

# GLOBAL CONTROLS OF BARRIER ISLAND CHAIN MORPHOLOGY AND DISTRIBUTION

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## ABSTRACT

This is a reconnaissance study of the morphology and distribution of barrier island chains around the world. Information was obtained primarily from maps and charts. Five hundred thirty islands and spits compose the 74 chains which are the basis of this study. A chain is defined as consisting of a minimum of three islands, two islands and a spit, or two spits and an island. Barrier island chain lengths range from less than 12 mi (20 km) to more than 435 mi (700 km). Both long and short chains occur on trailing edge and marginal sea margins, while collision coasts bear short chains only. Most chains are composed of fewer than 10 islands each. Of the three major tectonic coastal types, marginal seas are most susceptible to barrier island chain formation, followed by trailing edge margins, then by collision coasts. Chains on collision coasts are usually at the mouths of estuaries or fringing small deltas. Twelve percent of all barrier chains are located in areas of pack ice. Only 2.2% of the world's coasts are fronted with barrier island chains, a much smaller percentage than previous estimates. This difference is probably due to differing definitions of barrier islands.

Chains are found adjacent to both steeply dipping (e.g., Taiwan) and gently dipping (e.g., Yellow Sea) continental shelves. Not surprisingly, shoreface slopes appear to be a function of wave energy; the higher the wave energy the steeper the slope. Pack ice islands are characterized by unusually flat shorefaces and very wide inlets, both probably reflecting the lack of year round wave energy. The length of individual islands appears to be inversely related to both tidal amplitude and coastal plain slope. Lagoonal width is largely controlled by coastal plain slope; the largest lagoons are on the flattest slopes. The variable quality of the maps used in this study was its major shortcoming. The next step in global barrier island chain studies should involve satellite imagery.

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