Aerial photo taken in 1986 at a scale of 1:4,800.


**Maine Geological Survey**

**Address:** 22 State House Station
Augusta, Maine 04333
**Telephone:** 207-287-2801
**E-mail:** mgs@maine.gov

**Home page:** http://www.maine.gov/doc/nrimc/nrimc.htm


See back for description of map units.

# Beach and Dune Geology

## Old Orchard Beach, East Grand Ave. Old Orchard Beach, Maine


**by Stephen M. Dickson**



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# *Coastal Sand Dune Environments*

## DUNES

**D1** **Frontal Dunes** - The most seaward ridge of sand in the sand dune system. The frontal dune may or may not be naturally vegetated with plants such as American beach grass (*Ammophila breviligulata*). The frontal dune may consist in part, or in whole, of artificial fill. In areas where smaller ridges of sand are forming in front of an established dune ridge, the frontal dune may include more than one ridge. Includes former frontal dune areas modified by development. Where the dune has been modified by structures, the dune position may be inferred from the present beach profile, dune positions along the shore, and regional trends in dune width.

**D2** **Back Dunes** - Sand dunes or sand flats that lie landward of the frontal dune or a low-energy beach. Back dunes include those areas containing fill over back dune sand or over wetlands adjacent to the sand dune system.

**D3** **Back Dune Washover Fan** - A small delta-like feature or fan that is built in a pond, on a salt marsh, or on a back dune when the sea breaches a frontal dune ridge and invades the landward side of the dunes during severe storms with high waves and tides.

## BEACHES

**B1** **Sand Beach** - An accumulation of sandy sediment that is defined on the landward side by the extent of storm wave action. Storm waves may also reach into the dunes at some locations. On this photo the seaward beach margin is arbitrarily placed offshore near the middle to low-tide position, although the area of wave influence extends farther seaward. Sand grains are less than 2 millimeters (0.08 inches) in diameter. The beach environment includes all berms, a temporary accumulation of sediment near the high-tide elevation.

**B2** **Sand and Gravel Beach** - Beach consisting of a mixture of sand and gravel (greater than 2 mm, 0.08 in.). Commonly, the dominant grain size changes with either beach elevation or position along shore due to physical sorting by waves.

**B3** **Gravel Beach** - Beach with most abundant grains greater than 2 mm, 0.08 in.).

**B4** **Boulder Beach** - Gravel beach which includes boulders (greater than 25 cm, 10 in.).

**B5** **Low-Energy Beach** - Beach sheltered from direct wave approach by land, extensive intertidal shoals, or coastal engineering structures. Low energy beaches contain a variety of grain sizes and are commonly found along tidal inlets adjacent to ocean-facing, high-energy beaches (B1-B4).

## CHANNELS

**C1** **Tidal Channel** - Subtidal and intertidal channels with varying water depths and currents influenced by the ebb and flood of tides.

**C2** **Dredged Channel** - Tidal channel which has had sediment and/or rock removed from underwater locations in order to create a navigable channel or basin.

**C3** **Channel Bar, Tidal Delta** - Sedimentary deposits of variable grain size in and adjacent to tidal channels. Flood-tidal deltas are common on the landward side of inlets in the sand dune system where the channel widens.

**C4** **Supratidal Channel** - Channels above the high-tide line that lead to intertidal elevations. Supratidal channels carry freshwater flow and may be ephemeral.

## COASTAL WETLANDS AND SHOALS

**M1** **High Salt Marsh** - Tidal wetlands dominated by salt meadow hay (*Spartina patens*) which fringe the edges of estuaries. Sediments are predominantly a mix of mud, sand, and peat. The elevation of high salt marshes is approximately mean high water.

**M2** **Low Salt Marsh** - Tidal wetlands dominated by saltwater cordgrass (*Spartina alterniflora*) which fringe the edges of estuaries. The elevation of low salt marshes ranges from mean sea level to mean high water. Sediments are predominantly mud and sand.

**M3** **Freshwater Marsh** - Areas with hydric soils and water-tolerant vegetation which are frequently inundated or saturated by low salinity surface or ground water .

**P1** **Freshwater Pond** - A natural body of standing fresh water occupying a small surface depression.

**L1** **Ledge** - Intertidal and subtidal outcrops of resistant rock with little or no sediment cover

## COASTAL ENGINEERING AND UPLANDS

**H1** **Coastal Engineering Structure/Fill** - Built structures such as jetties and bridges, some of which are located in the sand dune system.

**H2** **Glacial/Bedrock Highlands** - Glacial sediment deposits or bedrock exposures that are generally elevated and stand above adjacent sand dune areas.

**Note:** Road names from U.S. Census Bureau TIGER/Line data. Please contact the Maine Geological Survey with any corrections.