

HOLOCENE DEPOSITIONAL ENVIRONEMENTS  
OF THE GLACIAL OUTWASH PLAIN SHORELINE  
OF THE NORTHEAST GULF OF ALASKA

By

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ABSTRACT

The morphology and sediments of the entire glacial outwash plain shoreline of the northeast Gulf of Alaska (Cordova to Icy Point) were studied on a reconnaissance basis in 1969-71. Fifteen permanent beach profiles were established, eighteen detailed site studies (zonal studies) were carried out, and sediment samples were collected at ninety stations, using a 4 km spacing. The following general conclusions are derived from this study:

- 1) Coastal morphology of the area consists of:
  - a) areas where outwash streams border the coast,
  - b) beach-ridge plains located downdrift of the outwash streams, and
  - c) the delta of the Copper River.

Depositional models have been defined for each of these morphological types.

- 2) Southeasterly storms dominate the coastal processes, generating strong littoral drift from east to west (as indicated by beach morphology, grain size trends, and limited field measurements).
- 3) Recent earthquake activity has left a major imprint on the shoreline morphology, especially in bedrock areas, where uplifted wave-cut benches are well preserved.

4) Beach morphology:

- a) The large diurnal inequality of the tides has a striking effect on beach morphology, inasmuch as wave energy is focused at four different levels on the beach during a single tidal cycle.
- b) Beach face slopes show great differences which correlate with grain size differences, the coarsest beaches having the steepest slopes.
- c) The erosional-depositional cycle on the beach closely follows the one described for the East Coast of the U. S. The cycle is initiated by a storm which leaves a flat, erosional profile. The recovery profile consists of landward-migrating ridge-and-runnel systems, and the mature profile consists of a wide, constructional berm. Storms are more numerous in Alaska, so the frequency of completion of the cycle is less than on the East Coast.