"Hotspots" for carbon burial in the coastal margin: Linkages with watersheds in the Anthropocene

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Approximately 90% of the organic carbon (OC) in oceans in buried in the contiental margin. In particular, continental shelf regions bury about 40% in deltas, 47% in non-deltaic regions, and 12% in fjords. In particular, sediments in large-river delta-front estuaries (LDE) have been shown to be repositories and integrators of land-use change across expansive watersheds that drain the continents to the ocean. Similalry, fjords have store considrebly large amounts of carbon, particulalry with respect to their relativly small global surface area. Molecular biomarkers of OC (e.g., lignin phenols, fatty acids, sterols) in LDE sediments have been used extensively to reconstruct of carbon cycling changes that are reflective of land-use change in the watersheds. However, due to the highly variable hydrologic regimes across continents, continental margins (e.g., active versus passive), and coastal dynamics in LDEs and fjords the fate and transport of these molecular biomarkers varies considerably. Here, I will compare and contrast some of the key molecular biomarkers that have been used to date in such historical reconstruction exercises in very divergent coastal systems, LDEs and fjords, and explore how margin-type, residence time of transport, reservoir dams, redox, priming effects, and molecular stability, to name a few, impact the utility of using different biomarkers in coastal paleo-reconstruction studies.