www.silverchair.com/). As a founding partner in the GeoSciencWorld aggregate, which is also making this move, SEPM will be giving its members and library subscribers some new and better online views and options at our new host. The URL www.sepmonline.org will be redirected to the new host in the later part of September. This change will cause some realignment of just how SEPM Members access their online content. However, once done, it should be easy process. The new look of the SEPM online content starts with the main landing page (https://pubs.geoscienceworld.org/sepm), which will look similar to the draft image (Figure 1). To access your personal SEPM online content you can use the link at the green arrow or at the yellow arrow. Those both take you to a sign-in screen (Figure 2) where you will need to enter your SEPM Member number (there is an option to 'recover' your member number) and then click the Login button which takes you back to the SEPM Landing page. Your name should appear in the upper right hand corner (where mine is located in Figure 1). You can then go to the journals or book collections that you have subscribed to and see the new viewing and search options, etc. or you can use the drop down menu by your name and see your 'account', which includes options for viewing or setting up – My Alerts; My Subscriptions; My Profile or Saved Searches. The migration of all of the GeoScienceWorld content, including the SEPM content to the new host is being implement over a few months so not all of the options may be functioning in September when SEPM is moving. We will keep you posted with emails with the details and any other news about this change.

Howard Harper, Executive Director

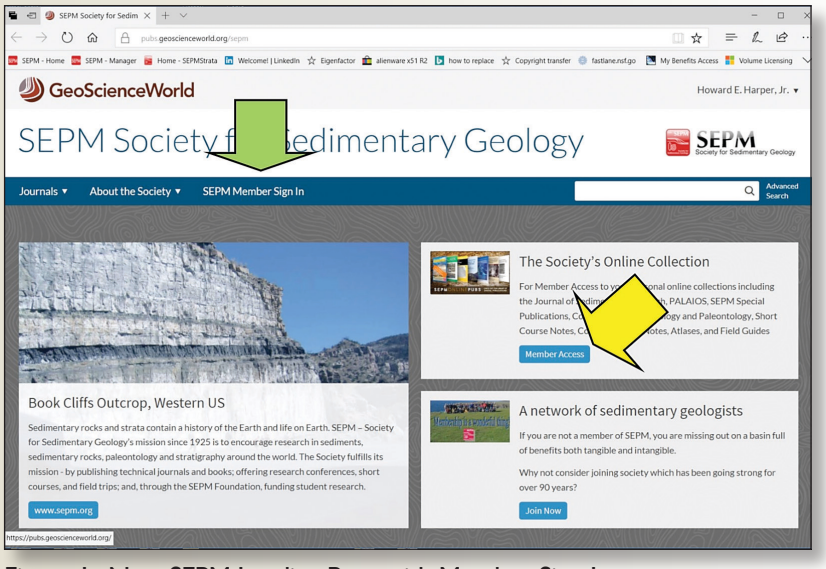


Figure 1: New SEPM Landing Page with Member Sign-In

Figure 2: SEPM Member Login from Landing Page

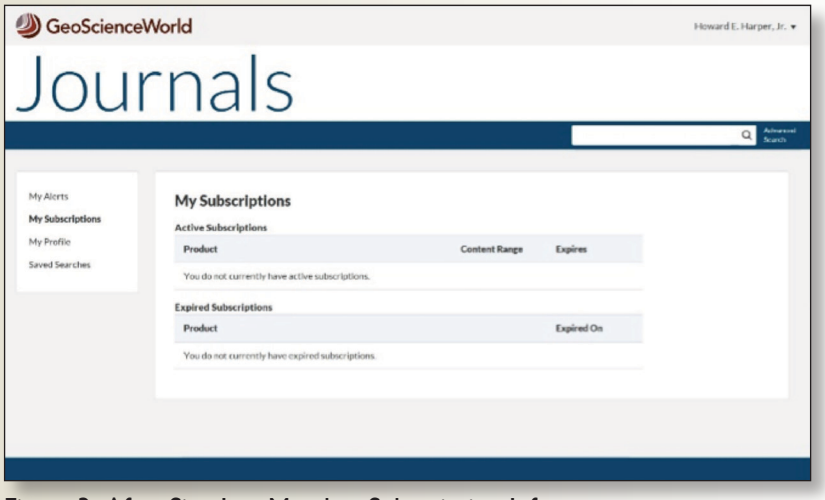


Figure 3: After Sign-In – Member Subscription Info