The International Sedimentary Geosciences Congress (ISGC) 2021 – An Opportunity to Shape the Future of Sedimentary Geosciences

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"Nothing in life is to be feared, it is only to be understood. Now is the time to understand more, so that we may fear less."

- Marie Curie -

Introduction:

The 1st International Sedimentary Geosciences Congress (ISGC) was conceived a few years ago as a unique opportunity for the broad sedimentary geosciences community to come together in a time of transformations. The aim of the congress is to allow the community to express, plan and implement what we all know are necessary changes to progress into the new decades with new motivations, ideas and purpose, fine-tuned to the concepts of a sustainable future. The Congress, organized by SEPM (the Society for Sedimentary Geology), was scheduled to take place in Flagstaff, Arizona, USA at the end of April of 2020. The rapid development of the COVID-19 crisis has delayed the congress to April 2021, still in Flagstaff, Arizona. After the events of the first half of the 2020, this Congress is more important than ever to set our directions for the future, so we hope you will read this article to be inspired to attend the Congress and help forge the future of sedimentary geosciences.

A confluence of human crises: a planet in distress

As we were preparing for the ISGC in 2020, the world stumbled into an unexpected crisis: a pandemic. The pandemic, so profoundly important for human society, could not have had more implications for the Sedimentary Geoscience community. We are writing with the SARS-CoV-2 (Severe Acute Respiratory Syndrome CoronaVirus 2) actively spreading across the planet, in a time of uncertainty for many (and for us). It is time for our community to set itself apart and gain an assertive and influential voice. The comfortable but unsustainable separateness of science from society must be quickly put aside. The unfortunate reluctance of many scientists to have *opinions* about social issues has to fade away. The prevailing attitude that geology is a *fun* distraction from these other problems must be put aside. While many are suffering and struggling, our work must find ways and means to help a very distressed society. We are called to action.

Why Sedimentary Geosciences? What can we do?

Geology is the study of earth, as the fundamental meaning of the word implies from the ancient Greek γῆ, gē ("earth") and -λογία, -logia, ("study of"). Words are important as they carry deep meanings. Geology is the ultimate natural science and utilizes as applied tools other maiden-sciences such as physics, chemistry or engineering to reach its full potential. Please note, it is not the other way around. Sedimentary geo-sciences sit proudly under the large umbrella of Earth Sciences primarily working with the sedimentary record. The sedimentary record (and its surprising preservation, if one knows how to seek and read it) is the canonical book of past conditions, of past climates and Earth movements. Although these might sound like arcane topics to the uninitiated, many decisions on how to deal with future changes in Earth's climate and landscape patterns should be informed by paleo-environmental experts, many of which (if not all) should be fluent in sedimentary geosciences. Sedimentary geology is omnipresent and a unifying force —it's literally everywhere we look, all the time.

Setting rather than following trends

We need to assert our purpose to have a more broad-based relevance and therefore a more sustainable employment footprint and larger contributions to democratic ideals and social equality. We need to quickly touch upon the recent modifications in the private funding resources affecting so many of our colleagues. Private funding supporting sedimentary geology (at least in some proportion) has historically originated from the oil and gas industry; an industry that has been on the verge of something… very ordinary for a long time.

As the historian Paul Lucier has nicely summarized in his recent review of the interaction between industry and science (Lucier, 2020), the industry *en large* has entered a phase of "outsourcing" after exiting a period of corporate investment on basic sciences and entering the laws of restructuring and downsizing. While this new attitude has had a dramatic effect on science (large corporate labs closing down like AT&T, IBM, DuPoint etc.), it also eventually trickled into the energy sector. The two authors of this article did indeed experience the end of two research laboratories in their short but intense industry careers.

Recent changes in perceived needs and overall financial weakness have been causing a dramatic decrease in support for the more "classical" stratigraphy and sedimentology sub-disciplines with loss of thousands of jobs (many of these jobs were of sedimentary geoscientists). That said, these classical sub-disciplines are the foundations of much of the earth sciences. Tectonics, paleoclimatology, paleoceanography, paleo biology, to mention a few, have had their most important contributions when fully integrated with stratigraphy and sedimentology.

