
Geospheres; Investigators at University of Texas Austin Describe Findings in Geospheres (Giant Meandering Channel Evolution, Campos Deep-water Salt Basin, Brazil)

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2022 JAN 7 (NewsRx) -- By a News Reporter-Staff News Editor at Science Letter -- Investigators publish new report on Geospheres. According to news reporting originating from Austin, Texas, by NewsRx correspondents, research stated, "Submarine channels are conduits for sediment delivery to continental margins, and channel deposits can be sandy components of the fill in tectonically active salt basins. Examples of salt-withdrawal basin fill commonly show successions of sandy channelized or sheet-like systems alternating with more mud-rich mass-transport complexes and hemipelagites."

Financial support for this research came from University of Texas at Austin **Bureau of Economic Geology** (UT-Austin BEG) Quantitative Clastics Laboratory (QCL).

Our news editors obtained a quote from the research from the University of Texas Austin, "This alternation of depositional styles is controlled by subsidence and sediment-supply histories. Salt-basin fill comprising successions of largely uninterrupted meandering-channel deposition are less commonly recognized. This begs the questions: can sediment supply be large enough to overwhelm basin subsidence and result in a thick succession of channel deposits, and, if so, how would such a channel system evolve? Here, we use three-dimensional seismic-reflection data from a >1500 km² region with salt-influenced topography in the Campos Basin, offshore Brazil, to evaluate the influence of salt diapirs on an Upper Cretaceous-Paleogene giant meandering submarine-channel system (channel elements >1 km wide; meander wavelengths several kilometers to >10 km). The large scale of the channels in the Campos Basin suggests that sediment discharge was large enough to sustain the meandering channel system in spite of large variability in subsidence across the region. We interpreted 22 channel centerlines to reconstruct the detailed kinematic evolution of this depositional system; this level of detail is akin to that of recent studies of meandering fluvial channels in time-lapse Landsat satellite images. The oldest channel elements are farther from salt diapirs than many of the younger ones; the centerlines of the older channel elements exhibit a correlation between curvature and migration rate, and a spatial delay between locations of peak curvature and maximum migration distance, similar to that observed in rivers. As many of the younger channel centerlines expanded toward nearby salt diapirs, their migration pattern switched to downstream translation as a result of partial confinement. Channel segments that docked against salt diapirs became less mobile, and, as a result, they do not show a correlation between curvature and migration rate. The channel migration pattern in the Campos Basin is different compared to that of a tectonically quiescent continental rise where meander evolution is unobstructed. This style of channelized basin filling is different from that of many existing examples of salt-withdrawal minibasins that are dominated by overall less-channelized deposits. This difference might be a result of the delivery of voluminous coarse sediment and high discharge of channel-forming turbidity currents to the Campos Basin from rivers draining actively uplifting coastal mountains of southeastern Brazil."

According to the news editors, the research concluded: "Detailed kinematic analysis of such well-preserved channels can be used to reconstruct the impact of structural deformation on basin fill."

For more information on this research see: Giant Meandering Channel Evolution, Campos Deep-water Salt Basin, Brazil. Geosphere, 2021;17(6):1869-1889. Geosphere can be contacted at: Geological Soc Amer, Inc, PO Box 9140, Boulder, CO 80301-9140, USA.

The news editors report that additional information may be obtained by contacting Jacob A. Covault, University of Texas Austin, Jackson School of Geosciences, Bur Econ Geol, Austin, TX 78713, United States. Additional authors for this research include Zoltan Sylvester, Can Ceyhan and Dallas B. Dunlap.

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