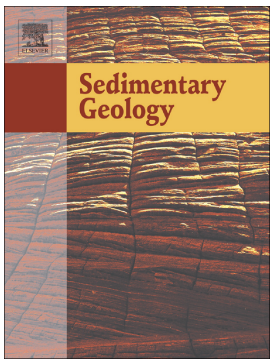

Bayhead Deltas and Shorelines: Insights from Modern and Ancient Examples

Alexander R. Simms, Antonio B. Rodriguez, John B. Anderson

PII: S0037-0738(18)30171-4
DOI: doi:10.1016/j.sedgeo.2018.07.004
Reference: SEDGEO 5370

To appear in: *Sedimentary Geology*

Received date: 16 May 2018
Revised date: 17 July 2018
Accepted date: 19 July 2018

Please cite this article as: Alexander R. Simms, Antonio B. Rodriguez, John B. Anderson , Bayhead Deltas and Shorelines: Insights from Modern and Ancient Examples. Sedgeo (2018), doi:10.1016/j.sedgeo.2018.07.004

Bayhead Deltas and Shorelines: Insights from Modern and Ancient Examples

Alexander R. Simms[1], Antonio B. Rodriguez[2], John B. Anderson[3]

[1]Department of Earth Science, University of California Santa Barbara, 1006 Webb Hall, Santa Barbara, CA 93106, U.S.A., email: asimms@geol.ucsb.edu

[2]Institute of Marine Sciences, University of North Carolina, Chapel Hill, 3431 Arendell St., Morehead City, NC 28557, U.S.A., email: abrodrig@email.unc.edu

[3]Department of Earth Sciences, Rice University, 6100 S. Main, Houston, Texas 77005, email: johna@rice.edu

Abstract

Bayhead deltas are important components of the rock record as well as modern estuaries, hosting important hydrocarbon reservoirs and many coastal cities, ports and large expanses of wetlands. Despite their significance, few studies have summarized their occurrence and sedimentary characteristics. In this paper we review the stratigraphic, sedimentary, and geomorphic characteristics of 68 modern and ancient bayhead deltas. Bayhead deltas are found in incised valleys, structural basins, fjords, interdistributary bays of larger open-ocean deltas, and other backbarrier environments. Except for within fjords, they generally prograde into shallower and more brackish waters than their open-ocean equivalents. As a result, 80% of modern, 68% of Quaternary, and 67% of ancient bayhead deltas have clinoform thicknesses of 10 m or less with 73% of modern bayhead deltas having clinoform thicknesses of 5 m or less. Additionally, 89% of modern, 81% of Quaternary, and 77% of ancient bayhead deltas examined are fluvial dominated. We distinguish true bayhead deltas from their genetically similar bayhead shorelines, which are not constructional features but sites of enhanced marsh or estuarine sedimentation near river mouths with inadequate rates of sediment delivery to form distributary channels and prograde into the estuary or lagoon. We also distinguish confined bayhead deltas found in incised valleys, structural basins, and fjords from unconfined bayhead deltas found as incipient lobes of larger delta complexes and other