Apparently the Industry has been infected – once again - by "medium-close follower disease". The excitement of the recent artificial intelligence and machine learning outburst is justifiable and understandable in our opinion; but, while everybody wants to be part of it, nobody is making much progress, as they are all outsourcing to the same groups. While running with a pile of money to Google-like companies, it is important to remember that the pseudo-precision of numbers generated by machines, although attractive to some rushed minds, should be used with the utmost care and not, by any means, as a substitute for direct observation of nature. In fact these efforts require often-prohibitive amounts of human conditioning.

Enhanced computational capabilities and numerical modeling are very important media and tools in constraining ideas, testing different (and possible) scenarios, but they are only useful platforms and tools; they cannot fully display the complexities of geological systems without the human interaction. As George Box said: "all models are wrong, some are useful." There is no doubt that geology in the field can be intellectually and physically challenging, at times daunting, but we cannot refrain from the field observations and ground truthing. Sedimentary geo-sciences cannot be compared to a pile of rice; as Francis Pettijohn said: "The field is where the truth resides; rocks do not lie".

Why SEPM?

The independent and innovative spirit of SEPM, and its inclusive structure, suggests that the Society for Sedimentary Geology is the best candidate to help coordinate the growth and future of our community. SEPM is an international not-for-profit society formed with the main goal to disseminate scientific information on Sedimentary Geo-sciences and it has been encouraging/fostering innovation and advancements in sedimentary geosciences since 1926. SEPM has no big donors, no ties to big private or government money. The revenues of the Society are membership fees, scientific journals (edited by volunteers), field conferences, and the participants' fees to Congresses like these. SEPM needs active participation and involvement of its members to continue its mission to disseminate and educate in sedimentary geology and all related fields.

The Opportunity: "Improve scientific basis to improve readiness"

While dealing with this pandemic, it became clear that our modern society does not cope well with changes. Sedimentary geoscientists are trained to detect and describe changes at the highest level! Everything we detect in the stratigraphic record is related to a change, chemical, physical, or a combination of the two at the strata boundaries. We think that, formation-wise, we might have an advantage when compared to other scientists; we see the world changing through the sedimentary

record. Like it or not, changes are looming on our horizon and will impact our lives, demanding clear responses and pointed action.

Of the planetary changes on the horizon, we think the upcoming climate crisis demands a communal preparedness. Two well documented North American examples straddling about a century of history comes to mind: The Great Mississippi flood of 1927 and Hurricane Katrina. Both events, of rivers and coastal disasters, caused human migrations at large scale (the Great Migration related to the Mississippi flood of 1927 redesigned the USA demographic) and eventual social crises still conflagrating nowadays; large population migrations do cause social unrest. Worldwide, monsoons have been causing humans migrations since we can remember; droughts have caused crops failure, human displacement, inequality, and civil wars. Unfortunately, the most vulnerable classes of society are the most impacted by these natural disasters. The partial solutions to these events did involve the engineering of nature rather than the understanding of it. Walls do not work! Cement won't help! Sedimentary geoscientists, the ones who truly grasp the importance of long term territory planning, seem to be barely involved.

The ISGC 2020 is meant to be a forum to kick off the discussions and forge a new path in the next century – The Past is the Key to the Future. The Congress has a program in place – if you were set to present, we encourage you to do so, modifying your abstract as you see fit. If you were not presenting, please consider submitting an abstract in light of this call to arms. If you feel the urge to do something that is not currently in the program, please propose a new session, workshop or short course! We are open to new additions to make this *the* meeting of 2021. Finally, if there is a push from our community, we see forming an ad hoc workshop at the end of the meeting (or beginning?) to specifically tackle problems.
Please contribute, be involved, and be part of the future of our community.

References:

Lucier, P., 2020, Can marketplace science be trusted? Nature, 574, p 481-485.