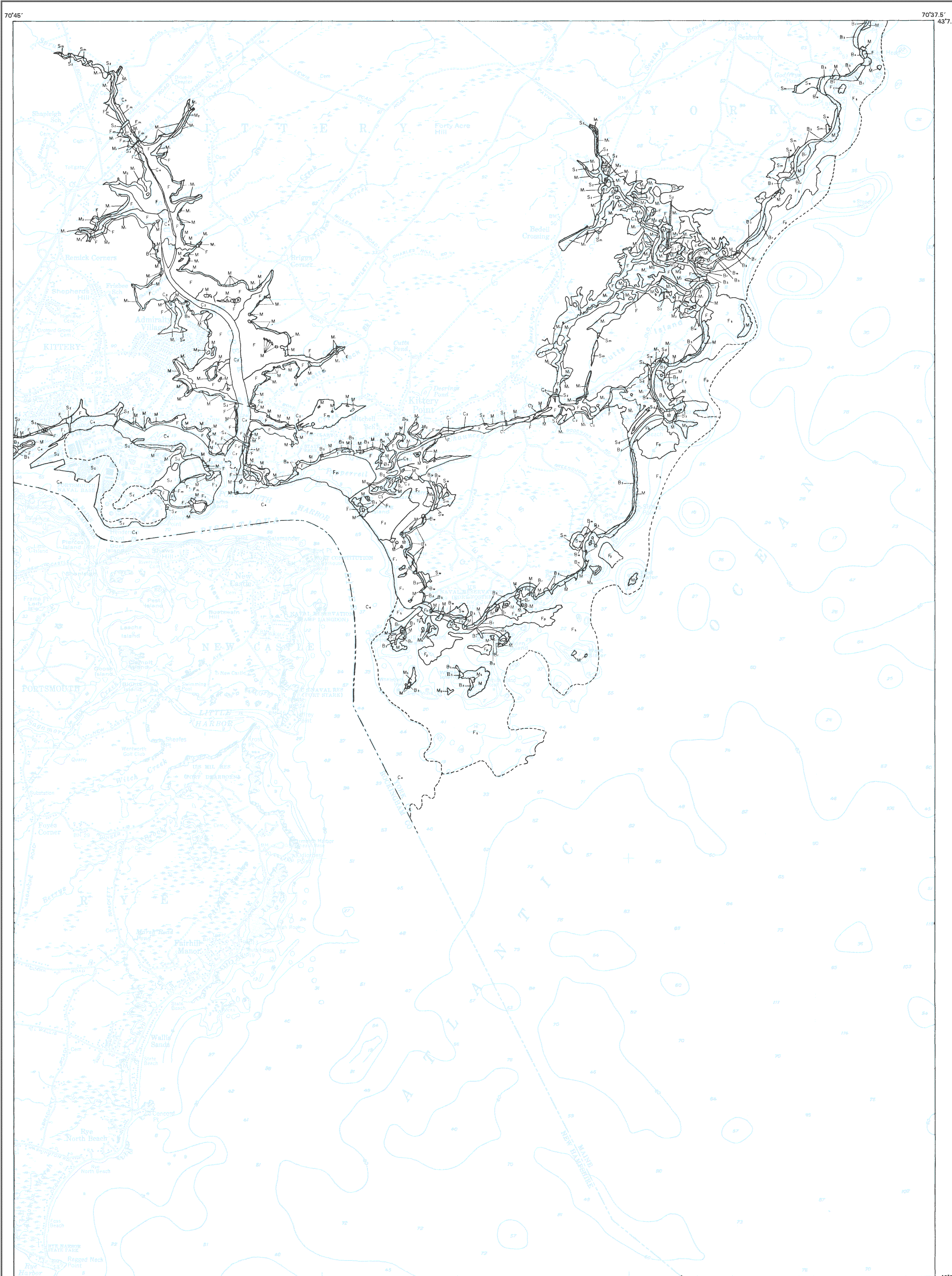




KITTERY QUADRANGLE, MAINE

By

BARRY S. TIMSON
1976

Maine Geological Survey

DEPARTMENT OF CONSERVATION

Augusta, Maine 04333

Walter A. Anderson, State Geologist

OPEN-FILE NO. 76-101

Quadrangle Location

SUPRATIDAL ENVIRONMENTS

Environments just above the highest high water datum, but under the partial influence of marine processes and forces.

