



Plio-Quaternary coastal sequences, sea-level changes and coastal geodynamics :

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Sequences of Plio-Quaternary shorelines generated by sea-level cyclicity and tectonics massively shape the coasts worldwide. Here, we compile a worldwide synthesis of sea-level changes for the following highstands : MIS 1, MIS 3, MIS5e, and MIS 11 and explore the relationships to regional geodynamics. We identified 896 sequences including the MIS 5e benchmark, out of which 177 also feature the highest Holocene shorelines, 6 where the elevation of the MIS 3 shorelines are known, and 40 including that of MIS 11 shorelines. We considered 8 main geodynamical contexts for a statistical analysis: passive margin (337 sites, 14 domains, $U=0.06 \pm 0.01$ mm/a), hot spot chains (45 sites, 14 domains, $U=0.02 \pm 0.02$ mm/a), rifts (45 sites, 2 domains, $U=0.12 \pm 0.02$ mm/a), ridges (3 sites, 1 domain, $U=0.14 \pm 0.02$ mm/a), transform plate boundaries (119 sites, 7 domains, $U=0.25 \pm 0.03$ mm/a), intra-oceanic subductions (131 sites, 4 domains, $U=0.43 \pm 0.04$ mm/a), continental subductions underneath oceanic plates (12 sites, 1 domain, $U=0.54 \pm 0.04$ mm/a), oceanic subductions underneath continental plates (166 sites, 7 domains, $U=0.06 \pm 0.01$ mm/a), intra-continental convergence (10 sites, 2 domains, $U=1.47 \pm 0.08$ mm/a). Counter-intuitive is the fact that passive margin are ubiquitously uplifting, while tectonic segmentation is more important on active margins. Additionally, 511 sites document the elevation of the highest shoreline of the sequence, from which we extrapolate a minimum age of onset for the sequence (based on MIS 5e uplift rates). 99% (511 sites) were formed at least during Pliocene and/or Quaternary, showing that potentially more ancient records are either eroded or non-existent.