

Sedimentology from Low Earth Orbit – How Time-lapse Earth Motion from Remote Sensing Imagery Aids Reservoir Characterization and Challenges Static Depositional Paradigms.

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Summary

The accessibility of open source and commercially available satellite imagery has increased substantially, allowing earth science professionals and the public to view geomorphological features from new perspectives. The progressively large database of georeferenced imagery gives geoscientists the capability to study multi-decadal earth processes, allowing it unfold as time-lapse motion at a variety of temporal and spatial scales.

The dynamic nature of fluvial and coastal depositional systems can be difficult to conceptualize solely relying on data provided by static imagery and field studies alone. The authors demonstrate how time-lapse imagery products provide insights into the predictive capability of observations derived from this dynamic dataset. Applications discussed include the utility towards planning and emergency management of fluvial flooding and coastal erosion hazards, as well as the frequency of such events and their impact.

Time-lapse imagery can also provide a better conceptualization of both oil and gas reservoir models and groundwater aquifer models. Mapping reservoirs and aquifers often relies on often overly simplified depositional models constructed from environments derived from singular or static data. Insight and perceptions derived from time-lapse remotely-sensed data challenge some commonly held reservoir interpretations from a sedimentological process standpoint, such as the preservation of barrier islands and fluvial channels in the rock record.