Sd Dunes and Vegetated Beach Ridges

Unconsolidated sand or gravel deposits capping beach environments. Dunes are subject to storm waves and winds, while gravel beach ridges are subject only to storm wash. Each may be vegetated with salt-tolerant vegetation.

Sw Fresh-Brackish Water

Ponded water behind beach ridges, man-made constrictions on former tidal embayments, or on marsh surfaces transitional between upland and salt marsh environments. Salinity of the water is less than 5 parts per thousand (ppt).

Sm

Fresh-Brackish Marsh

Water-saturated, organic-rich sediments characterized by broad-leaved vegetation tolerant of constant submergence in fresh water. Salinity of interstitial water is less than 5 ppt.

Sz

Man-Made Land

Structures or fill emplaced by man in the nearshore environment.

Sx

Landslide Excavation and Deposits

Natural excavation into shoreline upland slopes created by large-scale slumping or sliding of bank material and the resulting deposits at the base of the slopes.

Se

Eolian Flat

Partially vegetated sand flats adjacent to dune fields. Subject to generally northwest winds and occasional storm flooding.

Sf

Washover Flat

Sand deposits covering salt marshes behind inlet mouths which originate from storm washover or inlet delta deposits on salt marshes. Subject to storm washover and spring tide flooding.

Sr

Fluvial Marsh

Vegetated river floodplain and bank environments. Characterized by freshwater pond vegetation such as pond lilies, reeds, and wild rice. Subject to daily tidal flooding as well as inundation during high river discharge periods.

INTERTIDAL ENVIRONMENTS

Environments between the highest high water datum and the lowest low water datum subject to twice daily tidal flooding and all other marine forces.

Marsh Environments

Vegetated environments or isolated depressions within vegetated environments located above mean tide level in protected coastal areas.

M1

High Salt Marsh

Organic-rich sediments densely vegetated primarily with the salt marsh grass *Spartina patens* (salt-meadow grass). High salt marshes are at the same level as mean high water.**M2**

Low Salt Marsh

Mud or muddy sand embankments sparsely to densely vegetated by the salt marsh grass *Spartina alterniflora* (salt cord-grass). Low salt marsh exists between mean tide level and mean high water.**M3**

Marsh Levee

Channel-margin sediments vegetated with salt-meadow grass which exist up to several tens of centimeters above the salt marsh surface. The marsh levee consists of sandy silt or silt-size sediment deposited from flood waters rising above channel margins, either from high river discharge into estuarine embayments or from storm-surge influenced flood tides from the ocean.

M4

Salt Pannes and Salt Ponds

Salt-water filled, non-vegetated depressions on the high salt marsh surface (salt pannes) or salt-water filled depressions anywhere in the intertidal zone (i.e. tidal pools). Salt pannes may be dry and covered with algae during late summer months.

B5

Low-Energy Beach

Beaches consisting of a wide variety of sediment sizes which are protected from high wave energy. Sediment characteristics are dependent upon sediment source, which is usually from upland scarps immediately shoreward of the beach. Low-energy beaches may exhibit growth of salt marsh grass when there is little sediment movement.

Br

Boulder Ramp

Sloping surfaces in the lower intertidal zone veneered by large boulders. This environment is seaward of gravel or boulder beaches on high wave energy shorelines. Boulders are remnant lag deposits of eroded glacial till. Boulder movement is limited to periods of intense storm wave activity.

Bw

Washover Fan

Fan-shaped deposits of gravel located behind gravel beach ridges and covering portions of marshes. Few washovers have been recognized as mappable units on sand beaches. Washover fans are deposited by storm waves. Fan sediment is derived from the beach itself.

Ba

Spits

Partially-submerged beach ridges which extend offshore into open water. This category includes tombolos (spits joining an island with the mainland).

F3

Mussel Bar

Low mounds of living mussels, *Mytilus edulis*, and/or disarticulated and broken mussel shells accumulated by wave shoaling. Mussel bars generally occur at the mouths of estuaries or embayments at tidal channel margins where nutrient-laden oceanic waters first flood flat environments. Mussel bars accumulate on intertidal flats.**F4**

Channel Levee

Linear accumulations of sediment along margins of tidal channels built several tens of centimeters above the surrounding intertidal flats. Channel levees are constructed from sediment deposited on the flat as the tide rises above the channel margins.

F5

Algal Flats

High, coarse and fine-grained intertidal flats covered with the green algae, *Enteromorpha erecta*.**F6**

Veneered Ramp

Former boulder ramps presently covered by fine-grained sediment settling out of the water column.

