Theme A. Principles and methods

Methods, technology and new trends

The fate of formal lithostratigraphy

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Hollis D. Hedberg the first chairman of the ISSC after a long and successful activity has compiled and published the International Stratigraphic Guide with plenty of definitions, procedures, terminology and nomenclature among others with detailed information of 3 stratigraphic categories, including lithostratigraphy. In the definition of lithostratigraphic unit it was stated that "A lithostratigraphic unit may consist of sedimentary, or igneous, or metamorphic rocks, or an association of two or more of these." Salvador (1994) suggested alternative solution of the lithostratigraphic terminology under F4 subheading. It more obviously occurs in the North American and the Australian stratigraphic codes. The result is that national guides or codes and practice vary and the correlation of the lithostratigraphic units are unsolved which is expressed in the geological maps too. It is high time that the reconsideration of lithostratigraphic terminology was put on the agenda of the ISSC meeting.

Keywords: Lithostratigraphy, Terminology, International Stratigraphic Guide, National guides.

Sequence stratigraphy of continental rift basins.
I – A conceptual discussion of discrepant models

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Due to the asymmetry of the half-grabens and its subsidence controlled by one major boundary fault, within a rift basin the creation of accommodation space is variable; therefore, the traditional scheme of sequence stratigraphy is not applicable. The present paper discusses this, enhancing the controversy about the rift initiation: some authors defend that the onset of the rift is marked by rapid subsidence and huge accommodation; while others defend a slow subsidence regime and consequent low accommodation rates. This paper offers an integrative approach**,** based on the fact that the rift initiation is characterized by isolated and restricted fault which create incipient half-grabens. Towards the phase of rift climax, the initial rift faults tend to link, and form a larger and deeper depositional area, hence developing lacustrine facies with an overall retrogradational trend. So, in some parts of the basin the rift onset is characterized by fluvial sandstone, while the basal lacustrine mudstones found in other parts of the rift basin registers an already more advanced rift phase. When the rifting ends, accomodation rate decreases and the sedimentation regime will be progradational, and the rift basin is filled with fluvial, deltaic and eolian facies.

Keywords: rift basin, sequence stratigraphy, conceptual models.

Sequence stratigraphy of continental rift basins.
II – An example from the Brazilian Cretaceous Recôncavo Basin

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Since the early 1990s, several comprehensive and sometimes conflicting models of rift basin sequence stratigraphy have appeared, and conceptual ideas are especially contradictory when dealing with the rift initiation and its stratigraphic record. The present paper, using as an example the Recôncavo Basin (Brazil), shows that rift initiation is characterized by isolated and restricted fault which create incipient half-grabens, infilled with fluvial and deltaic facies. Towards the phase of rift climax, the initial rift faults tend to link, and form a larger and deeper depositional area, recording lacustrine facies with an overall retrogradational trend. Hence, locally restricted fluvial sandstone at the base of the stratigraphic succession record the onset of the rift phase, while the basal lacustrine mudstones found in other parts of the rift basin registers a already more advanced rift phase. When the rifting ends, accommodation rate decreases, the sedimentation regime is progradational, and the rift basin is filled with fluvial, deltaic and eolian facies.

Keywords: rift basin, sequence stratigraphy, Reconcavo Basin, Brazil.

The Triassic timescale 2013

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The current Triassic chronostratigraphic scale is a hierarchy of three series (Lower, Middle, Upper) divided into seven stages (Lower =Induan, Olenekian; Middle = Anisian, Ladinian and Upper = Carnian, Norian, Rhaetian), further divided into 15 substages (Induan = upper Griesbachian, Dienerian; Olenekian = Smithian, Spathian; Anisian = Aegean, Bithynian, Pelsonian, Illyrian; Ladinian = Fassanian, Longobardian; Carnian = Julian, Tuvalian; Norian = Lacian, Alaunian, Sevatian). Ammonoid and conodont biostratigraphies provide the primary basis for the chronostratigraphy. We argue here for reliance on ammonoid-based biostratigraphy for Triassic chronostratigraphic definitions. We advocate a four-stage Lower Triassic and elevation of the very long Carnian and Norian stages to series. A sparse but growing database of precise radioisotopic ages supports the following calibrations: base of Triassic ~ 252 Ma, base Olenekian ~ 251 Ma, base Anisian ~ 247 Ma, base Ladinian ~ 242 Ma, base Norian ~ 221 Ma, base Jurassic ~ 201 Ma. Triassic magnetostratigraphy is a series of multichrons at best, and needs vast improvement to make a serious contribution to the Triassic timescale.

Keywords: Triassic, timescale, chronostratigraphy, numerical ages, magnetostratigraphy.