Shoreline Erosion along Chesapeake Bay's Calvert Cliffs: Friend or Foe?

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Unique along the thousands of km of low-relief tidewater shoreline of the U.S. Mid-Atlantic/Gulf coasts, a 40 km long line of seacliffs forms the western edge of the central Chesapeake Bay. These "Cliffs of Calvert" are carved into semi-consolidated, fossiliferous marine silt/clay of Miocene age. The marine strata dip toward the south, exposing the oldest units at the base of the cliffs in the north (20 mill. yr) and the youngest units at the cliff tops in the south (10 mill. yr). In the central and southern cliffs the marine strata are capped by non-marine fluvial sands/gravels. At a few sites the Calvert Cliffs are interrupted by barrier beach-saltmarsh-tidal stream systems, most of which have been developed as recreational marinas. The Parkers Creek segment of the Calvert Cliffs is unique because cliffs, beaches, saltmarsh, tidal stream, swamp and xeric upland forests -- in all a Chesapeake microcosm -- still remain together in a nearly pristine state. The eroding Calvert cliffs represent at once 1) a scenic landmark, 2) a shoreline ecotome supporting a diverse biota, including two endangered tiger beetle species, 3) a magnet for amateur fossil hunters and educational field trips, 4) a paleontological record of the middle Miocene unexcelled in the Western Hemisphere and 5) a place for Bayshore recreation.

To maintain these values, however, the cliffs must be allowed to retreat at their natural rates which is generally perceived as undesirable on account of real estate losses and, to a lesser extent, contributions to estuarine siltation. Nevertheless, cliff erosion predates the Chesapeake's environmental problems, and the very beach sand which helps protect the cliffs from frequent wave attack is itself a residue of cliff erosion. Because much of the Calvert cliffs shoreline has already been developed, diverse shoreline erosion control structures have been emplaced, locally modifying or destroying the cliffs as a natural feature. Pressure continues for additional control measures. Resolving the conflict between preserving the Calvert Cliffs as a naturally eroding landmark vs. arresting cliff retreat at great cost to protect man-made structures is a major challenge to environmental management and state/local government land use policy. Resolution must emphasize 1) a combination of setback criteria and erosion control in developed areas; and 2) preservation of remaining naturally eroding cliffs through a combination of techniques, such as government purchase as parkland, downzoning, sale of development rights and easement donation. Local and national land trusts can assist governments and play a major role in cliff preservation and environmental management.