Miscellaneous Environment

M

Ledge

Subaerially or subaqueously exposed bedrock.

Mc

Fluvial-Estuarine Channel

Transitional channel between river and estuarine channels. The fluvial, tidal fluvial, or estuarine state depends upon the volume of river discharge entering the estuarine basin.

mp

Point or Lateral Bars

Accumulations of sediment adjacent to intertidal channel margins at channel bends (point bars) or along straight segments (lateral bars).

ms

Swash Bars

Accumulations of sediment which occur where waves shoal onto intertidal flats.

mf

Flood-Tidal Delta

Lobate bars of sediment which accumulate landward of an inlet separating a back-barrier estuary or lagoon from open-ocean water.

me

Ebb-Tidal Delta

Lobate bars of sediment which accumulate seaward of an inlet separating a back-barrier estuary or lagoon from open-ocean water.

md

Fan Delta

Coarse-grained, fan-shaped deposits which accumulate on intertidal flats where upland streams drain onto high tidal-range shorelines.

mi

Spillover Lobes

Lobate bars of sediment which extend from flood-tidal deltas into estuarine or tidal channel areas.

SUBTIDAL ENVIRONMENTS

Environments existing below lowest low water and subject to tidal current forces and wave-generated current forces.

Flat Environments

Submerged, gently sloping, or level environments composed primarily of fine sand, silt, and clay. Includes subaqueous exposures of coarse-grained, Pleistocene glacial sediments.

Fm

Mud Flat

Fine-grained subtidal flats.

Fc

Coarse-Grained Flat

Coarse-grained subtidal flats.

Fe

Eelgrass Flat

Fine-grained and coarse-grained, shallow subtidal (low intertidal) flats which support dense stands of eelgrass (*Zostera marina*).**Fs**

Seaweed Community

Coarse-grained subtidal flats and bedrock ledges which support seaweed growth.

Fu

Upper Shoreface

The inner subtidal slope which extends seaward from large exposed sand beaches where sediments are actively transported by bottom currents generated by storm waves. The upper shoreface is a sandy environment of constant wave shoaling under normal wave conditions.

Fp

Lower Shoreface

The outer subtidal slope which extends seaward from the upper shoreface. The lower shoreface is affected only by currents generated by storm waves. Lower shoreface sediments grade from sand to mud in a seaward direction.

Channel Environments

Linear, intertidal and subtidal depressions carrying tidal-current water.

C1

High-Velocity Tidal Channel

Tidal channels where maximum flow velocities probably exceed 2 meters per second (mps).

C2

Medium-Velocity Tidal Channel

Tidal channels where maximum flow velocities probably attain values between 1 and 2 mps.

C3

Low-Velocity Tidal Channel

Tidal channels where maximum flow velocities probably do not exceed 1 mps.

C4

Estuarine Channel

Tidal channels where ocean and river waters mix. Estuarine water salinities range between 0.5 ppt and 30 ppt.

C5

Estuarine Flood Channel

Estuarine tidal channels where flood-tide current velocities greatly exceed velocities attained during ebb tide.

C6

Estuarine Ebb Channel

Estuarine tidal channels where ebb-tide current velocities greatly exceed velocities attained during flood tide.

C7

Inlet Channel

High current-velocity channels cut through barrier beaches and connecting back barrier estuaries or lagoons with the open ocean.

C8

Dredged Channel

Man-made, artificially-deepened or widened tidal channel.

Cs

Channel Slope

Gently to moderately sloping wall margins of large tidal channels. Channel slopes are confined to channel wall margins composed of sediment.

Cb

Abandoned Tidal Channel

Former tidal channel no longer carrying flow sufficient to erode the channel floor or margin walls. Abandoned channels usually occur in salt marsh tracts where meandering of the central drainage channel cuts off former channel segments.

Cf

Tidal Fluvial Channel

Lower portions of river channels under tidal influence but not carrying estuarine waters.

LC

Tidal Creeks

Small tidal channels draining salt marshes or intertidal mud flats.

FD

Marsh Drainage Ditch

Man-made, rectilinear ditches dug into marshes to facilitate marsh surface drainage.

W

Unit boundary.

Approximate transition boundary between estuarine and marine (30 ppt salinity) waters and between estuarine and river (0.5 ppt) waters.

Unit boundary.

Approximate unit boundary.