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South East Asia and Middle East Geologic Formation Databases with Visualizations on Plate Reconstructions

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In a successful collaboration with numerous regional experts on the stratigraphy of Southeast Asia and the Middle East, our international team developed cloud-based stratigraphic lexicons with graphical user-interfaces. These databases consist of the Indian Plate (*indplex.geolex.org)* of nearly 1000 onshore and offshore sedimentary and volcanic formations across India, Pakistan, Nepal, Bhutan, Sri Lanka, Bangladesh, and Myanmar, of southeast Asian regions (*chinalex.geolex.org; thailex.geolex.org; vietlex.geolex.org; japanlex.geolex.org)* with ca. 5000 formations as of January 2024), and of Middle East regions (*mideastlex.geolex.org; qatarlex.geolex.org*). The entries for each formation contain details on the succession of lithology, as well as the fossils present, age range, regional distribution and associated images. APIs enable easy access and integration with other applications. A comprehensive search system allows users to retrieve information on all geologic formations for a specific date or geologic stage from multiple databases. The cloud-based databases and websites can be explored through user-friendly map and stratigraphic-column interfaces generated from *TimeScale Creator* software.

Regional extents of each formation in GeoJSON format enables visualization as facies-pattern-filled polygons projected onto three proposed plate reconstructions of its corresponding time interval; or as time slices of regional paleogeography. These lexicon systems will be interlinked to other stratigraphic and paleogeographic databases through the lUGS Deep-Time Digital Earth platform. This comprehensive approach allows one better comprehend deep-time dynamics and gain

valuable insights into the evolution of the different regions of our planet Earth.