

ID: W2912245046

TITLE: Delta Winners and Losers in the Anthropocene

AUTHOR: ['John W. Day', 'R. Ramesh', 'Livia Giosan', 'James P. M. Syvitski', 'G. Paul Kemp']

ABSTRACT:

Deltas are the most productive and economically important global ecosystems, associated with some of the largest coastal marine fisheries and the majority of global coastal wetlands. They are often regions of intense economic activity. Because of their ecological richness, deltas support the highest values of ecosystem goods and services in the world. We synthesize information presented on deltas in this book and elsewhere and discuss how individual deltas will fare given the given global megatrends of the 21st century. Deltas formed over the past several thousand years after sea level stabilization following the end of the last glacial epoch during a period of relatively stable sea level, predictable and regular input from drainage basins, and a high degree of interaction within its hinterland, drainage basins, river channels, the deltaic plain, and the coastal ocean. The functioning and sustainability of deltas depend on regular and episodic, external and internal, inputs of energy and materials that produce benefits over different spatial and temporal scales. Deltas are among the most threatened coastal ecosystems because human impacts have fundamentally changed the environmental setting of deltas. Deltaic sustainability can be considered from geomorphic, ecological, and economic perspectives. Here we build on earlier work to examine the sustainability of a subset of deltas presented in this book. Roughly running from less to more sustainable are deltas in arid environments, deltas with highly energy-intensive management and flood defense systems, deltas with significant areas below sea level, arctic deltas, tropical and subtropical deltas with growing human impact, deltas with relatively low energy management, and tropical deltas with relatively low human impact and high freshwater input. Using the database and approach of Giosan and colleagues, we consider the sustainability trajectory of individual delta given their ability to survive sea level with changing sediment input and environmental setting. Deltas with increasing aridity will likely cease to function as deltaic systems. Large deltas with sufficient freshwater input will lose wetlands and become dominated by large expanses of shallow water in a process of estuarization.

SOURCE: Elsevier eBooks

PDF URL: None

CITED BY COUNT: 8

PUBLICATION YEAR: 2019

TYPE: book-chapter

CONCEPTS: ['Delta', 'River delta', 'Anthropocene', 'Geography', 'Sustainability', 'Ecosystem', 'Wetland', 'Oceanography', 'Environmental resource management', 'Geology', 'Environmental science', 'Ecology', 'Aerospace engineering', 'Engineering', 'Paleontology', 'Biology']