

BOOK REVIEW

FORMATION, EVOLUTION AND STABILITY OF COASTAL CLIFFS

– **STATUS AND TRENDS** by M.A. Hampton and G.B. Griggs (Eds.)

Professional Paper 1693, U.S. Geological Survey, Washington D.C., 123p.

Coastal cliffs typically originate by marine or lacustrine processes, though in a majority of cases, by the former. It is surprising to learn that the coastal cliff, a steeply sloping or almost vertical surface between the elevated land and the shoreline, occurs almost along 80 per cent of the world's shorelines. In India, however, it is not likely to be even 40 per cent as a large section of the east coast is a depositional coast and the same is the case in parts of west coast in Kerala, Karnataka and Gujarat.

This landform is a target for continuous attack by waves and currents, but the degree of damage varies depending upon primarily on the material constituent of the cliff (hard rock, soft rock or unconsolidated sediment/debris) and its orientation to the attacking forces, besides tectonic stability of the region. Cliff and beach erosion attracts attention only if it causes continuous damage to property (buildings or hutments) and recreation facilities already made along the wave front.

The eight papers in the volume discuss about the processes that operate, the methodology to be adopted to study and interpret their effect and possible solutions to mitigate their deleterious effects. All the examples cited are from USA only.

There is no single solution to the problem of cliff and/or beach erosion. In some cases revetments or sea walls are recommended and in some, replenishing or nourishing with concrete structures (tetrapods) and boulders. In some, if the remedy is not curative, abandonment of the area is advised from any other human activity. It is not as if it is always a losing war against the onslaught of the natural elements at work in this theatre. A detailed collection of data on the

processes operating (pp. 7-38) namely, changes in water level, nature of currents and waves, effect of out-flowing terrestrial water, weathering of the material, diurnal changes in climate, stability of slopes based on the lithology and attitude, aid in putting across the problem to the engineers and for them to evolve appropriate solutions. Another paper (pp.39-50) discusses in detail the field methods to be adopted in measurement of the retreat of the coastal cliffs and bluffs using historical maps, aerial photographs, digital stereophotogrammetry and GIS. The relative advantages and disadvantages of the measurement techniques are also well tabulated. About four papers (pp. 53-105) describe and discuss case histories along the east and west coasts of the United States and the last one (pp. 107-123) deals with the erosion of the coastal bluffs in the Great Lakes region, the type of which is not met with elsewhere in the world, in such magnitude.

The overall presentation of the studies with the aid of excellent photographs, maps, schematic diagrams, graphs and profiles enhance the value of this publication. With a coastline of about 7500 km in our country, there is a need for similar studies to be made for more effective use of the available technology and appropriate measures to be taken to tackle the problem of coastal erosion in some parts of our country and this publication will be felt quite useful for those involved in this problem.

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